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❖SPORT AND PERFORMANCE

NUTRITIONAL KNOWLEDGE AND PRACTICES OF SELECTED TRACK AND FIELD COACHES AND ATHLETES

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Abstract
Aim. The study assessed sports nutrition knowledge (SNK) and practices among coaches, trainers and athletes of the CALABARZON Region who participated in the Track and Field competition during the 2012 Palarong Pambansa (National Games).
Methods.Through descriptive method the study utilized survey, interview and observation to identify the kinds of food taken by the athletes, knowledge, source of information, influence and practices and this was related to the coaches' knowledge and what role it played in giving education to the athletes.
Results show the low score of athletes and coaches in nutritional knowledge as well as the low attention the delegation provides for nutrition as manifested by lone nutritionist assigned to the whole delegation. This study is one of the few that focus on the Track and field as a discipline worth of study as far as Philippine setting is concerned.
Conclusions.The results of the study will serve as baseline data for educating coaches, trainers, athletes and other stakeholders in Athletics about nutrition and its effects on athletic performance.
Key words: Sport nutrition knowledge, track and field, coaches and athletes, policies.

Introduction

Athletics or Track and Field is the centerpiece event in every athletic competitions and it was part of the Ancient and Modern Olympic Games. It involves skills in running, jumping and throwing. In order to have better performance, athletes in the course of history used different methods believing that they will have a better performance. In the ancient times, athletes used lion's heart and deer's liver with the belief if will make them stronger and faster (Applegate & Grivetti, 1997). During the contemporary times, sport nutrition knowledge become a field of interest in Nutrition and many researchers become interested to the subject (Fink et al., 2006)

In the basic education sector in the Philippines which includes the elementary and secondary levels, athletic competition starts in school intramurals followed by district, division and regional meets which culminate in the Palarong Pambansa or (National Games). The Palarong Pambansa serves as venue for talent identification for young athletes as they progress to higher level of competition in the collegiate level.

Proper nutrition plays a vital role in maintaining the health of an athlete. Lack of these will increase the risk of poor performance and injury (Burke & Cox, 2010). In the joint statement of the International Association of Athletics Federations (IAAF), they expressed that the right food choices will help the athlete to increase their performance and expectations. Good nutrition is also the policies of the Olympic Games as seen in the ways how food was prepared in the athletes' village of the 2000 Sydney Olympics and cultural standards were considered. It was strictly monitored by sports dieticians to ensure the right nutrients in every meal served (Pelly et. al, 2009).

On the researcher's point of view, it was recognized that there are no studies that tackled nutritional knowledge and practices during the Palarong Pambansa. The author being a high school teacher and coach in Track and Field personally witnessed the different training programs and its effects that may be not be productive to the improvement of performance. Through this study it will contribute for the betterment of the overall well-being of the athlete and avoid injuries which are the result of improper nutrition. That's why the purpose of the study is to assess the sport nutritional knowledge and practices of the track and field athletes competed in the 2012 Palarong Pambansa (National Games), Philippines who belonged to the Region IV-A CALABARZON which includes the provinces of Cavite, Laguna, Batangas, Quezon and Rizal. Specific objectives are to provide baseline data of nutritional knowledge based on actual food consumption, attitudes and practices of athletes in food intake, and nutritional knowledge and practices of coaches or trainers. Also is to compare the nutritional

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knowledge and practices of athletes and coaches.

Methods

The study used descriptive method which includes using survey questionnaire, interviews and direct observation. During the whole tournament, which was held in Lingayen, Pangasinan, Philippines on 21-27-April-2012, athletes and coaches were given survey questionnaire about nutritional knowledge and practices whose content was based on the works of Burkhart (2010) and Zinn (2004). Permission was granted from both authors and because the study was done on a limited time, only through face validity by set of experts was done in order to check the questionnaire. Choices of the questionnaire are yes, no and unsure in order to avoid guessing of the respondents. Survey was given on the start of the tournament and athletes were given instructions and guided by their respective coaches in answering. The forms were retrieved on the last day of competitions. Part of the questionnaire is a 7-day food record that will indicate the kind of food the athletes taken during the tournament. Unfortunately, the food record was not competed due to lack of time of the athletes. Observation in the playing venue and mess hall was done including sending of the questions for interview to the nutritionist from Department of Education (DepEd) Region IV-A CALABARZON. The menu provided was given to an independent Registered Nutritionist-Dietician (RND) for expert opinion. Results of the questionnaire was statistically treated by a student of the University of the Philippines School of Statistics and provided the averages and other values needed for the study.

Results

There were a total of 28 respondents who participated in the study which is composed of 14 boy athletes, 9 girl athletes, 4 men coach and 1 women coach. Each of the athletes played maximum of 4 events. In terms of education background, there were 10 boys studying in public high schools and 4 from private institutions. While 4 girl athletes came from public high schools and 5 from private. In terms of the educational background of coaches, only 2 of them were graduates of Physical Education degree 1 each on specialization of behavioral science Technology and Livelihood Education and Filipino, four (4) of them taken graduate studies up to the status of "Completing Academic Requirements" or CAR.

Athletics tournament of the 2012 Palarong Pambansa was held at the Narciso Ramos Sports and Civic Center in Lingayen, Pangasinan, Philippines. Games were done on 6-11-May-2012 from 6:00AM to 9:00AM for morning session and 3:00PM till 6:00PM for afternoon session. Around the playing venue there are different stores selling food and souvenir items. It was noticed that there was a fastfood outlet inside the stadium because the it was one of the sponsors of the competition. Since this food outlet was the nearest in the playing area, there are some athletes who usually bought food in their store which includes hamburgers, hotdog sandwich, French fries and cola. Meanwhile outside the stadium, there is easy access for other food stores which includes convenience store which is located just across the sports complex.

The mess hall of the delegation of Region IV-A CALABARZON is located at the billeting center in Estancia Elementary School which is 10 kilometers away from the stadium. Jeepneys serve as mode of transportation for athletes going to the playing venue and it takes around 30 to 45 minutes under normal conditions to reach the stadium.

Before the start of the games at 6:00PM, athletes were already served their breakfast through buffet form. It was seen that athletes can get only one serving of the food per meal. As the games in the morning session ends at 9:00AM, they usually go back to their mess hall for their lunch and return to the stadium 1-2 hours before the start of afternoon session at 3:00PM. The foods were prepared according to the menu set by the designated Nutritionist-Dietician of the region. The menu used during the tournament is shown in table 1

Table no. 1- Menu during the 2012 Palarong Pambansa of CALABARZON Delegation

Breakfast	Pork Tocino (Cured Pork) w/ Tomato Fried Egg Vegetable Rice Hot Chocolate/ Milk	Burger Steak w/ Mushroom Gravy Egg Steamed Rice Hot Chocolate/ Milk	Beef Tapa (Cured Beef)w/ Red Egg & Tomato Fried Egg Fried Rice Hot Chocolate/ Milk	Daing na Bangus w (Dried Milkfish)/ Tomato Hard Boiled Egg Steamed Rice Hot Chocolate/ Milk	Corned Beef Fried Egg Steamed Rice Hot Chocolate/ Milk

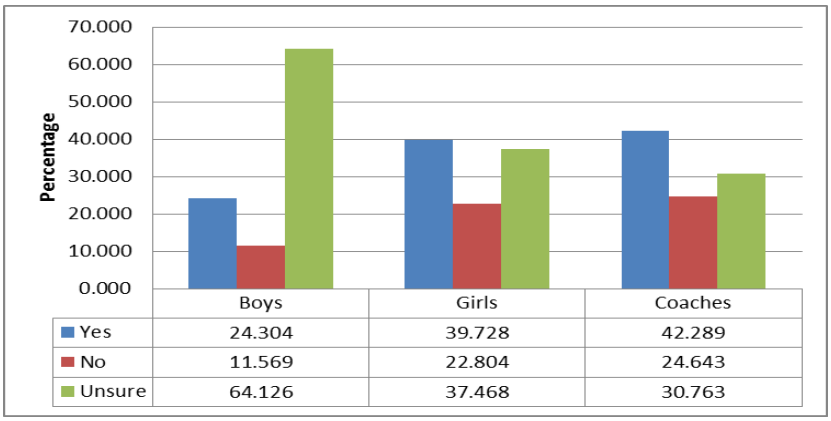
Snacks	Tuna Sandwich Juice/Iced Tea	Chicken Sandwich Juice/Iced Tea	Egg Sandwich Juice/Iced Tea	Hotdog Roll Juice/Iced Tea	Ham and Cheese Sandwich Juice/ Iced Tea
Lunch	Pork Kare-Kare (Pork with fish paste and vegetables) Fried Fish Rice Fresh Fruits	Sinigang na Bangus (Milkfish in tamarind soup) Fried Chicken Rice Fresh Fruits	Pork Nilaga (Pork meat in broth) Grilled Chicken Rice Fresh Fruits	Chicken Tinola (Chicken meat in broth) Fried Fish Rice Fresh Fruits	Sweet & Sour Fish Fillet Molo Soup(Wanton wrapper soup) Rice Fresh Fruits
PM Snack	Spaghetti & Meatballs Bread Toast Juice/ Iced Tea	Pancit Canton (Stir-fried noodles) Lumpia Shanghai Juice/ Iced Tea	Baked Macaroni Garlic Bread Juice/ Iced Tea	Pancit Bihon (Noodles) Puto (Rice cake) Juice/ Iced Tea	Spaghetti Carbonara Garlic Toast Juice/ Iced Tea
Dinner	Egg Noodle Soup Pork Menudo Lumpia Shanghai Rice Fresh Fruits	Cream of Mushroom Soup Pork Steak Sauteed Vegetables Rice Fresh Fruits	Pumpkin Soup Chopsuey Fried Tilapia Rice Fresh Fruits	Cream of Corn Soup Grilled Pork Chop Buttered Vegetables Rice Fresh Fruits	Noodle Soup Beef Caldereta Chicken Roll Rice Fresh Fruits

In the interview with the nutritionist-dietician of Region IV-A CALABARZON, she said was only consulted about nutrition 2 times in the 3 years of her tenure. Her criteria for preparing the menu are making it a balanced meal and easy preparation. Also, she noted that the budget given my DepEd was enough for the nutritional needs of the athletes and she stressed that proper nutrition is also important as those with athletic training.

The menu was independently assessed to another expert in nutrition who was a professor at the University of the Philippines College of Home Economics. According to her, she noticed the lack of variety of food in the menu as well as the high sodium content of foods as manifested by the presence of processed foods. Much more she noted the lack of servings provided and scarcity of serving of vegetables in the menu.

Upon return of the survey, results were statistically treated with the help of a student from the University of the Philippines School of Statistics. Results of the survey were grouped to knowledge in nutrients which includes carbohydrates, protein, vitamins and minerals as well as hydration. After getting the percentages on each items, the general average was obtain to get the overall nutritional knowledge of athletes and coaches. It was seen that the girls have a higher score of 39.728% as compared to boys with 24.304%. Meanwhile on the unsure answers, girls got only 37.468% while boys scored 64.126%. As for the coaches, they garnered 42.289% for correct answers 30.763% for unsure response and 24.623% for wrong answers.

(See graph no. 1)



	Boys	Girls	Coaches
Yes	24.304	39.728	42.289
No	11.569	22.804	24.643
Unsure	64.126	37.468	30.763

Figure no. 1 Overall results for Nutritional Knowledge of Coaches and Athletes

Discussions

In countries with high incidence of poverty like the Philippines, it is common to prioritize food choices through socio-economic status and budget. It is known that when the funds are not enough for food, there will be little or no choices for a particular group or family. That's why like for nursing mothers in Nairobi, Kenya, many of them lacks the nutrition needed and this can be linked to the socio-economic status of an individual (Ongosi, 2010) , (Fojas-Luna, 2001). In terms of sport nutrition policies, most of countries successful in international competitions have a great number of sport nutritionists that monitor the food intake as well the nutritional value of each meal served to the athletes. Upon personal correspondence of the author to Burkhart and Zinn, it was known that they are handling specific number of events and athletes as compared to the lone nutritionist of the Region IV-A CALABARZON who is tasked to provide the same menu for the whole delegation. This was in contrast with the nutrition policy of Athletics Ontario wherein they give great attention to nutrition as important factor for athletic performance.

As noticed earlier with the results of the overall nutritional knowledge of athletes and coaches, the difference of correct answers of coaches and girl athletes are minimal. Large part of the answers of boy athletes is unsure answers as compared to girls. The knowledge of the athlete can be link on the hours spent in training. In the most system of training for student-athletes for the Palarong Pambansa, most of the regional delegations provide training period mostly one to two months prior to the competition. In some cases there are chances that athletes are allowed to train full time three to four weeks before the event. There will be chance of not giving attention to their studies due to the set-up that athletes are excused to their classes during the whole training period. In terms of the coaches' educational status, most of them are not yet done with their graduate studies and they finished different degrees in their Bachelor's degree. There was no assurance if their respective courses tackled about sports nutrition. Mostly the scope of graduate studies in education in the Philippines is administration and supervision of schools and there were limited chances for coaches to get a graduate degree related to exercise science and nutrition.

Results of the study are in congruence that women have higher nutritional knowledge in their athletic performance (Paugh, 2005). Although in the study by Burkhart (2010) there is no big gap between male and female athletes in terms of nutritional knowledge and the same results was also seen in the study of Browning and Grioux (2010) where in fact there is a difference between gender on the questions regarding calories it is not significant to identify the different in nutritional knowledge. It is also expected that those athletes whose course is related to Physical Education has a higher nutritional knowledge as compared with students from other disciplines (Azizi et al., 2010). In other studies, when nutritional knowledge of coach, athletes, strength and conditioning specialists and dietician, it was obvious that that dieticians are having more knowledge but since the coaches are the ones easily consulted by the athletes and more focused on training (Torres-McGehee at al, 2012). Moreover, the lack of coaches' knowledge is usually seen by just using visual reference to check the weight and condition of an athletes and not using proper measurement on this matter (Overdorf at Silgailis, 2010).

It was noted earlier that the researcher tried using a 7-day food record based on Heaney (2010) but since the record was given during the competition, athletes have no time filling up the record. That's why it is suggested that future researches using this method should be given proper time including the pilot testing of the questionnaire for the nutritional knowledge. Also the study can be replicated on a more large number of athletes and coaches which may include the whole national delegation for Palarong Pambansa.

Conclusions

Based on the study and data presented, it is seen that both athletes and coaches have low nutritional knowledge as seen as well in their practices that they have limited food choices provided by the menu by the

lone nutritionist of the CALABARZON region. Mostly it was the female athletes with high regard for nutritional knowledge. It is recommended that there should be an extensive program for sport nutrition education for athletes and coaches as it was not much covered in the present curriculum in the Philippines as most athletes and coaches are mainly concern with athletic training and nutritional knowledge was set aside due to lack of opportunities for continuing education. Coaches and trainers should be provided chance to undergo graduate studies in exercise science as well as provide more nutritionist-dietician that will closely monitor the eating plan and the nutrients provided not only during the tournament itself but also during the training period.

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THE EFFECTS OF COMBINED PROGRAM (LAND- AND AQUATIC EXERCISES) ON GLIDING UNDERWATER FOR YOUNG SWIMMERS

ALIAA HELMY[1]

Abstract
Purpose. Swimming analysis on up to 200 m events pointed out that the first 15 m plays an important role in the performance result. Hence the hydrodynamic ability to glide under water in a streamline position. Should not be neglected during training, especially in young competitors. Glide in one of five important tips of training .The purpose of this study was to identify Training Program (contains land exercise and water drills. And its effect on the glide performance in (15 m) crawls and breaststrokes in young swimmers
Methods. Sample contains (30 young swimmers) dived into two groups (control group) & (experimental group) , each one 15 young swimmers male (mean ± SD , age 13 ± 1.5 years , height 166 ± 8 cm , body mass 52.3 ± 11.3 kg. Study used tests to measure gliding includes: Starting block and asked to dive and swim foe 15 m crawl CR and 15 m breaststroke (BR) in two different trails. Later subjects underwent a series of hydrodynamic tests such as : diving and gliding under water in a streamline position for 8 m (DG) , pushing off from the wall and gliding underwater position 8 m (PG) , pushing off from the wall , gilding and swimming crawl for 12.5 m (PGC) , pushing from the wall , gliding and swimming breaststroke for 12.5 m (PGB) , sculling while floating on the back for 10m (SC) . Time was recorded.
Results. There was a statistically significant between the two measures (pre &post) for the experimental group and between the two (post) measures for control and experimental groups.
Conclusions. As a result the specific exercise program has been improved performance of gliding through crawl and breaststroke for young swimmers.
Key Words: land training, aquatic training, gliding underwater.

Introduction

The use of various types of exercises in champion sports is occasionally associated with complications that contradict the main goal of physical activity, which is maintaining human health. In order to eliminate or reduce the harmful effects of heavy exercises in champion sports and to achieve highly efficient exercises. In addition , entry of Early age into intensive physical training programs was becoming a widespread phenomenon, with children as young as 5 or 6 years undergoing training programs of increasing intensity, often reaching 20±30 h á week) (Theintz, et al. 1993).

Researchers forward to finding new methods to benefit the advantages and mitigate the risks of this kind of exercises. Water-based activities (WA) in recent years have gained popularity and are considered as one of the possible alternatives among the traditional physical activities for wellbeing and health. The reasons can be linked to several factors: buoyancy reduces the effect of weight bearing on skeletal joints and reduces compressive joint forces; the larger density of water (compared to air) and the drag force (Colado, et al. 2008) provides loading during all movements; the hydrostatic pressure and the water temperature improve blood flow and favorably alter the hemodynamic responses at rest and during exercise.

Water is an environment in which almost everyone can work hard without pain, and relax at the same time. Almost everybody can benefit from aquatic exercises. Improving the performance and technical aspects of tactical of the most important factors to improve the results of swimmers, so the processes to improve technically and tactically continue through all stages of the preparation of the swimmer through training long-term or during the training of seasonal as well and the ability of the swimmer on the compatibility between the components of the race different from the distance of the start and swimming and rotation and how to focus on the primary and composite components for each of these elements. Despite the fact that there is very little research supporting the benefits of exercising in water.

Considering the paucity of research in this regard, swimming analysis on up to 200 m events pointed out that the first 15 m plays an important role in the performance result. Hence the hydrodynamic ability to glide under water in a streamline position. Should not be neglected during training, especially in young competitors. Glide in one of five important tips of

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training .The purpose of this study was to identify Training Program (contains land exercise and water drills. And its effect on the glide performance in (15 m) crawls and breaststrokes in young swimmers.

Methods

Sample contains (30 young swimmers) dived into two groups (control group) & (experimental group) , each one 15 young swimmers male (mean ± SD , age 13 ± 1.5 years , height 166 ± 8 cm , body mass 52.3 ± 11.3 kg. Study used tests to measure gliding includes: Starting block and asked to dive and swim foe 15 m crawl CR and 15 m breaststroke (BR) in two different trails. The researcher conducted on the sample homogeneity of basic research in the variables (age,height, weight, balance, strength of the flexible alarm, sliding 15 meters, sliding 12, 5 meters, 10 meters glide, glide 8 meters.

The procedures.

Training Protocol

The subjects in the aquatic experimental group and the land experimental group were given the training exercises at the same time and the same exercises with different of environment, for 12 weeks, twice a week. Each session was of 60 minutes' duration. The intensities to the training sessions was between 50 - 80%

The structure of a training session consists of:

1. Introduction - 3-5 Minutes

Explains the aim of the session, the contents of the training and the

Expectations concerning the workload according to the player's needs.

2. Warm up - 10 Minutes

Warm up can be split into general and specific parts. The purpose of the warm up is to prepare the whole organisms.

3. Main part(s) 40 Minute

Main part(s) can be split into physical and Technique parts

3.1. Physical part - 20 Minute: In the main part which is aimed to improve the

General or specific level of the physical conditions, this part included these exercises, (walking, jogging, swinging, etc.)

3.2. Technique part- 20 Minute: In the main part which is aimed to improve the general or specific level of the Technique conditions, this part included this jumps (Tuck jump - session - Pike jump- Split Leap Forward - Straddle Pike jump)

4. Cool down - 5-7 Minutes

Starting with a slow and easy jogging and followed by excellent stretching exercises.

Tools.

Balance of medical Balk to measure weight.
Ristamitr to measure length with poison.
A tape measure. - Stopwatch.
Testing facility. - Skill tests.

Physical Tests.

Balance.
The power of the two men.
Flexibility of the trunk.

Skill testing question:

15 m sliding, sliding 12, 5 meters, 10
meters glide, glide 8 m, and was 200 meters.
15 m sliding, sliding 12,5 meters, 10
meters glide, glide 8 meters, 200 meters Crawl

Equivalence among the groups

Was a parity between the Tribal measurements for the two experimental and control groups in the flexible alarm, sliding 15meters, 12,5 meter glide, glide 10 meters, 8 meters using the glide test and the Mann Whitney non barometer test.

A - Tribal measurement:

The researcher to conduct the measurement of tribal groups on the day of Friday /6/2010 and the measurement variables included the following: flexibility of alarm, the two men tested the ability - and the Balance (starting skill test for a distance of glide 15 meters, 12,5 meter glide, glide 10 meters, glide 8 meters. And measuring 200 m and 200 m was free

B - Measurement of the post:

Test the skill of starting distance on
9/7/2010.
Test the ability of the flexibility and balance 10/07/2010

Statistical analysis

All statistical analyses were calculated by the SPSS statistical package. The results were report as means and standard deviations (SD).Wilcoxon signed-rank test (non-parametric statistical hypothesis test) used to determine the differences. $p<0.05$ was considered as statistically significant.

Results

Table 1 Homogeneity of the sample

Measurements	Mean	Median	Std. Deviation	Skewnes
Age	12.64	12.6	0.86	0.14
Length	1.64	1.55	6.57	0.04
Weight	46.35	46.00	5.88	0.18
Balance	14.630	14.550	0.981	0.001
Ability	27.441	27.500	0.757	0.052
Flexibility of the trunk	23.968	24.230	0.615	0.017
Glide 15 m	9.854	9.560	0.636	0.800

Glide 12.5 m	8.096	8.140	0.511	-0.488
Glide 10 m	7.331	7.225	0.373	0.355
Glide 8 m	6.657	6.670	0.370	0.212
Brest 200m	3.202	3.200	0.036	0.267
Glide 15 m	9.866	9.855	0.537	0.125
Glide 12.5 m	8.902	8.960	0.379	0.075
Glide 10 m	7.619	7.440	0.527	0.878
Glide 8 m	6.343	6.400	0.552	-0.527
Crawl 200m	2.545	2.500	0.222	1.928

Table (1) show that the coefficient of torsion of the variables (age, height, weight, Glide 8 m و Glide 10 m, Glide 12.5 m, Glide 15 m) and Crawl 200m and (Glide 8 m, Glide 10m glide 12.5 m, Glide 15 m) and Brest 200m, and Balance, Ability of the Legs, Flexibility of the trunk ranged between (-0.527: 1.928) and these values confined between (±3) are located under the curve equinoctial indicating sample homogeneity.

Table 2 Significant differences between the measurements of the tribal groups in the experimental and control flexibility of alarm, sliding 15 meters, sliding 12,5 meters, 10 meter glide , glide 8 meters using the Mann Whitney test

Variables	Group		Average Ranks		Total Ranks		Value (U) Calculated	Level Significance
	Control group	Experimental group	Control group	Experimental group	Control group	Experimental group		
Balance	8	7	1.25	1.00	9.75	8.00	1.56	0.094
Ability of the Legs	7	8	1.25	1.50	10.00	10.50	1.47	0.124
Flexibility of the trunk	7	8	1.00	1.50	8.00	10.50	1.08	0.120
Glide 15 m	8	7	1.25	1.25	9.75	10.00	1.34	0.088
Glide 12.5 m	7	8	1.25	1.50	10.00	10.50	1.19	0.96
Glide 10 m	8	7	1.25	1.00	9.75	8.00	1.56	0.094
Glide 8 m	7	8	1.25	1.50	10.00	10.50	1.47	0.124
Brest 200m	7	8	1.00	1.50	8.00	10.50	1.08	0.120
Glide 15 m	8	8	1.25	1.25	9.75	10.00	1.34	0.088
Glide 12.5 m	7	8	1.25	1.50	10.00	10.50	1.19	0.96
Glide 10 m	8	8	1.25	1.00	9.75	8.00	1.56	0.094
Glide 8 m	7	8	1.25	1.50	10.00	10.50	1.47	0.124
Crawl 200m	7	8	1.00	1.50	8.00	10.50	1.08	0.120

Table (4) There are no statistically significant differences between measurements tribal for the two experimental and control group race Crawl (Glide 8 m, Glide 10 m, Glide 12.5 m و Glide 15 m) and Crawl 200m and (Glide 8 m, Glide 10 m, Glide 12.5 m , Glide 15 m) and Brest 200m , and Balance , Ability of the Legs , Flexibility of the trunk, as it made the differences level of significance was (0.088: 0.124), It is the largest values for the significance level that was acceptable to the researcher a level of significance 0.05, which shows the equivalence between the two groups.

Differences between pre and post measurements in the experimental group in the flexible alarm sliding 15 meters, 12, 5 meter glide, glide 10 meters, 8 meters using the glide test and Wilcoxon signed-rank test.

Table (5) Significant differences between the measurements (tribal - posttest) in the variables under consideration the control group Wilcoxon signed-rank test (N = 15)

Variables	Average Ranks	Average Ranks		Total Ranks		Value (Z)	Level
		Positive	Negative	Positive	Negative	calculated	Significance
Balance	Degree	4.00	8.29	4.00	116.0	-3.181	0.001❋❋
Ability of the Legs	Degree	6.50	8.11	6.50	113.5	-3.040	0.001❋❋
Flexibility of the trunk	Degree	0.00	8.00	0.00	120.0	-3.409	0.001❋❋
Glide 15 m	Second	0.00	8.00	0.00	120.0	-3.408	0.001❋❋
Glide 12.5 m	Second	3.50	6.94	10.50	55.5	-2.013	0.044❋
Glide 10 m	Second	3.50	6.94	10.50	55.5	-3.302	0.001❋❋
Glide 8 m	Second	0.00	7.5	0.00	105.0	-3.302	0.001❋❋
Brest 200m	Second	4.00	8.29	4.00	116.0	-3.181	0.001❋❋
Glide 15 m	Second	6.50	8.11	6.50	113.5	-3.040	0.001❋❋
Glide 12.5 m	Second	0.00	8.00	0.00	120.0	-3.409	0.001❋❋
Glide 10 m	Second	0.00	8.00	0.00	120.0	-3.408	0.001❋❋
Glide 8 m	Second	3.50	6.94	10.50	55.5	-2.013	0.044❋
Crawl 200m	Second	3.50	6.94	10.50	55.5	-2.013	0.044❋

Table (5) Shows the existence of statistically significant differences between the measurement pre and the variables race Crawl (Glide 8 m, Glide 10 m, Glide 12.5 m, Glide 15 m) and Crawl 200m and (Glide 8 m, Glide 10 m, Glide 12.5 m , Glide 15 m) and Brest 200m , and Balance , Ability of the Legs ,Flexibility of the trunk post experimental group second in the variables and for measuring the post as the value of (Z)indexed respectively (-3.181), (- 3.040), (- 3.409), (-3.408), (-2.013), (-3.302) , (-3.302) respectively (-3.181), (- 3.040), (- 3.409), (-3.408), (-2.013) and at the level of statistical significance was in a race Crawl (8 m, 10 p.m., 12.5 m, 15 m) , and the 200-meter race Crawl(0.001), and in the race was 200 meters (0.044), and all those values less than (0.05)

Table 6. Significant differences between the measurements (tribal - posttest) in the variables under consideration for the group pilot in Wilcoxon signed-rank test (N = 15)

Variables	Average Ranks	Average Ranks		Total Ranks		Value (Z)	Level
		Positive	Negative	Positive	Negative	calculated	Significance
Balance	Degree	8.00	0.00	120.0	0.00	3.408-	0.001❋❋
Ability of the Legs	Degree	8.00	0.00	120.0	0.00	3.408-	0.001❋❋
Flexibility of the trunk	Degree	8.00	0.00	120.0	0.00	3.410	0.001❋❋
Glide 15 m	Second	8.00	0.00	120.0	0.00	3.408-	0.001❋❋
Glide 12.5 m	Second	8.00	0.00	120.0	0.00	3.419-	0.001❋❋
Glide 10 m	Second	8.00	0.00	120.0	0.00	3.411-	0.001❋❋
Glide 8 m	Second	8.00	0.00	120.0	0.00	3.408-	0.001❋❋
Brest 200m	Second	8.00	0.00	120.0	0.00	3.408-	0.001❋❋
Glide 15 m	Second	8.00	0.00	120.0	0.00	3.410-	0.001❋❋
Glide 12.5 m	Second	8.00	0.00	120.0	0.00	3.408-	0.001❋❋
Glide 10 m	Second	8.00	0.00	120.0	0.00	3.419-	0.001❋❋
Glide 8 m	Second	8.00	0.00	120.0	0.00	3.411-	0.001❋❋
crawl 200m	Second	8.00	0.00	120.0	0.00	3.408-	0.001❋❋

Table (6) Shows the existence of statistically significant differences between the measurement pre and post experimental group second in the variables the variables race crawl (Glide 8 mو Glide 10 mو Glide 12.5 mو Glide 15 m) and Crawl 200m and (Glide 8 mو Glide 10 mو Glide 12.5 m , Glide 15 m) and Brest 200m , and Balance , Ability of the Legs , Flexibility of the trunk for measuring the post as the value of (Z)indexed respectively (-3.408), (- 3.408), (- 3.410), (-3.408), (-2.019), (-3.411), (-3.408), (- 3.408), (- 3.410), (-3.408), (-2.019), (-3.411),(-3.408) and at the level of statistical significance was in a race Crawl (8 m, 10 p.m., 12.5 m, 15 m) The race was 200 m and 200 m race Crawl (0.001), and all those values less than(0.05).

Table 7. Significant differences between control and experimental groups in the dimensional measurements of the variables under consideration in the Mann –Whitney (N 1 = n 2 = 15)

Variables	Average Ranks	The control group		The experimental group		Value (Z) calculated	Level Significance
		Average Ranks	Total Ranks	Average Ranks	Total Ranks		
Balance	Degree	22.87	343.0	8.13	122.0	2.00	0.00❋❋
Ability of the Legs	Degree	22.93	344.0	8.07	121.0	1.00	0.00❋❋
Flexibility of the trunk	Degree	22.9	343.5	8.10	121.0	1.500	0.00❋❋
Glide 15 m	Second	17.70	280.5	12.30	184.5	64.50	0.045❋
Glide 12.5 m	Second	21.13	317.0	9.87	184.0	28.00	0.00❋❋
Glide 10 m	Second	20.10	301.5	10.90	163.5	43.50	0.003❋❋
Glide 8 m	Second	22.87	343.0	8.13	122.0	2.00	0.00❋❋
Brest 200m	Second	22.93	344.0	8.07	121.0	1.00	0.00❋❋
Glide 15 m	Second	22.9	343.5	8.10	121.0	1.500	0.00❋❋
Glide 12.5 m	Second	17.70	280.5	12.30	184.5	64.50	0.045❋
Glide 10 m	Second	21.13	317.0	9.87	184.0	28.00	0.00❋❋
Glide 8 m	Second	20.10	301.5	10.90	163.5	43.50	0.003❋❋
Crawl 200m	Second	22.87	343.0	8.13	122.0	2.00	0.00❋❋

Table (7) Shows the existence of statistically significant differences between the measurement pre and post experimental group second in the variables race Crawl (Glide 8 m, Glide 10 m, Glide 12.5 m, Glide 15 m) and Crawl 200m and (Glide 8 m, Glide 10 m, Glide 12.5 m , Glide 15 m) and Brest 200m , and Balance , Ability of the Legs, Flexibility of the trunk for measuring the post as the value of (U) indexed, respectively (2.00), (1.00), (1.50), (64.5),(28.0), (43.5), (2.00), (1.00), (1.50), (64.5),(28.0), (43.5),(2.00), and a t the level of statistical significance was in a race Crawl (8 m, 10 m to 12.5), and in the race Crowl 15 m was (0.045) and the 200-meter race was reached (0.00), and the 200-meter race Crawl (0.003), which is statistically significant at the level of (0.05).

Table 8. Differences in the rates of improvement between pre and post measurements for the two experimental and control groups in the flexible alarm, sliding 15 meters, sliding 12, 5 meters, 10 meter glide, glide 8 meters

Variables	The control group			The experimental group			
	Before	After	Change %	Before	After	Change %	Change %
Balance	14.393	15.104	4.708	14.867	16.167	8.041	6.571
Ability of the Legs	27.300	28.133	2.962	27.583	29.433	6.288	4.417
Flexibility of the trunk	14.393	15.104	4.708	14.867	16.167	8.041	6.571
Glide 15 m	9.960	9.203	8.222	9.747	7.506	29.855	22.608
Glide 12.5 m	8.228	7.184	14.532	7.963	6.463	23.221	11.162
Glide 10 m	7.391	6.832	8.177	7.272	5.667	28.314	20.551
Glide 8 m	6.847	6.197	10.490	6.468	4.867	32.886	27.311
Brest 200m	3.203	3.189	0.460	3.201	3.129	2.323	1.918
Glide 15 m	9.953	9.381	6.097	9.779	9.002	8.635	4.214
Glide 12.5 m	8.816	8.530	3.353	8.989	7.363	22.084	15.855
Glide 10 m	7.669	7.315	4.847	7.569	6.114	23.792	19.640
Glide 8 m	6.753	6.106	10.591	5.934	4.614	28.609	32.336
Balance	2.573	2.527	1.847	2.516	2.374	5.981	6.431
Crawl 200m	14.393	15.104	4.708	14.867	16.167	8.041	6.571

Table (8) differences in the rates of improvement between pre and post measurements for the two experimental and control groups in the variables race Crawl (Glide 8 m, Glide 10 m, Glide 12.5 m, Glide 15 m) and Crawl 200m and (Glide 8 m, Glide 10 m, Glide 12.5 m , Glide 15 m) and Brest 200m , and Balance , Ability of the Legs , Flexibility of the trunk the results were as follows:

Ranged from rates of improvement for the experimental group between (2.323% to 32.886%) for the measurement posttest, and ranged from rates of improvement in the control group between (0.460%

to 14.532%) for the measurement posttest, while the range difference between the two groups in rates of improvement between (1.918% to 32.336%) in favor of the experimental group.

Discussion

The results of Table (5) an improvement, but by simple changes in the physical and skill under the control group between pre and post measurements and for dimensional measurement, and these results agree with previous studies, (G.Michielon , et al. 2006) in that the practice of the sport of swimming to help improve the skill and physical variables under consideration in general and the logical consequence of the regularity in the performance leads to improved physical abilities and skills in an appropriate manner.

It is clear from the results of Table (6) the existence of evolution and improvement in a positive and significant in the varied physical and skill under discussion for members of the experimental group and attributed the researcher to apply the training program (ground - water) on a glide under the water for swimmers emerging in question This is consistent with what was noted by many researchers.

As can be seen from the results of Tables No. (7) and (8) the existence of evolution and improvement in a positive and significant in the varied physical and skill under discussion between the experimental and control groups to measure the post and in favour of the experimental group, and it shows that the proposed training program is working to improve performance skills where Many studies have indicated that good preparation physically works to improve the level of performance skills. (Invernizzi, et al. 2006)

From the above you see the researcher that the training program (ground - water) on a glide under the water for swimmers emerging a penalty key stages of physical preparation and skill so that it exercises preparatory private and can increase the intensity of exercise, where they become exercises especially advanced by increasing the number of groups or increasing frequencies or reduce the rest period, and thus can serve the special physical qualities next to improve the level of performance skill. (Cossor & Manson, 2001)

Conclusions

In light of the objectives of the study and its results were discussed and the researcher concludes the following:

1 - Has helped the program used to improve and develop the skills and physical variables under consideration in young swimmers.

2 - Resulted in skill and physical variables under consideration by the training program (ground - water) on a glide under the water for young swimmers to improve performance skills to the level of my skills (breast and Crawl) and reduce the time of performance.

Recommendations

In light of the objectives of the study and its results were discussed and the researcher recommends:

1 - Interest in the development of skill and physical variables under consideration, and the use of the training program (ground - water) to slip under the water level of performance for the development of young swimmers.

2- Conducting similar studies in the development plan preparation for the junior swimmers.

3 - Circulate the study to sports organizations to take advantage of them.

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IMPACT OF WAVE BOARD KID ON FLEXIBILITY OF THE LOWER LIMB JOINTS AND RECORD IN BREAST AND MONO SWIMMERS

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Abstract
*Purpose***.** Through the notes one of the researchers developed the level of her son (one of the youngest swimmers from the [6]th October Club) following the use of wave board kid , which was practiced to play with in his spare time, and observing a group of movements performed during the use of wave board The impact of these movements on the joints of the lower limb and may use researchers in the scientific method of experimental check , Hence, This study aimed to identify the impact of the training program using wave board kid on flexible joints of the lower limb and record for Breast and Mono swimmers.
Methods. The sample contains sample (30) swimmers dived into three groups were two experimental groups and one control group, (10) swimmers for each group (age: 13± 5 years), height 165 ±8 cm, body mass 47±11.3 kg, was used tests flexibility of the spine (bending - the tide), and the flexibility of the knees (bending), and the flexibility of the feet (bending - tide) as tools for data collection
Results. Training using your wave board has a positive impact on the development of flexible joints of the lower limb and record level swimmers breast and mono. The existence of significant differences between pre and posttest measurement between the experimental group and control group in the post test measurement for the two experimental groups .Also became clear that the highest percentage of improvement for the 50 m , in breast swims when we use the wave board (the pre 44.25 , the post 42.02) and the improvement percentage (4.98 %) . There is an improvement in the record level in the mono (the pre 29.10, the post 27.54) the improvement percentage (5.35 %).
Conclusions. The use of training using your wave board for the development of flexible joints of the lower limb and digital level swimmers breast and mono. Concern for the development element of flexibility within the aqueous medium to influence the level of achievement for young swimmers.
Key Words: Wave Board, Lower Limb Joint, Mono Swimmers.

Introduction

The world of extreme sports is constantly evolving. A current trend that has been attracting young adults is street surfing, which described as the combination of surfing, snowboarding and skateboarding. Two brands in particular, the Wave board and the Ripstik, are attracting riders.
The Wave board is manufactured by a company called Street Surfing, and was first introduced in 2004. The Razor Co. introduced its own caster board variation, the Ripstik, in 2006. Both brands come in several styles and new models are being developed that offer attractive and innovative features.
Wave boarding is one of the most exciting sports around; it is growing in popularity at a phenomenal rate around the world.
The Wave is a new, very unique riding system. It's easier; the board rides on two wheels, each on a pivot so that the board can turn freely. Each wheel is below a foot pad, and the pads are linked with a pivot that turns, rather than hinging like a snake board. This whole setup, the Wave, is fun to use and feels very natural once you get the hang of it. That might take a little bit, but it's a great new experience
Through the notes one of the researchers developed the level of her son (one of the youngest swimmers from the [6]th October Club) following the use of wave board kid , which was practiced to play with in his spare time, and observing a group of movements performed during the use of wave board The impact of these movements on the joints of the lower limb and may use researchers in the scientific method of experimental check , Hence, This study aimed to identify the impact of the training program using wave board kid on flexible joints of the lower limb and record for Breast and Mono swimmers., through identify the following sub-aims:
Differences between pre and post measurement for each group separately.
Differences between the posterior measurements for the three groups (two experimental and control group).
Differences in improvement between the three groups.

Methods

The sample contains sample (30) swimmers dived into three groups were two experimental groups and one control group, (10) swimmers for each group

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(age: 13± 5 years), height 165 ±8 cm, body mass 47±11.3 kg, was used tests flexibility of the spine (bending - the tide), and the flexibility of the knees (bending), and the flexibility of the feet (bending - tide) as tools for data collection.

Data collection tools

6 Measurements were used, age and height and weight was also used tests include the flexibility and elasticity of the spine (bending - tide) and the flexibility of the knees (bending), flexibility of the feet (bending - tide) were also measured 50-meter pool for each group as tools for data collection.

Procedures

Use of children and adults Panel skiing in their various forms in order to play and recreation sports without knowing the effects of health and physical, which returns their fitness and flexibility of their joints and agility movements, and There are many names and forms boards including those used in this study is called a wave board kid and is described as a small board made of fibreglass, metal or plastic or wood in the form of slides more smoothly and durability, mounted on wheels of reinforced plastic, called polyurethane, used mainly in the sport of skiing. And performed them from movements such as the revolving motion back and front, the movement of the heart skateboard, movement and 8) reverse the wave board, movements, the rise in the air, the movement of skiing on two-wheeler background, movement down the stairs of vertical and horizontal movement of the coup 360 degrees, and the movement of standing on the surface of the board hand, movement and touch the bottom of the wave board. Movement skiing cylinder, and which have been utilized in the development of the exercises used in the search experience. It was a harmony between the research basic sample and a number (30) swimmer in the variables age, height, weight and flexibility of the spine (bending - tide) and the flexibility of the knees (bending), flexibility of the feet (bending - tide), and it became clear that basic sample is located below the curve equinoctial ± 3 which shows harmonization the sample.

Training Protocol

Subjects underwent (8) weeks - three weekly total training (24) each time training and training (90) minutes and a time of flexibility within the training module (20) minutes total (480) minutes. And the first experimental group (swimmers released) has been trained on Sunday, Tuesday and Thursday, while the second experimental group (swimmers mono) trained on Sunday, Monday and Wednesday, as the control group were trained and the training followed to be followed on Mondays, Wednesday and Thursday.

Equivalency

Tribal measurements for the three groups (two experimental and control group) have been implemented and compare them using the Friedman test barometer and found out no statistically significant differences among them in the tests under discussion which shows the equivalence between them.

Measurements

Measurements of the tribal groups in the three 18.6.2011 have been implemented as dimensional measurements were performed after (8) weeks of measurement in the tribal 08.18.2011 subject to the same conditions which it has been tribal measurement.

Statistical Analysis

All statistical analyses were calculated by the SPSS statistical package. The results are reported as means and standard deviations (SD). Differences between two measurements were reported as mean difference ±95% confidence intervals (mean diff ± 95% CI). Z-test and Chi-square was used to determine the differences in fitness parameters between the measurements. The $P<0.05$ was considered as statistically significant.

Results

Table 1 the mean scores in Spine flexibility, Knees flexibility, Feet flexibility**,** and 50. M breast for the first experimental group

Statistical variables		No. of ranks		Average ranks		Total ranks		Value Z	Statistical significance
Record		Negative	Positive	Negative	Positive	Negative	Positive		
Spine flexibility	Tend	1	9	2.00	2.00	2.00	18.00	2,87-*	0.002
	Tide	2	8	1.00	1.50	2.00	12.00	2,69-*	0.001
Knees flexibility	Tend	1	9	2.00	2.50	2.00	22.50	2.88-*	0.003
Feet flexibility	Tend	1	9	4.50	3.00	4.50	27.00	2.49-*	0.001
	Tide	1	9	2.50	3.00	2.50	27.00	2.76-*	0.040
50. M breast		1	9	2.00	3.00	2,00	27.00	2.94-*	0.003

The Z-test showed significant differences between pre- and post-training scores for all variables (P≤ 0.05) for the post-training.

Table 2 the mean scores in Spine flexibility, Knees flexibility, Feet flexibility, and 50. M Mono for the second experimental group.

Statistical variables		No. of ranks		Average ranks		Total ranks		Value z	Statistical significance
Record		Negative	Positive	Negative	Positive	Negative	Positive		
Spine flexibility	Tend	2	8	1.50	2.00	3.00	16.00	-2.61*	0.010
	Tide	2	8	2,50	3.50	5.00	28.00	-2.82*	0.011
Knees flexibility	Tend	2	8	2.00	2.00	4.00	16.00	-2.49*	0.020
Feet flexibility	Tend	2	8	1.50	3.50	3.00	28.00	-2.67*	0.001
	Tide	2	8	2.50	2.50	5.00	20.00	-2.91*	0.005
50. M Mono		2	8	2.00	2.50	4.00	20.00	-2.86*	0.004

The Z-test showed significant differences between pre- and post-training scores for all variables (P≤ 0.05) for the post-training.

Table 3 The mean scores in Spine flexibility, Knees flexibility, Feet flexibility**,** and 50. M swims for the control group

Statistical variables		No. of ranks		Average ranks		Total ranks		Value Z	Statistical significance
Record		Negative	Positive	Negative	Positive	Negative	Positive		
Spine flexibility	Tend	3	7	1.50	2.50	4.50	17.50	-2.34*	0.042
	Tide	4	6	1.00	3.00	4.00	18.00	-2.48*	0.031
Knees flexibility	Tend	4	6	1.00	2.00	4.00	12.00	-2.66*	0.029
Feet flexibility	Tend	3	7	1.50	2.50	4.50	17.50	-2.44*	0.041
	Tide	4	6	1.00	3.00	4.00	18.00	-2.68*	0.002
50. M swims		4	6	1.50	3.50	6.00	21.00	-2.57*	0.003

The Z-test showed significant differences between pre- and post-training scores for all variables (P≤ 0.05) for the post-training

Table 4. Friedman analysis of variance for the sign of the differences between the posteriori measurements of the three sets Flexibility in the tests in question

Tests		Statistical variables	Groups		
			Breast swimmers	Mono swimmers	Control
Spine flexibility	Tend	No. of groups	3		
		Average ranks	5.23	4.25	3.59
		Degrees of freedom	2		
		Chi-square	16.58		
		The critical value	0.00		
	Tide	No. of groups	3		
		Average ranks	6.18	5.82	3.84
		Degrees of freedom	2		

Tests		Statistical variables	Groups		
			Breast swimmers	Mono swimmers	Control
		Chi-square	24.48		
		The critical value	0.001		
		No. of groups	3		
		Average ranks	3.97	3.14	2.79
Knees flexibility	Tend	Degrees of freedom	2		
		Chi-square	17.55		
		The critical value	0.00		
		No. of groups	3		
		Average ranks	6.61	5.28	4.10
	Tend	Degrees of freedom	2		
		Chi-square	12.36		
Feet flexibility		The critical value	0.002		
		No. of groups	3		
		Average ranks	4.51	4.02	3.15
	Tide	Degrees of freedom	2		
		Chi-square	42.38		
		The critical value	0.001		
		No. of groups	3		
		Average ranks	5.42	5.12	3.20
5o.m swim		Degrees of freedom	2		
		Chi-square	23.15		
		The critical value	0.001		

• The value of (Ca 2) when tabular degrees of freedom 2 = 5.99 Alpha

Table 5 Differences in rates of improvement among the three groups in the tests in question

Groups		Breast swimmers			Mono swimmers			Control group		
Tests		Pre	Post	Change %	Pre	Post	Change %	Pre	Post	Change %
Spine Flexibility	Tend	7.50	6.35	15.3	7.60	6.50	14.5	7.50	7.70	2.67
	Tide	23.1	26.3	14.0	23.2	26.4	13.8	23.2	23.6	1.72
Knees flexibility	Tend	11.3	9.23	15.3	11.4	9.5	16.7	11.3	11.0	9.09
Feet Flexibility	Tend	28.4	30.1	5.9	28.2	29.8	5.67	28.3	28.6	1.06
	Tide	34.6	37.5	8.38	34.5	37.4	8.41	34.5	34.9	1.16
5o. M swims		44.2	42.1	4.98	28.7	26.9	4.65	47.1	46.2	1.91

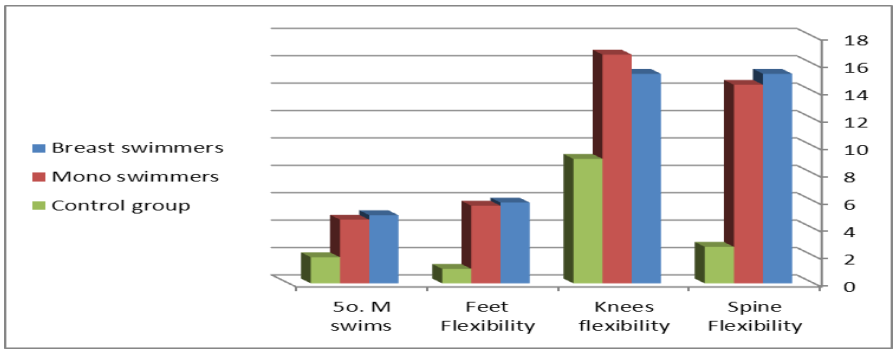

Fig 1. Show the Differences in rates of improvement among the three groups in the tests in question

Discussion

Shows a table (1.2) there are significant differences between the measurements pre and post experimental group first by using board skiing for swimmers breaststroke and mono in the tests of flexibility and 50 m was under consideration for the measurement posttest, and returns the researching of these results to the positive effect of using the board skiing on the development of an element of flexibility t to the joints of the lower breaststroke and mono swimmers. As shown in a tables (4.5) there are significant differences between the measurements a posteriori tests flexibility under discussion for the three groups for the measurement posttest for swimmers breaststroke , followed by swimmers mono, where it became clear the existence of differences in rates of improvement among the three groups ranged between (4.98% to 18.3%) for the experimental group I (swimmers chest), and ranged between (4.65% to 16.70%) for the experimental group II (swimmers mono), while ranging between (1.06% to 9.09%) for the control group, which shows the improvement trend in favor of measurement posttest for swimmers chest followed by swimmers mono.

The researchers return these differences to influence the positive board to the use of skating on the development of an element of flexibility to the joints of the lower end of the swimmers breast and mono.

- The movements that performed by swimmers using your skiing exercises are difficult to design for its development where the bend the knee, and ankle flex and bend in the timing of the trunk during one movement where the exercises are difficult to apply to these combined.
- That all the performed by board Characterized by the balance and continuation at the same time leads to the work of muscles difficult to design exercises work them.
- The movements of the board used contraction both still and moving at the same time.

And agree all with (D.K. Mathews, 1978; F. Verducci 1980; A. Muhammad, and M. Ahmed. 2010) provides that flexibility is the range of motion around the joint and it is measured in degrees and it depends on factors physiology associated with muscles and joints that have an impact on fitness physical and performance skills.

Agree with (K. Mustafa, et al. 2010) on the flexible joints shoulders and feet to have an impact on the results of swimming and the rest of the flexible joints. These results also agree with the results of studies of both (S. Amal, 1999), Z. Adel, 2002) T. victor, 2002)

Conclusions

The use of training using your wave board for the development of flexible joints of the lower limb and digital level swimmers breast and mono. Concern for the development element of flexibility within the aqueous medium to influence the level of achievement for young swimmers.

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THE EFFECTS OF CORE STRENGTH TRAINING (WITH AND WITHOUT SUSPENSION) ON LIPID PEROXIDATION AND LUNGE SPEED FOR YOUNG FENCERS

AMR HAMZA[1]

Abstract
*Purpose***.** Core strength has been subject to research since the early 1980s. The research has highlighted the benefits of training these processes for people with back pain and for carrying out everyday activities. However, less research has been performed on the benefits of core training for elite athletes. Hence, the purpose of this study was to investigate the effects of two types of the core training (with sling and without sling) on Malondialdehyde (MDA), Creatine kinase (CK) as markers to lipid peroxidation, physical variables (core strength test, static strength and dynamic strength) and lunge speed for young fencers.
*Methods***.** Eighteen young fencers (mean ± SD age, 13.2 ± 1.9 years. High, 149.64 ± 6.31 cm. Weight, 47.22 ± 5.77 kg. Training experience 5.12 ± 2.05 years), all participations divided into equally into (3) groups (two experimental groups -12 young fencers) and (control group -6 young fencers) from the Alexandria fencing club, the first experimental group performed the core strength training with the sling which contain (Swiss ball and body weight exercises) for (10) weeks , the second experimental group performed the core strength training without sling which contain (Swiss ball and body weight exercises) for (10) weeks and the control group practiced the traditional training only. The data collected from urine and blood, and lunge speed test by using off camera 100 frames / second). Physical abilities tests (core strength test, static strength and dynamic strength) before and after the programs for the three groups. All participants were fully informed about the aims of the study, the procedures and the training, and gave their voluntary consent before participation. The experimental procedures were in agreement with the ethical human experimentation.
*Result*s. Statistical analyses showed that there was a significant difference between the two groups in the lung speed test only for the experimental group with the suspension. And there is no significant difference between the two experimental groups in biochemical & physical variables, the improvement in both.
Conclusions. Finally, Core strength training, for 10 weeks, resulted in an increase in physical variables (core strength test, static strength and dynamic strength) and lung speed, and decreases the urine Malondialdehyde (MDA), and increased of Creatine kinase (CK) for young fencers .These results have to be taken into account by coaches in order to better understand and implicated of these concepts for technical effects of training.
Key Words: Core strength training, Sling, Malondialdehyde, Creatine kinase, young fencers.

Introduction

Fencing competition is held in three forms of blades, foil, epee and sabre. The foil and epee are more commonly used regionally. Both are dull with a pair of small wires that run from the handle to the tip, where there's a button. The object is simple; touch your opponent hard enough for the button to be pushed and you receive a point. The first to either five or 15 points, depending on the game, wins. The customary "en guard" position varies with the weapon, but is generally a partial squat position with the forward foot perpendicular to the back foot. The most common attacks are ballistic movements initiated from the "en guard" position, with the weapon arm in extension for a thrust or a cut, depending on the weapon. Advances and retreats are performed while maintaining the partial squat of the guard position. Defense is accomplished by evasion, retreat, and parrying the opponent's weapon with contact and pressure from the defender's blade. (Rippetoe, 2000).

Fencing sport is required of skill, speed, and power. Skill is improved by long years of practice and experience under the guidance of expert coaching. Traditionally, Fencers need specific parts of all the physical qualities to succeed in competition and to prevent them from getting injured. With greater levels of strength and agility fencers find 'explosive' lunge movements and getting around the piste easier, All the training is designed to progress individuals so the type and intensity of fitness training done with our fencers is dependent on the individual level and age of the fencers involved in the sessions. As such training might be introductory, general, and (relatively) easy for the novice fencers, or they might be designed to be very tough and very fencing specific for elite fencers (with everything in-between) (Rippetoe, 2000). However, the days are gone when elite competitors in any strenuous

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sport can rely on the practice of sport skills as their sole source of conditioning. Resistance training, or more specifically a correctly resistance training program, is the choice of athletes all over the world, regardless of sport, for the development of the strength necessary to compete at the elite level. As the athlete rises through the competitive ranks, the first and easiest improvements occur as the athlete achieves the success facilitated by natural talent for the sport and the conditioning provided by the practice of sport skills. Eventually even the most talented people reach the point where progress comes only through increased intense training, eventually approaching the limit of potential. The percentage of potential achieved and the rapidity of its achievement are functions of training efficiency (Ibrahim, 2010).

Competitive fencers can obviously benefit from an increase in strength. Stronger muscles can be faster muscles (Dengel, 1987; Fox, et al. 1987). Studies have shown increases in contraction speed when weight training was used in conjunction with sport skill practice (Dengel, 1987). Improved sprint performance subsequent to weight training demonstrates the application of strength to speed production (Delecluse, 1997).

Power is the application of force with respect to the time of application. In a practical sense, power is the ability to apply maximum force in a minimum amount of time, the ability to recruit the maximum number of motor units in a muscular contraction, or the ability to "explode". This concept is tremendously important to all combative sports where contact with an opponent, even indirectly through a fencing weapon, is involved. Attacks and parries are effective only if they transmit sufficient force through or to the opponent's weapon. The muscles involved with the extension, the grip, the parries, as well as all ground-reaction activity, e.g. lunge, ballestrae, advance and retreat, etc., benefit from an increased ability to generate power. Power production can be enhanced by both increasing absolute strength and through the use of explosive exercises that specifically develop power (Hakkinen, et al. 1989), and will be addressed in the recommended program.

In general, to produce movement in fencing the muscles must produce strength, or to produce fast movement, the fencer must use a well-trained nervous system to activate this force production from the muscle. As such strength underlies almost all physical tasks.

Training for strength is normally thought of as something that stereotypical strength athletes. However, there are numerous types of strength training with only one type designed to 'get big', these are generally categorized as: Strength-endurance training (associated with muscles working under fatigue), Hypertrophy training (associated with growth and getting big), Maximal strength training (associated with strength increases without growth), and Power/Explosive strength training (associated with fast powerful movements). Fencers should aim to become well-conditioned enough to train explosive strength and strength endurance. (Amr, 2008)

Classic literature classified the musculature of the core as being controlled by "local" and "global" muscular systems (Bergmark, 1989). The "local" system consists of all the muscles that originate and insert at the vertebrae, with the exception of the psoas muscles which flex the hip joints (Bergmark, 1989). The role of the "local" system is to control the curvature of the lumbar spine, aid in the coordination and control of motion segments, and provide sagittal and lateral stiffness to maintain mechanical spinal stability (Bergmark, 1989). On the other hand, the "global" system acts to transfer forces from the thoracic cage and the pelvis out to the extremities. The muscles of the "global" system have longer moment arms of force, as well as larger cross-sectional areas than the muscles of the "local" system, making them ideal for force production (Arokoski, et al., 1999).

Balance and stability are very important parts of sports and athletic performance (Cook, 2003), especially in fencing sports (Osama, 20008). Sling exercises to develop the core strength are one of the most used training methods to develop speed, power and balance in athletes. When performing sling training the balance is defined as maintaining a position with no movement for a certain time (Dudgeon, et al. 2011). An individual with good stability have a greater possibility to develop force from extremities than a person with inferior stability (Cook, 2003). One of Suspension Training (ST) fundamental principles is to challenge balance to force the individual to work more with his/her stability (Norwood, et al. 2007). Core stability in athletes has in later years shown to influence performance. Training on gym balls has shown good results for core stability but not for sport specific performance (Fitness Anywhere, 2010). Studies with similar sling training equipment as the (ST), for example Red Cord, have shown to increase strength, stability and sport specific performance.

Suspension Training (ST) is a relatively new mode of exercise that uses the exerciser's own body weight as resistance. Suspension training employs an assortment of upper and lower body exercises which all require the individual to maintain balance while performing the various exercises (Dudgeon, et al. 2011).

Suspension Training (ST) based training concept developed by Randy Hetrick, a former US Navy Seal. (ST) makes it possible to work out in confined spaces and in the absence of a gym. The training concept is based on three different fundamental principles: vector-resistance, stability and pendulum. The vector-resistance principle gives opportunity to adjust resistance by angle to the ground, lever and gravity. The stability principle comes into play due to a base of

support and balance, and the pendulum principle due to the starting position in relation to the anchor point (Fitness Anywhere, 2010). To date no research has examined the effects of ST training. Thus, the general purpose of the study was to examine if exercises performed with ST can activate muscles involved, in power development, to a similar extent as the muscles involved in the Hang Clean exercise.

Suspension Training (ST) has been demonstrated to be beneficial as part of the intervention for patients also with pelvic girdle pain after pregnancy (Stuge, et al. 2004). Regarding the treatment of patients with chronic WAD who have unsettled insurance claims, it has been argued that such a situation may influence the treatment outcome and/or the natural course of WAD in a negative way (Cassidy, et al. 2000; Holm, et al. 1999). One large insurance company (Gjensidige NOR) in Norway, starting in 1999, offered a new rehabilitation programme for patients with long-term WAD. It consisted of clinical evaluation and a treatment programme (New Sling Exercise Therapy, NSET) which included TP treatment plus a new exercise approach using sling exercises.

This exercise is performed while the pelvis or lower extremities are suspended in a sling. Exercises can be made easier using a sling and elastic cord to offset body weight or made more difficult using an unstable surface to perform the exercises (HyungKyu, et al. 2012). Research shows that sling exercises improve patient strength and proprioception by giving progressive loading using a close kinematic chain (Dannelly, et al. 2011). In particular, this exercise is reported to minimize the use of global muscles without pain while activating local muscles (Saliba, et al. 2010).

Single leg training is not two leg squats. Although the two legs squat are good, it doesn't sufficiently train "the single leg" component. The single leg component can provide massive levels of balance and proprioceptive work which have been shown to reduce injuries. The two legs squat, because it's done on two legs, does not require as much proprioceptive work. (HyungKyu, et al. 2012)

To our knowledge, sling exercises have not been used in previous studies of fencing sport. And the Traditional strength training is usually done with dumbbells, barbells and free weight plates. These can be used for a multitude of exercises such as squat, deadlift, lunge, bench press, shoulder press and many others. In later years, Core strength training has been given a lot of focus and has led to the development of new training equipment, such as sling training. We experienced promising results with the use of sling exercise in selected fencers. In addition, some fencing coaches in Egypt more attention to the development of the physical demands of the sport of fencing alongside the development of skills, based on these words (the best training for fencing is fencing itself). These words may be true, when we observed the foot work in fencing, we will find it similar exercises Plyometrics. but may result in a feeling of the players are bored to repeat the daily performance where the focus is on muscle groups specific may lack integration muscular performance, hence the importance of diversity in the use of forms and types of training used and the Force career, which is a key requirement for the performance of motor skills in both movements, advances and retreats, challenge, since the performance of these motor skills requires a performance strength and speed without disruption in the balance, to change the status of the weight of the body down while diversity in the performance of these skills.

However excessive resistance training program may increase oxidative stress and cellular damage (Liu, et al. 2005). And, the formation of free radicals results in lipid peroxidation during aerobic exercise which may cause cell and muscle damage. Malondialdehyde (MDA) has mostly been used as an end-product marker of lipid peroxidation (D. Bailey, et al. 2010). MDA levels during exercise are correlated with creatine kinase (CK) which is an indicator of muscle damage (Guzel, et al. 2007). Thus, the aim of the present study was to compare the effects of two types of the core training (with sling and without sling) on Malondialdehyde (MDA), Creatine kinase (CK) as markers to lipid peroxidation, physical variables (core strength test, static strength and dynamic strength) and lung speed for young fencers.

Methods

Eighteen young fencers (mean ± SD age, 13.2 ± 1.9 years. High, 149.64 ± 6.31 cm. Weight, 47.22 ± 5.77 kg. Training experience 5.12 ± 2.05 years), all participations divided into equally to (3) groups (two experimental groups -12 young fencers) and (control group -6 young fencers) from the Alexandria fencing club, the first experimental group performed the core strength training with sling which contain (Swiss ball and body weight exercises)for (10) weeks , the second experimental group performed the core strength training without sling which contain (Swiss ball and body weight exercises) for (10) weeks and the control group practiced the traditional training only. The data collected from urine and blood, and lunge speed test by using off camera 100 frames / second). Physical abilities tests (core strength test, static strength and dynamic strength) before and after the programs for the three groups. All participants were fully informed about the aims of the study, the procedures and the training, and gave their voluntary consent before participation. The experimental procedures were in agreement with the ethical human experimentation.

Procedures

Collection of blood and urine samples

Subjects provided fasting blood samples before the choline supplement and after one week. A blood sample (3 ml) was collected in an EDTA-containing Vacutainer tube and centrifuged at 4°C at 3000×g for 10 minutes. The plasma was decanted and frozen at - 70°C prior to analysis. Subjects also collected their urine for the subsequent five-hour

period. The urine was kept refrigerated during the collection period. Urine malondialdehyde (MDA) were measured by a fluorometric assay and visually-read colorimetric assay.

The Core Muscle Strength & Stability Test (CMST)

The objective of this evaluation is to monitor the development and improvements of an athlete's core strength and endurance over time.

Flat surface

Mat

Watch or clock with second counter

Conducting the Test

Position the watch or clock where the player can easily see it

Start in the Plank Exercise Position (elbows on the ground). Hold for 60 seconds

Lift right arm off the ground. Hold for 15 seconds

Return right arm to the ground and lift the left arm off the ground. Hold for 15 seconds

Return left arm to the ground and lift the right leg off the ground. Hold for 15 seconds

Return the right leg to the ground and lift the left leg off the ground. Hold for 15 seconds

Lift left leg and right arm off the ground. Hold for 15 seconds

Return left leg and right arm to the ground.

Lift right leg and left arm off the ground. Hold for 15 seconds

Return to the Plank Exercise Position (elbows on the ground). Hold this position for 30 seconds

Static strength test (LS) (BS)

A back dynamometer was used to measure the static leg strength. The subjects stood on the dynamometer platform and crouched to the desired leg bend position, while strapped around the waist to the dynamometer. At a prescribed time they exerted a maximum force straight upward by extending their legs. They kept their backs straight, head erect and chest high. 3 trials were allowed to the subjects and the best score was taken. Subjects had a rest between the trials.

Standing Long Jump Test (SLJ):

The subject stands behind a line marked on the ground with feet slightly apart. A two foot take-off and landing are used, with the swinging of the arms and bending of the knees to provide forward drive. The subject attempts to jump as far as possible, landing on both feet without falling backwards. Three attempts are allowed.

Seated Medicine Ball Throw (SMBT):

The subject stands with their back to a wall, on a mat facing the area to which the ball is to be thrown, and with the feet extended and slightly apart. The ball is held with the hands (two hands) on the side and slightly behind the center. The ball is brought to the chest, and then thrown vigorously out as far as possible. The back should remain in contact with the wall at all times. Three attempts are allowed. The distance from the wall to where the ball lands are recorded. The measurement is recorded to the nearest 10 cm. The best result of three throws is used.

Dynamic balance test (DBT):

Tools used

A belt of rubber introduced 3 cm from the plastic clip is installed in the middle of the back of a piece of sponge square 10 × 10, thickness 3 cm.

Powder "Badra" magnesium bicarbonate "Manezia."

Roll of adhesive plaster Showing 2 cm.

A rectangular piece of 20 × 20 cm from the carpet pile with a medium.

Meters measure the "bar.

Performance specifications

Turn around 360 on the submitted one foot (10 - consecutive sessions) at a rate R/W, from a standing position opened, arms aside, followed by stability 2s - and then walks in a straight line a length of 4 meters, fixed on the ground with a strip of plaster display 2 cm.

Turning around "360 degrees" to an author one foot (10 - consecutive sessions) at the session / s from a standing position opened, arms aside, followed by stability 2s then worked 5 handspring forward in quick succession on a selected line tape Blaster 2 cm on the ground long 4 meters, ending the development stand.

Instruction of the test

The deviation is measured in a straight line 4 meters to the right or left hand while walking to end, so that the distance is measured in centimetres from a straight line to the middle of the distance between the two editions of "thumb" feet on the ground.

Deviation measured during five consecutive handspring fronts and ended the rapid development of stand on the straight line, and along the "4-meter" so that the distance is measured in centimetres from a straight line to the middle edition of "fingerprint" square piece of sponge on the ground during handspring.

Evaluation is the extent of deviation from the straight line during the walk as well as during handspring as an indicator of dynamic balance.

Core Strengthening Protocol

The overload principle advocated in sports medicine is a nemesis in the back. In other words, the progressive resistance strengthening of some core muscles, particularly the lumbar extensors, may be unsafe to the back. Functional progression is the most important stage in the core-strengthening program. A thorough history of functional activities should be taken to individualize this part of the program.

The researcher adopted the application of core strength training on the following:

- That the focus is on strengthening the muscles and the stability of the centre
- At the end of the module extend the training given for muscle relaxation in order to return to normal.
- Training method used, you see a high intensity training system using a ring.
- Loads within the circuit training are through the change between the time of performance and comfort between the exercise and also between groups.

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- The circuit includes (5) exercises in the (3-5) groups.

Statistical analysis

All statistical analyses were calculated by the SPSS statistical package. The results are reported as means and standard deviations (SD). Differences between the three groups were reported as mean difference ±95% confidence intervals (meandiff ± 95% CI). ANOVA-test for samples was used to determine the differences in fitness parameters, urine and blood samples between the three groups. The $p<0.05$ was considered as significant statistically.

Results

Table 1. Mean ± SD, change rate and "F" sign. Among the three groups in SLJ, SMBT, DBT, CMST (LS), (BS), (Urine MDA), (CPK) and Performance speed of Lunge

Variables		Experimental group With sling			Experimental group Without sling			Control group			F sign
		Before	After	Change %	Before	After	Change %	Before	After	Change %	
SLJ(cm)		177.32 ±2.34	183.14 ±3.02	3.43	176.57 ±2.09	181.82 ±2.11	2.97	176.81 ±2.09	178.11 ±2.11	0.74	**Sign**
SMBT (meter)		5.78 ±0.38	5.99 ±0.56	3.63	5.81 ±0.39	5.87 ±0.47	1.03	5.76 ±0.41	5.81 ±0.45	0.87	**Sign**
DBT (cm)	Deviation to the right(A)	8.74 ±1.64	6.63 ±1.90	31.92	9.02 ±1.84	7.78 ±2.01	13.75	9.11 ±1.74	8.91 ±1.85	2.20	**Sign**
	Deviation to the left (A)	10.36 ±1.75	8.85 ±2.01	14.58	10.40 ±1.81	9.01 ±1.92	13.37	10.43 ±1.73	9.79 ±2.01	6.14	**Sign**
	Deviation to the right(B)	11.76 ±2.02	9.67 ±2.41	17.77	11.55 ±2.31	9.12 ±2.15	23.37	11.62 ±2.11	10.73 ±2.06	7.66	**Sign**
	Deviation to the left (B)	11.89 ±2.74	9.97 ±2.86	16.15	12.18 ±2.70	10.36 ±2.77	14.94	11.97 ±2.53	11.36 ±2.40	5.25	**Sign**
CMST (Degree)		5.66 ±0.16	7.77 ±1.34	37.30	5.31 ±0.23	7.23 ±0.94	36.16	5.20 ±0.56	5.86 ±0.78	12.70	**Sign**
LS (KG)		55.14 ±3.84	59.19 ±3.94	6.87	54.68 ±3.71	57.31 ±4.11	4.81	55.02 ±3.86	56.39 ±4.03	2.49	**Not Sign**
BS (KG)		37.51 ±4.26*	45.22 ±3.79	20.55	38.05 ±4.22	43.25 ±3.71	13.67	37.98 ±3.95	40.36 ±3.48	6.27	**Sign**
Urine MDA (Mmol /L)		10.14 ±1.36	9.41 ±1.87	7.20	10.18 ±1.22	9.73 ±1.74	4.42	10.11 ±1.34	10.03 ±1.19	0.79	**Sign**
CK (umol/L)		182.55 ±16.32	197.64 ±17.84	8.27	184.42 ±15.34	198.64 ±16.71	7.71	181.90 ±15.24	183.28 ±17.32	0.76	**Sign**
Lunge Performance speed (frame)		0.36 ±0.03	0.30 ±0.07	16.67	0.37 ±0.03	0.32 ±0.06	13.51	0.37 ±0.04	0.35 ±0.07	5.41	**Sign**

The F-test showed that

Statistically significant differences between the pre and post measurements in the experimental group (with sling) in all physical – biochemical variables and Lunge Performance speed except leg strength test (LS) , and the improvement rate between 3.43% to 36.16%

Statistically significant differences between the pre and post measurements in the experimental group (without sling) in all physical – biochemical variables and Lunge Performance speed except leg strength test (LS) and the improvement rate between 1.03% to 37.30%

Not Statistically significant differences between the pre and post measurements in the control in all physical – biochemical variables and Lunge Performance speed except leg strength test (LS) and the improvement rate between 0.74% to 12.70%

Statistically significant differences between the post measurements for the three groups in all physical – biochemical variables and Lunge Performance speed except leg strength test for the experimental group (with sling)

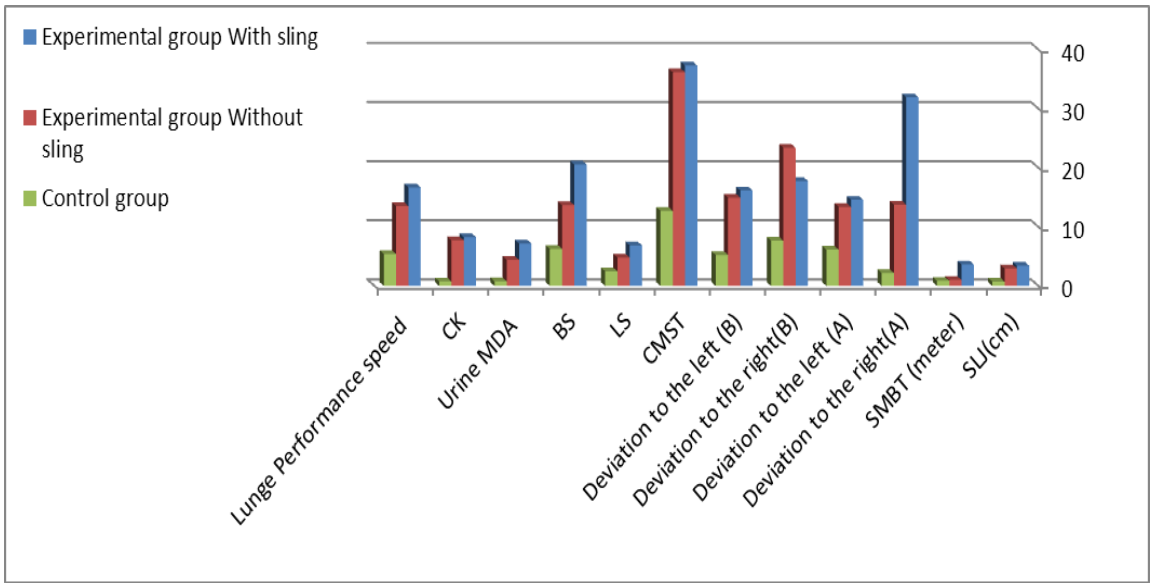

Fig 1 shows the improvement among the three groups.

Discussion

This study aimed to explore effects of two types of the core training (with sling and without sling) on Malondialdehyde (MDA), Creatine kinase (CK) as markers to lipid peroxidation, physical variables (core strength test, static strength and dynamic strength) and lunge speed for young fencers. The results of the present study showed that the young fencers in two experimental groups performed better in all tests. Compared to the control group, Indeed, in a previous study has found larger muscular activation when training with free weights (OKC) in regards to training in a smith machine (CKC), this suggests that lesser stability gives a greater muscular activation (Schwanbeck, et al. 2009). No significant difference in muscular activation has been found in training on stable versus unstable surface, though the difference has been seen between concentric- and isometric activation and for maximal voluntary contraction (MVC) when comparing training on stable or unstable surface (Anderson, Behm, 2004). Sling training is defined as CKC and has shown great improvements in stability Prokopy, et al. 2008).

According to (Daruosh , et al. 2012) Several studies have indicated that following exercise, levels of lipid peroxidation and muscle-damage markers such as MDA and CK increase , but these increases seemed to be evoked only when participants performed at maximal intensity and not at lower intensities .

And refers (Vasankari, et al. 2001) to be characterized by free radicals-old short, making it difficult to measure but can be inferred from the existence and lineage by identifying the ratios Almalon bilateral Aldehyde MDA in the blood or urine . And had explained (Sn. Meydani, M. Hayek, 1992) that can be measured by TBARS in urine as a sign of the free ions. And this oxygen is material and extensive destruction super oxide resulting from escaped electron It is well known that during physical training increases maximum oxygen consumption from 10 to 20 twice (35 to 70 ml / Kg of weight / min) as well as the be free radicals resulting from flight oxygen increasingly, this has been mathematically estimate the amount of oxygen during training and that have the ability to free radical formation as follows: 0.6 x 3.5 ms l / Kg / minute and athletic training earns the player the necessary adjustment to reduce the levels of free radicals that contribute to the speed of fatigue

According to (Daruosh , et al. 2012) after training, CK peaks about 12-24 hrs post-exercise, with the increases in range from 100 to 600 IU, whereas after high-force eccentric exercise the increase does not begin until about 48 hours post exercise, with peak activity (generally 2000-10000 IU) occurring about 4 to 6 days post exercise. The current findings confirm that the resistance exercise can result in the formation of free radicals. These free radicals may play a role in the adaptation of the muscle tissues to the physiological stress caused by resistance exercise. Ischaemia-reperfusion during resistance exercise at the site of muscle, and post-exercise production of free radicals via oxidative burst from neutrophils, are key factors that must be taken to account while trying to decrease the muscle injury during this type of exercise.

Conclusions

Finally, Core strength training, for 10 weeks, resulted in an increase in physical variables (core strength test, static strength and dynamic strength) and lung speed, and decreases the urine Malondialdehyde (MDA), and increased of Creatine kinase (CK) for young fencers .These results have to be taken into account by coaches in order to better understand and implicated of these concepts for technical effects of training.

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EFFECTS OF CIRCULAR STRENGTH TRAINING SYSTEM ON BONE MINERAL DENSITY AND KICKS PERFORMANCE FOR YOUNG SOCCER PLAYERS

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Abstract
Purpose. Circular strength training (CST) was pioneered by Scott Sonnon, and continues to build on his insights to evolve an ever more refined, coherent, cohesive and comprehensive approach to becoming a movement specialist. CST has rapidly emerged as a leader among the premier training modalities in the health / fitness and strength / conditioning arenas. The purpose of this study was to investigate the effects of circular strength training system on bone mineral density and kicks performance for young soccer players
*Methods.*Twenty young soccer players were randomly allocated to receive either a 10-week intervention of the Circular strength training system which contain (intuitive flow, Prasara Flow Yoga and Clubbell swinging) (n = 10) and a control group receiving 10-week of normal training only (n = 10). The data collected from (DEXA instrument, physical tests and Performance level tests of kicking) before and after the program for the two groups.
*Results.*Statistical analyses showed that there was a significant difference between the two groups in BMD and BMC of the lumbar spine (L2, L3, L4), the femoral regions of the kicking leg, neck (F.N), Trochanter (TROCH), Strength and power tests and kicking distance kicking accurate for the experimental group.
Conclusions. Finally, circular strength training, for 10 weeks, resulted in an increase in bone mineral density and kicks performance for young soccer players. These results have to be taken into account by coaches in order to better understand and implicated of these concepts for technical effects of training.
*Key words***:** Circular strength training, bone mineral density, young soccer players.

Introduction

Soccer is possibly the most widely practiced sport in the world by children. Few sports are played on as large a playing field, lasting as long and without regular rest periods. It involves several sprints, which evoke high mechanical stress on lower-limb bones, particularly due to the high ground-reaction forces elicited during sprinting (Freychat, et al. 1996). The latter combined with the forces generated during jumping and kicking may confer excellent osteogenic properties to soccer, as suggested by some cross sectional studies carried out with adult soccer players (Mohammed, 1992).

Quality and health of bone depend on the regularity in practicing physical activities as well as a type of this activity; so that the study of biological responses of regular sport training on health and quality of the skeleton in athletes is one of topic contribute in raising the levels of sport achievement. The importance of bones comes in as it is the general structure of body surfaces of the muscle fusion areas in the body, in addition to its important role in protecting the soft tissues and it is a big store of calcium and phosphorus. Bones are a life tissue needs food which receives rich blood vessels as need exercise especially strength training to help good growth process although the exercises are not related to bones length, the width and bones increasing by precipitation of more salts to be more strong as bones affected by stress and pressure (Mufti, 1998).

Weight-bearing physical activity has beneficial effects on bone health across the age spectrum. Physical activities that generate relatively high intensity loading forces, such as plyometric, gymnastics, and high-intensity resistance training, augment bone mineral accrual in children and adolescents. Further, there is some evidence that exercise-induced gains in bone mass in children are maintained into adulthood, suggesting that physical activity habits during childhood may have long-lasting benefits on bone health. It is not yet possible to describe in detail an exercise program for children and adolescents that will optimize peak bone mass, because quantitative dose-response studies are lacking. However, evidence from multiple small randomized, controlled trials suggests that the following exercise prescription will augment bone mineral accrual in children and adolescents:

In soccer, strength training plays a major role. It requires a balance of explosive power and muscular endurance. Some players may benefit from increasing their lean mass but even they should focus on converting much of their strength into a soccer-specific power.

Strength training for soccer also helps to correct muscle imbalances. Soccer players in particular are prone to developing overly strong quadriceps in

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relation to their hamstrings and a well-formed strength plan can address this and prevent future injury (Gioftsidou, et al. 2006).

(Mohammed, 1992; Abul Ela; 1984) indicated that muscle strength is one of the physical attributes important for sports and special games friction such as football and develop longer need to access the individual with a high level and muscle strength is not only a physical attributes but are the most important physical attributes upon which to develop other qualities such as speeding, endurance, agility and flexibility. (Mufti, 1998) adds that muscle strength and one of the dynamic factors of motor performance and importance lies in that it greatly influential on the speed of motor performance and motor skill proficiency required and is an important cause of progress performance. And also (Aweys, 2000) explain that muscle strength is a physical attributes that contribute to a prominent role in the mastery and development of tactical skill and performance and have a significant role in highlighting the emergence of some other physical attributes. In soccer, good maximal strength is beneficial for holding off opponents and shielding the ball. More importantly it also forms the foundation of muscular speed and power.

Finally, at the very heart of becoming the great soccer athlete that can run fast, cut quickly, jump high and reduce the likely hood of injury is strength training and power training. Old school thinking like, we cannot strength train because it will slow my athletes down or get my soccer athletes too big is flawed and outdated.

The soccer players need the lower body strength is required for kicking, jumping, and tackling, twisting and turning and also forms the foundation for explosive speed. And the Upper body strength is required for shielding the ball, holding off opponents, throw-ins and also contributes to the overall power and explosiveness.

One of the methods which used to improve the muscular endurance is circular strength training (CST) which pioneered by Scott Sonnon, and further developed by his elite Faculty Coaching Staff, CST is the cutting edge of health, fitness and sports performance enhancement. It's unique among fitness systems in offering a complete "health first" approach. Other systems place function (attributes like strength, endurance or speed) first, valuing those things over and often at the expense of health.

Circular Strength Training is made up of three "wings" or sub-disciplines. Though they can and are practiced independently, the three wings of CST integrate seamlessly into a stand-alone health and fitness system.

Intu-Flow is an incrementally progressive system of dynamic joint mobility exercises designed to feed and lubricate your joints and connective tissues and restore all of your joints to their full, healthy range of motion. Beginning CST athletes start with the Intu - Flow, and long term athletes use it to release stored tension, speed recovery from training, and to maintain the health and longevity of their bodies.

Prasara yoga takes the range of motion and co-ordination that you recovered with the Intu - Flow to the next level. It transforms physical performance by teaching one how to re-integrate the breath, movement and structure—the key to accessing flow state in any activity. Prasara specifically focuses on the releasing of chains of tension throughout the body. Tension caused by fear, anxiety, trauma, habit, and even exercise are pulped and released through the practice of Prasara yoga. Prasara works in the opposite and teaches you to release this habitual tension. Paired with the Intu-Flow, Prasara will give the ability to strut around the stage and contort yourself in a freakish display of athleticism while holding a note and making it look easy.

Clubbell Athletics is the third weighted wing of CST. Unlike machines, free weights, and Kettlebells, the Clubbell was specifically designed to be moved in three dimensions, just as people move in the real world. Clubbell allow one to develop the rotary and angular strength of the prime movers (translating directly to athletic performance in any activity), to develop selective tension (the ability to apply exactly the right amount of force for the task at hand, rather than the "full on/full off" approach of traditional strength training), and to develop incredible grip strength and stamina. Clubbell Athletics is simply the most sophisticated, fun and creative vehicle for strength and conditioning ever conceived. (Ryan, 2011)

CST provides a technique to cover every factor of an individual's remedial, fitness, and sports performance.

According to the above, and from believe of the researcher that, strong muscles should carry on strong bone. Hence, The purpose of this study was to investigate the effects of circular strength training system on bone mineral density and kicks performance for young soccer players.

Material and Methods

Experimental approach

Two groups (control and experimental) performed a pre- and post-training designed intervention in which the (power: vertical jump test (VJ), standing long jump test (SLJ), seated medicine ball throw (SMBT), (Static strength: leg and back strength (LS-BS) by Dynamometer), (Dynamic strength: A barbell and free weights were used to measure dynamic strength to the legs and arms), kicking tests (KT) was recorded. And Bone mineral density (BMD) in g/cm2 of the 2nd 3rd and 4th lumbar vertebral bodies (LS) and the left hip (neck of femur, FN and Trochanteric region, FT) was measured in each subject by dual energy X-ray Absorptiometry (DEXA) using a Norland Densitometer (Norland Inc.,. USA). Scan analysis was performed by technicians with daily experience in DXA analysis. The experimental group completed a CST program (10) weeks, 3 times a week, to see whether this type of training modality would have a positive, negative, or no effect on VJ, SLJ,

SMBT, and SS. Validity and reliability were assessed using a coefficient of variation on pretest measures. A good level of validity reliability was observed.

Participants

Twenty elite young tennis athletes (13.95 ± 1.87 years old; 161 ± 6 cm height; and 60 ± 5.1 kg weight) were randomly allocated to receive either a 10-week intervention of CST (n = 10) or a control group receiving 10-week of normal training only (n = 10). The training experience of all the participants ranged from 3 to 5 years. Subjects and coaches were required to read and complete a health questionnaire that collected detailed that confirmed that there was no history of injuries, diabetes or recent surgery.

Training Protocol

A 10-week in-season training program consisted of a set of Intu-Flow movements followed by a series of Prasara yoga and Clubbell exercises. All sets of the exercise were with a recovery of 60 seconds/set. This was followed by a 1-minute rest before performing all set of the matched exercise.

Procedures

Subjects were assessed before and after an 10-week training program Tests followed a general warm-up that consisted of running, calisthenics, and stretching.

Vertical Jump Test: The subject stands by their side touching a wall and reaches up with the hand closest to the wall. Keeping the feet flat on the ground, the point of the fingertips is marked or recorded. This is called the standing reach height. The athlete then stands away from the wall, and leaps vertically as high as possible using both arms and legs to assist in projecting the body upwards. They attempt to touch the wall at the highest point of the jump. The difference in distance between the standing reach height and the jump height is the score. The best of three attempts is recorded.

Standing Long Jump Test (SLJT): The subject stands behind a line marked on the ground with their feet slightly apart. A two-foot take-off and landing is used, with the swinging of the arms and bending of the knees to provide forward drive. The subject attempts to jump as far as possible, landing on both feet without falling backwards. Three attempts are allowed.

Seated Medicine Ball Throw (SMBT): The subject sits with their back to a wall on a mat facing the area to which the ball is to be thrown with their feet extended and slightly apart. The ball is held with the hands on the side and slightly behind the center. The ball is brought to the chest, and then thrown vigorously out as far as possible. The back should remain in contact with the wall at all times. Three attempts are allowed. The distance from the wall to where the ball land is recorded. The measurement is recorded to the nearest 10 cm. The best result of three throws is used.

Static strength test (LS) (BS)

Leg and back Dynamometer was used to measure the static leg strength. The subjects stood on the Dynamometer platform and crouched to the desired leg bend position, while strapped around the waist to the Dynamometer. At a prescribed time they exerted a maximum force straight upward by extending their legs. They kept their backs straight, head erect and chest high. 3 trials were allowed to the subjects and the best score was taken. Subjects had a rest between the trials (Jensen & Fisher).

Dynamic strength test (DST)

A barbell and free weights were used to measure dynamic strength. A suitable starting weight, close to, but below the subject's estimated maximum lifting capacity was selected. If one repetition was completed, the experimenter added weight to the barbell until the subject reached his maximum capacity. Both legs were tested.

The weight increments have been usually 5, 2 and 1kg during the period of measurement (Mcardle / Katch / Katch 1981).

The performance levels of kicking

- Kicking distance.
- Kicking accurate.

Statistical Analysis

All statistical analyses were calculated by the SPSS statistical package. The results are reported as means and standard deviations (SD). Differences between two groups were reported as mean difference ±95% confidence intervals (mean diff ± 95% CI). Student's t-test for independent samples was used to determine the differences in fitness parameters between the two groups. The $P<0.05$ was considered as statistically significant.

Results

Table 1. The differences in physical- skill tests and Measurements of bone density in the experimental group.

Variables	Experimental			T sign
	Pre	post	change%	
Power				
Vertical Jump Test (VJ) (cm)	25.25 ±2.31	29.16 ± 2.12	31.06	Sign
Seated Medicine Ball Throw Test (SMB)(m)	5.23 ± 0.16	5.92 ± 0.24	13.19	Sign
Standing Long Jump Test (SLJ)(m)	1.70 ± 0.11	1.79 ± 0.1	5.29	Sign
Static Strength				
Leg strength (LS) (kg)	43.53 ± 4.1	50.11 ± 4.3	12.12	Sign
Back strength (BS) (kg)	38.53 ± 4.3	44.11 ± 4.7	14.48	Sign
Dynamic Strength				
Biceps Curl Test (BC)(kg)	21.31 ±2.17	26.12 ± 3.11	22.57	Sign
Bench Press Test (BP) (kg)	30.44 ± 4.52	38.02 ± 5.12	24.90	Sign
Dynamic Knee Extension Test (DKE) (kg)	29.63 ± 3.12	33.39 ± 4.02	12.69	Sign
Leg Press Test (LP) (kg)	50.78 ±2.91	59.67 ± 3.94	17.51	Sign
Level performance of kicking				
Instep Kicking distance (IKD) (m)	17.99±2.14	22.03 ± 2.67	22.46	Sign
Instep Kicking accurate (IKA) (d)	4.11 ± 0.68	5.02 ± 0.94	22.14	Sign
Measurements of bone mineral				
BMD. F.N (g/cm^2)	0.945± 0.04	0.989± 0.03	4.66	Sign
BMD. TROCH o (g/cm^2)	0.866± 0.05	0.881± 0.06	1.73	Sign
BMC. F.N (g/cm)	5.73± 0.55	6.41± 0.89	11.87	Sign
BMC. TROCH (g/cm)	5.67± 0.77	6.03± 0.93	6.35	Sign
BMD (L2-L4)	0.821± 0.08	0.909± 0.1	10.72	Sign
BMC (L2-L4)	25.07± 2.77	28.42± 3.15	13.36	Sign

(Cm = centimetre, m = meter, kg = kilogram, d = degree, g/cm^2 = gram/ $centimeter^2$, g/cm = gram/ centimetre)

The T score showed significant differences between the pre-and post-training for all variables in the experimental group. ($P \leq 0.05$). Improves ranged between 1.73% to 24.90%

Table 2. The differences in physical- skill tests and Measurements of bone density in the control group.

Variables	Control			T sign
	Pre	Post	change%	
Power				
Vertical Jump Test (VJ) (cm)	23.99 ±2.43	24.97 ± 2.73	4.09	Sign
Seated Medicine Ball Throw Test (SMB) (m)	5.25 ± 0.18	5.35 ± 0.32	1.90	Not Sign
Standing Long Jump Test (SLJ) (m)	1.72 ± 0.09	1.74 ± 0.1	1.16	Not Sign
Static Strength				
Leg strength (LS) (kg)	44.09 ± 4.21	45.11 ± 4.41	2.31	Not Sign
Back strength (BS) (kg)	38.68 ± 3.97	40.39 ± 4.1	4.42	Sign
Dynamic Strength				
Biceps Curl Test (BC)(kg)	20.88 ±2.17	22.55 ± 2.75	8.00	Sign
Bench Press Test (BP) (kg)	31.11 ± 3.74	32.15 ± 4.07	3.34	Sign
Dynamic Knee Extension Test (DKE) (kg)	29.72 ± 2.85	30.25 ± 3.11	1.78	Not Sign
Leg Press Test (LP) (kg)	51.11 ±3.04	52.36 ± 3.12	2.45	Not Sign
Level performance of kicking				
Instep Kicking distance (IKD) (m)	18.11±2.17	19.22 ± 2.19	6.13	Sign
Instep Kicking accurate (IKA) (d)	4.36 ± 0.54	4.88 ± 0.61	11.93	Sign
Measurements of bone mineral				

BMD. F.N (g/cm^2)	0.941± 0.06	0.947± 0.07	0.64	Not Sign
BMD. TROCH (g/cm^2)	0.867± 0.07	0.869± 0.08	0.23	Not Sign
BMC. F.N (g/cm)	5.68± 0.85	5.80± 0.89	2.11	Not Sign
BMC. TROCH (g/cm)	5.83± 0.91	5.92± 0.97	1.54	Not Sign
BMD (L2-L4)	0.822± 0.08	0.829± 0.1	0.85	Not Sign
BMC (L2-L4)	25.15± 2.34	25.87± 3.02	2.86	Not Sign

The T score showed significant differences between the pre-and post-training in (VJ) , (BS) , (BC) , (BP) , (IKD) , (IKA) for the post-training. (P≤ 0.05) , and no significant differences between the other variables , Improves ranged between 0.23% to 11.93%

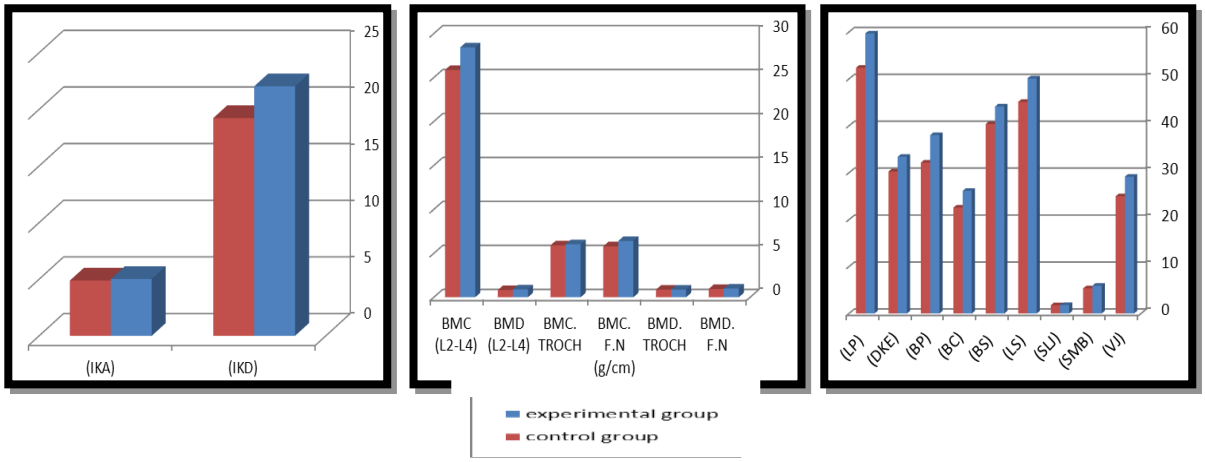

Fig 1 shows the differences in physical- skill tests and Measurements of bone density between the control group and experimental group

Table 3. The differences in physical tests in the experimental group.

Variables	Experimental	Control	T sign
Power			
Vertical Jump Test (VJ) (cm)	29.16 ± 2.12	24.97 ± 2.73	Sign
Seated Medicine Ball Throw Test (SMB) (m)	5.92 ± 0.24	5.35 ± 0.32	Sign
Standing Long Jump Test (SLJ) (m)	1.79 ± 0.1	1.74 ± 0.1	Sign
Static Strength			
Leg strength (LS) (kg)	50.11 ± 4.3	45.11 ± 4.41	Sign
Back strength (BS) (kg)	44.11 ± 4.7	40.39 ± 4.1	Sign
Dynamic Strength			
Biceps Curl Test (kg)	26.12 ± 3.11	22.55 ± 2.75	Sign
Bench Press Test (kg)	38.02 ± 5.12	32.15 ± 4.07	Sign
Dynamic Knee Extension Test (kg)	33.39 ± 4.02	30.25 ± 3.11	Sign
Leg Press Test (kg)	59.67 ± 3.94	52.36 ± 3.12	Sign
Level performance of kicking			
Instep Kicking distance (m)	22.03 ± 2.67	19.22 ± 2.19	Sign
Instep Kicking accurate (d)	5.02 ± 0.94	4.88 ± 0.61	Sign
Measurements of bone mineral			
BMD. F.N (g/cm^2)	0.989± 0.03	0.947± 0.07	Sign
BMD. Tro (g/cm^2)	0.881± 0.06	0.869± 0.08	Sign

BMC. F.N (g/cm)	6.41± 0.89	5.80± 0.89	Sign
BMC. Tro (g/cm)	6.03± 0.93	5.92± 0.97	Sign
BMD (L2-L4)	0.909± 0.1	0.829± 0.1	Sign
BMD (L2-L4)	28.42± 3.15	25.87± 3.02	Sign

The T score showed significant differences in all variables between the post-training in the two groups (experimental and control) to the experimental group. ($P \leq 0.05$)

Discussion

This study aimed to explore the effects of circular strength training (CST) on muscle strength , muscle power , Level performance of kicking and bone mineral in young soccer players. Compared to control group, young soccer players in the experimental group performed better in all tests.

The results of the present study showed that the experimental group in general, have more muscle strength , muscle power than the control group, Previous studies in female and male soccer players showed similar results. Indeed, in a previous study it was found that young female soccer players had significantly higher concentric and eccentric peak torque of the thigh muscles than controls (Soderman , et al. 2000). In another study, while young male soccer players conventionally or resistance-trained showed higher values of isokinetic concentric and eccentric strength of the lower limb extensor and flexor muscles of the knee joint of the dominant and non-dominant limb than non-soccer players (Iga , et al. 2009).

Intu-Flow is indeed one of the most revolutionary exercises. In fact, it's one of the best exercise programs that medical professionals refer out to their clients constantly . It's because an adaptation of strength training program, a Cardio program, a stretching exercise program . And thousands of men and women of all ages are regaining pain-free range of motion and healthy joints – and they're doing it naturally, without supplements, pills, "magic potions," gadgets, gizmos, or outrageous gurus. And Clubbell exercises are a new form of training designed around the concept of centre of mass (COM). Therefore, it seems that the Clubbell exercises are a way to increase strength over a particular range of motion (ROM) exercise. The concept behind Clubbell exercises is circular strength. Supposedly, the ancient Persians used to have strong men's competitions using heavy clubs. Circular strength is also described as a full range of motion strength training using multiple joint movements. Now the theory behind this has some significance for soccer players. Clubbell exercises seem to increase some of the following aspects of soccer players training:

- Increased wrist strength
- Increased upper body strength
- Increasing muscular endurance
- Increasing strength in a particular ROM
- Increasing core body strengths

Clubbell exercises can help soccer players in a whole array of ROM type activities, such as kicking power (especially through the hips), stronger arms, shoulders, ABS , parks and back for a greater throwing distance. Stronger wrist strength can help with catching the ball etc.

Moreover, our results showed that the experimental group in general, has more bone mineral density (BMD) , and bone mineral content (BMC) than the control group

Cross-sectional studies suggest that physical activity promotes greater bone deposition in children than in adults (Cooper, et al. 1995; Kannus, et al. 1995; Vuori, et al. 1994). Weight-bearing activities increase bone mass more than nonweight-bearing activities in weight-loaded skeletal regions (Calbet, et al. 2001; Nordstrom, et al. 1998). Most of the studies relating to bone mass enhancement in pre- and peripubertal children have been carried out with female gymnasts, but there are some dealing also with boys (Daly, et al. 1999; Lima, et al. 2001). Ground reaction forces during gymnastic participations are close to 10 times body mass in prepubescent gymnast boys (Daly, et al. 1999). This high-impact loading during gymnastic training has been associated with significantly greater bone mineral density (BMD) for the whole body (Cassell, et al. 1996), spine, and legs (Nickols, et al. 2000). Also, longitudinal case-control studies support the view that exercise increases bone mass (Nickols, et al. 2000).

Conclusions

Finally, circular strength training, for 10 weeks, resulted in an increase in bone mineral density and kicks performance for young soccer players .These results have to be taken into account by coaches in order to better understand and implicated of these concepts for technical effects of training.

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STUDY ON MODEL OF GAME FOR GREAT PERFORMANCE IN VOLLEYBALL AND ELEMENTS OF PROGRESS

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Abstract
Need knowledge of the game and the current model of development trends, is an essential requirement for specialist must harmonize and design training content, depending on the essential elements of the game's top teams worldwide value and in accordance with the actual availability of potential biomotric their technical and tactical players and teams.
In this context, the analysis of the current game at peak performance teams participating in qualifying tournaments and world championships, with implications for the future of game design, player and training, we draw several trends, of which we speak dedicated team of formula is 5T 1 R, are launched into a very low number of changes to the reserve players (except libero player) or tactical play aspect that is designed to the smallest detail, missing improvisations time particularly unprepared
Hypothesis. We can talk about specialization player positions and areas of maximum efficiency for attack, block and retrieval, which is done on a broad background of training in the majors, all with a special motric labor, with nervous consumption. Current level of play, the expression realization of options, which gave endorsement practice efficiency and allowed generalization beyond the strict context of the team.
Method. For comparative analyzes of various parameters of models of game and player characteristics, we proceeded to use methodological tools that experts recommend it for this purpose. At the basis of the work, stays a rich analysis of information material, studied and consulted and their views and experiences shared by many specialists and technicians, with extensive work in performance volleyball players.
Discussion. Modernization is a complex process of reconsideration, the revaluation of all that still proves valuable performance and introducing innovative elements with value and performance validated by practice .. Modernization is not a simple act, but it is a complex and continuously interacting with many implications between all elements of the structural and functional basis of democratic institutions and coach-athlete relationship, and to redefine the objectives, content modification training and game adequacy competitive system methodologies and organizational framework performance.
Conclusions. Putting in accordance with current and future requirements of performance volleyball players, volleyball Romanian require the need for continuous improvement and modernization, not by simple additions or selection of knowledge, but through a restructuring of the entire system performance, the position of systems theory, which and gives a high degree of efficiency
Key words: model, play, performance, progress.

Introduction

Study attempts to identify issues as comprehensively the entire range of components of the game and player models, the current peak performance requirements as landmarks content and methodology, for which to strive, as a whole, the entire Romanian coach, connection elements foreshadowed in the model is crucial condition in delivering Romanian unitary conception of play, training and player model.
Knowing the efficiency of each player's contribution than others to achieve the game, is of major importance for both technician and for sport (Şerban, 1999)
The indices of efficiency and economy, in which objectifies sports activities game, knows a interest in growing, they constitute benchmarks to which is conjugated efforts of coaches and players cues that tend to grow, players increase efficiency index from 0.54 to 0,65 (Ioniţă, 2007).
Analyzing tournament games Olympic team hopefuls in terms of quantitative and qualitative values, which the team as a whole and separate players, they realized the evolution of a game that stands between quantitative values (weight) and qualitative (efficiency) there is a report of determination in which the value of adverse opposition is of crucial importance (Ghenadi et. al., 1995). The value of the efficiency is higher, the quantitative values are lower, expressing a good indicator of economy in game (Mârza, 2006).

Further progress upward, can be designed and built without a correlated approach, integrating all the

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components performance volleyball players, from human resources (athletes, technicians), scientific (research, methodology, medicine, psychology, etc..) technical materials and the organization (specialized units competitive systems) to the intimate process of preparation and training technology (programming, methods and means, control, guidance, assessment, etc.).

Modernization is a complex process of reconsideration, the revaluation of all that still proves valuable performance and introducing innovative elements with value and performance validated by practice (Cojocaru, 2007). Modernization is not a simple act, but it is a complex and continuously interacting with many implications between all elements of the structural and functional basis of democratic institutions and coach-sport relationship, and to redefine the objectives, content modification training and game adequacy competitive system methodologies and organizational framework performantial (Bompa, 2003)..

Hypotheses

Somatic, biological and motive potential of players, in which the parameters - age, height, point of impact of the ball on attack and blocking - is increasing across team;

the efficiency of game actions, for the dominant specialization line and all other action games, mark growing values (especially due to the elimination of wrong actions).

Method of research

For comparative analyzes of various parameters of models of game and player characteristics, we proceeded to use methodological tools that experts recommend it for this purpose. At the basis of the work, stays a rich analysis of information material, studied and consulted and their views and experiences shared by many specialists and technicians, with extensive work in performance volleyball players.

In preparing this paper, we used these methods:

- the method of bibliographic study;
- the method of observation;
- the method of modeling and analogy;
- the experimental methods
- specific entry method effectiveness of the game;
- statistical and mathematical method for calculating the efficiency indices;
- graphical method.

Results

Knowledge and contribution of each player's performance than others to achieve the game, is of major importance for both the technician and for athlete.

The indices of efficiency and economy, in which objectifies game activity athletes, meets a growing interest from larger, they constitute benchmarks to which coaches and players combine efforts.

Analyzing tournament games Olympic team hopefuls in terms of quantitative and qualitative values, which the team as a whole and separate players, their made in the evolution of a game, it points out that between quantitative values (weight) and qualitative (efficiency) there is a determination report in which the value of the opposition side has a decisive importance. The higher the value the higher the efficiency, the quantitative values are lower, expressing a very good indicator of economy.

Whereas, in the concatenation game structures, actions have their own weight and effective weight-dependent qualitative value of the previous action, we will analyze each action game values in the context of qualifying matches to make comparative assessments, essential design game model and training, for which representative teams to guide future work.

Construction attack

Premise that bring increased efficiency of combinative organization compared to simple assault, based solely on the strength and effectiveness of shooters, is also found in the world's top teams, the tendency to maximize the share of one of the options, depending on its practical efficiency and may not generalize an option that permanently applied to find in the game.

Since the principle of maximum efficiency with minimum effort devoted combination attack based on participation to completion in 3 successive times (time) of all players, regardless of linkage and shooters in the field, it is useful to analyze practice team game for to examine whether the theoretical premises of this option combination can be improved or amended by other practical solutions.

The competition results are a criterion for validating the effectiveness of any action, we believe that there is a significant correlation between organizational option combination or slow attack and athlete outcome itself.

What can be easily found in record game analysis (table no. 1) is significant weight accomplishes leading teams in combinative completed during 1 and 2, compared to what our teams actually performed under championship game internal opponent team the opposition is much diminished value and service acquisition efficiency achieved thresholds that would allow construction lifter combination of attack, a higher percentage.

Regardless of the complexity of the attack and the construction to which the aim is to capitalize by creating superiority in action, the player who completes (Drăgan, 2002).

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Zone	4	4~3	3	3~2	2	Total actions
Spiker						
T 1	10,3~15%	24,6~37%	20,5~31%	11,9~17%	0,11~2%	67,38~74%
T 2	2,42~18%	2,85~21%	2,95~25%	4,4~33%	0,67~25%	14,5~13,3%
T 3	4,66~43%	1,74~16%	2,06~24%	0,64~5,4%	1,01~9,6%	10,5~11,5%
Total	**18,1~19%**	**29,1~32%**	**26,4~29%**	**16,4~18%**	**1,90~2%**	**91,3~100%**
Middle blocker						
T 1	0,27~0,3%	5,44~5,8%	35,5~38%	49,4~53%	2,20~2,9%	92,8~81,1%
T 2	1,14~13%	0,16~1,4%	1,23~11%	0~0%	7,98~73%	10,81~9,44%
T 3	1,71~15%	0,11~1%	4,54~42%	1,01~10%	3,45~32%	10,82~9,4%
Total	**3,44~3%**	**5,74~5%**	**41,3~36%**	**50,5~44%**	**13,7~12%**	**114,3~100%**
Opposite						
T 1	0,32~0,4%	8,11~9,5%	17,3~20%	42,4~49%	16,4~19%	85,10~64,3%
T 2	0,90~2,5%	2,35~6,3%	22,7~61%	4,06~10,7%	7,06~19%	37,10~27,6%
T 3	1,7~14%	0,37~3%	2,99~24%	0,95~8%	6,87~56%	12,51~9,15%
Total	**2,68~2%**	**10,7~8%**	**42,9~32%**	**48,2~36%**	**29,4~22%**	**134,5~100%**
Total average	**24,22~7,12%**	**44,54~13,09%**	**110,6~32,51%**	**115,1~33,84%**	**45~13,23%**	**340,1~100%**

Table 1 - Share of attack distribution

That, in the conditions of taking over at higher efficiency, completion is done mostly in extreme areas of the net length, is evidence of the attack simplest organization, requiring specialists, amplifying concerns for adequate training of organizational design combination of attack as the premises theoretical maximum efficiency in organizing attacks require completion of.

Analyzing the structure and mechanism combinations in attack teams top priority orientation viability was found to completion of on time 1 (T1), in the center of the net, a high-speed lift and surprise completion time 2 (T2) players of line 1 or 2 on a lift with parameters close to those of the time 1, so that the organization can no longer lock be opportune.

On time 3 (T3) for completion (our teams use players priority area 4, or at the line 2 in zone 1 or 6) the tendency is to perform the attack in line 2, the coordinates attack in T2 and one in T3, safety player is allocated most efficiently, wherever they are found on land.

Guiding idea in choosing solutions is that of alternating combinations, the timing of completion of the players nominated for various times and trajectory lifting surfaces is completed, a principle that leads us to the conclusion establish dominant areas for completion, depending on the organization poor and lower efficiency in a specific area of blockage adverse (**table nr. 2**)

Table 2 - Distribution attack completion of with the setter to all land areas

ZONE	**4**			**3**			**L 2 / Z 6**			**2**			**L 2 / Z 1**			**TOTAL**	
Country	Actions	Share of	Actions +	Actions	Share of	Actions +	Actions	Share of	Actions +	Actions	Share of	Actions +	Actions	Share of	Actions +	Actions	Actions +
Average team																	
Russia	**124**	**47%**	**57**	**27**	**10.2%**	**14**	**16**	**6%**	**6**	**87**	**33%**	**38**	**8**	**3%**	**2**	**262**	**117**
Serbia	**102**	**46.6%**	**46**	**27**	**12.3%**	**12**	**18**	**8.2%**	**7**	**49**	**22.4%**	**24**	**23**	**10.5%**	**12**	**219**	**101**
Poland	**104**	**39.8%**	**50**	**34**	**13%**	**21**	**16**	**6.2%**	**8**	**84**	**32.2%**	**35**	**23**	**9%**	**9**	**261**	**123**
Croatian	**46**	**36%**	**16**	**14**	**11%**	**3**	**13**	**10%**	**7**	**46**	**36%**	**19**	**9**	**7%**	**4**	**128**	**49**
Romania	**19**	**21.3%**	**11**	**20**	**22.4%**	**10**	**13**	**14.6%**	**6**	**36**	**40.5%**	**25**	**1**	**1%**		**89**	**52**
General average																	
	395	**41.1%**	**180**	**122**	**12.7%**	**60**	**76**	**7.9%**	**34**	**302**	**31.4%**	**141**	**64**	**67%**	**27**	**959**	**319**	**33.26%**

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Defense becomes more aggressive and better organized, depending on each attack action that adopt devices and special tasks, priority system Z6 withdrawn.

The trend that is emerging in the world, is a defense organization based block device group, covering an area of land in line 2 and mainly defend the attack in force, the limit lanes, completion gaining strength direction and a share majority (**table nr. 3**).

Table 3 – Share of dominant directions for attack, players were made by participating teams qualifying tournament J.O. 2012

	FIRST LINE	FIRST PHASE		SECOND PHASE	
RUSSIA	**Average 2 games**	**80,72%**	**81,79%**	**27,01%**	**22,93%**
POLAND	**Average 2 games**	**70,9%**	**66,06%**	**38,96%**	**33,95%**
SERBIA	**Average 2 games**	**77,54%**	**75,05%**	**47,57%**	**30,08%**
GERMANY	**Average 1 game**	**74,87%**	**85,36%**	**23,8%**	**36,18%**
	GENERAL AVERAGE	**76%**	**77,06%**	**34,33%**	**30,78%**
	SECOND LINE	**faza 1**		**faza 2**	
RUSSIA	**Average 2 games**	**77,75%**	**42%**	**75%**	**58%**
POLAND	**Average 2 games**	**75,37%**	**72%**	**32,81%**	**28%**
SERBIA	**Average 2 games**	**71,45%**	**72,36%**	**37,73%**	**27,63%**
GERMANY	**Average 1 game**	**86%**	**82,85%**	**28%**	**17,14%**
	GENERAL AVERAGE	**77,64%**	**67,25%**	**43,5%**	**32,75%**

Discussion

Concern for action to ensure the lock and taking the attack placed pass into the background as long as the lock succeeded, organization and effective player action, to increase its share in the defense team stood at over 40% of tampering attack, attack and put significantly reducing weight and efficiency in game 3-10% (Ionita, 2007).

Multiplication completion variants of the attack, by the use of a wide range of lifting speeds and trajectories, as well as areas along the length of the net and the target area of the opponent's court, imposed solutions organization seeking effective defense devices.

Rigid and relatively limited action players in defense device required by the rules of a particular defensive system cannot be fully effective, given the great variety that has attack and construction may well exploit the deficiencies it has any defense system. This is the reason why leading teams using combinations of several systems, or different devices, depending on each case of attack (Şerban, 1999).

Defender behavior within the limits marked by a certain system, begins to be increasingly less used in favor of a more liberal behavior, anticipatory, with the choice solution drive multiple dependent variables (own block, dominating attack adverse express duties for the sequel, and so on).

Clashes defending our teams in international competitions and team representative attack leading teams in recent years, the efficiency achieved in defensive actions constitute an argument of optimizing devices and actions players need to achieve a balance of attack and defense contribution game and increase your chances of winning the team's only competitive in terms of organizing the attack (Marza, 2000).

Increased efficiency defense is achieved by adopting devices and actions, through flexibility to cover the widest possible range of variability construction adverse attack.

Behavior of players in defense, depending on the construction of adverse attack is carried out within devices adopted by inter-cooperation relations both between those acting on the ball, as they and other players between receiving tasks, depending on their block, which acts to cover an area clearly defined by the length of the net and onto ground and, depending on which placement is made other players, especially for taking the attack in force.

Conclusions

Elements of progress resulting from analysis carried out by us and necessary to obtain high performance us:

speed and variety in attack and defense game

These factors express the general dynamics of the game, running speed action and indirectly surprise that generate variety in enemy action. Its realization requires: anticipation, reaction speed, creativity, cooperative play, fast-moving, and surprise and deception opponent.

Crucial importance is the height dominance over the net, for the striker as you jam. To achieve them are shooters and cover the attack force necessary directions

senior players, very good jump, high skill and training as these actions play.

Perfecting og skills
Accuracy, reliability and high efficiency core activities and, especially, the high level of specialization line dominant action is found in the players top teams, which are distinguished by the high percentage of successful game action and low number of mistakes, taking particular actions, work and setting.

Experience the competition
Considered as the main success factor is measured by number of international games, the number of years of activity in representative teams and the number of hours of training. Top teams, made, on average, before entering the major competition, 150 international games and basic players get to 350-400 games.
Age players, is considered a good indicator for assessing the experience. The winning teams of C.M. and Jo, have average age was around 24 years - female and 26 years old male.

Although it is difficult to make predictions about future developments that will mark volleyball, from News and trends currently can predict the future:
• increasing strategic importance and tactics for both attack actions and for the defense;
• coordinators role and outstanding players in the game will increase team and training;
• revitalization of old game actions or innovations in attack and defense;
• specialization of players will continue on a multilateral fund general education;
• greater similarity between game practiced by girls and that of boys;
• developing mental preparation of the players will increase;
• the training remains a key factor in developing dynamic performance;
• technical leadership in complex and professional management team, both in the preparation, as well as that
of competitions;
• increasing the number of major competitions and more difficult to penetrate and maintain top global hierarchies.

In preparation area volleyball players, along with modeling Conditions; methodological orientation and content of training, weight training extends directly through games, which grows increasingly specific weight (80-100 games / year), training performance components (bio-motility, technical and tactical , psychological), achieving approximately 1/3 of the volume of training in specific conditions of competitive game (Bompa, 2003)

This strategic orientation training involves:
• obtain a continuous availability performance, the fund whose superior training to achieve maximum athletic form steps;
• using a relatively small number of exercises, with selective and cumulative efficiency (based media selected and streamlined the structure, content and dynamic request);
• rapid physical and psychological recovery immediately after exercise to ensure the development of high volume and intensity of training daily (2, even 3 lessons / day);
• Use of appliances, items of cybernetics and mathematical programming and conduct training and competition dynamics;
• interdisciplinary scientific oversight body responsiveness to demands of training and competition by bringing together specialists brigades (physician, psychologist, biochemist, coach, statistician, nutritionist, etc.).

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STUDY ON THE CONTENT OF THE GAME AND EFFICIENCY OF ACTIONS OF CENTER IN VOLLEYBALL PLAYER

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Abstract
The present paper entitled "*Study on the game content and the efficiency of the center player in volleyball game*" consist in analyzing model, due to essential changes occurred in the current competitive game content: increased speed of the game, increasing the strength of the attack, execution and service the lock and specific features of the takeover of attack changes due mainly to new changes in the regulation.
Hypothesis. That the game of volleyball is carried out by certain fundamental characteristics due to application and effectiveness of the game the players that make the team, printed features training model, determine the positions of the game, the players involved and the center position becomes an objective necessity which may lead to increased whole team game parameters.
There have been a few tasks off our research literature including information on the state of knowledge on the chosen topic, gathering information and data on game content in zone 3, in terms of weight and overall efficiency of game actions and for the two structures, analysis of results, their interpretation and separation of the most important conclusions of the theoretical and practical, which can be helpful in charge of training specialists.
Method. Mathematical processing of data from records is preferable to meet international standards developed by the FIVB, so we can relate to them (summarized by M. Serban, 1998 and 1999). Their scaling on 5 levels, as follow:
0 = wrong (-);
1 = keeping the ball in play to limit error (-0);
2 = continuation phase with limited tactical actions (0);
3 = optimal condition for continuation phase (+0);
4 = point (+).
The last level (4 = +) is found only decisive action: service, attack after reception, attack after digger and block. For the other actions: reception, setter after reception, digger. and setter after digger have only four levels, the latter being seen as a great (3 = + 0) as there are actions completed and linking players play the same team.
Conclusions. Research conclusions have been systemized on issues that were derived from the general hypothesis of the study.
Key words: game, efficiency, skill, volleyball

Introduction

One of the important objectives targeting high performance and great performance in sports games in our country is the determination and content knowledge in the international game of high-performance athlete. Development of a new concept in sports games, it is necessary and possible to fund aims to determine, based on the science involved, game content and efficiency, to ensure the necessary information sports performance (Niculescu, M., 2000). It can be designed to recover sports games on the national performance without objective knowledge of game content, the performance achieved international knowing the fact that the game content differences are major (Ghenadi, V. 1995).

Volleyball game, relatively simple, once, by training players and multilateral actions scroll speed of the game, get to enjoy a wide increasingly accepted by the audience. Practicing intense dispute between the actions of attack and defense to win points, based on a thorough analysis of the structure and orientation in new directions, according to current and future needs, displays volleyball game in the first world affirmation plans with other sports performance (Ioniţă, M. 2007).
Determination volleyball, is to adequately solve the problem of game specific analysis in general and for each item the team in the weight training and getting performance issue that has always attracted great interest, being a prime concern order of coaches, doctors, scientists, athletes and others involved in the movement of high-performance volleyball players (Mârza, D. 2006).
To identify the senior player in the team would make the stage knowing they are in the content, effectiveness, and directions in which the game is going evolution performance teams (Păcuraru A, 1999).

Therefore, we considered that developing models positions, can lead to learning and exact knowledge of the content and effectiveness of all actions during the game, being able to provide

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information necessary to enter the most appropriate training in accordance current competitive reality game, leading to obvious progress's volleyball competitions at large scale. The eefficiency of middle blocker has other coordinates (service, taking the service, attack, block, attack takeover) and now there are only three components (service blocking attack) which reconfigures its preparation and training objectives

Achieving accurate content analysis according to the reality of the competition game can give us a great deal of accurate information on the game of the center player, middle blocker or how the shooter was formerly called the main information that can provide essential and indispensable parts in preparing players for the job and also the development of a model on new game (Cojocaru A., 2007). Determination of the content game should contribute to the knowledge state volleyball practice at this level, the reference is the internal competition reality game.

Hypotheses of research

Determination of the content game should contribute to the knowledge state volleyball practice at this level, the reference is the internal reality competition.

To check the working hypothesis we sought to obtain from the records at the National Senior Games Championship - information on successful and unsuccessful actions during competitive game player to the center. This was directed to determine their effectiveness and to detect and find real solutions to eliminate errors and improve game.

May come off the following tasks for our research:
-literature information on the state of knowledge on the chosen topic;
-gathering information and data on game content in zone 3, in terms of weight and effectiveness of the game in general and the two structures;
-processing information and highlighting the most characteristic aspects of the game content in zone 3;
-analyzing the results, their interpretation and separation of the major conclusions of the theoretical and practical, which can be helpful in charge of training specialists;
-structure and development of research findings.

Research methods were:
- method of documentation;
- observation method
- method call;
- statistical and mathematical methods of recording and data processing;
- modeling method

The way data processing

Mathematical processing of data from records is preferable to meet international standards developed by the FIVB 1992, so we can relate to them (summarized by M. Şerban, 1998 and 1999). Their scaling on 5 levels, as follows:

0 = wrong (-);
1 = keeping the ball in play to limit error (-0);
2 = continuation phase with limited tactical actions (0);
3 = continuation optimal conditions for of phase (+0);
4 = won (+).

"As" (evaluated 4) is used only for actions serve, attack and block, .
"Full control" (evaluated 3) is used when all possibilities for building created game of phase.
"Limited control" (evaluated 2) is used when preparing attack can be achieved using all options.
"Without control" (evaluated 1) is used where building attack is possible, thus still remaining the ball in game.
The formulas used to calculate efficiency actions were as follows:
Serve and attack
$E = \{4 \times (4 - 0) + 3 \times (3) + 2 \times (2) + 1 \times (1)] \times 100/4 \times N$
Setting
$E = [3 \times (3) + 2 \times (2) + 1 \times (1) – 1 \times (0)] \times 100/3\ N$
Block
$E =[4 \times (4) + 3 \times (3) + 2 \times (2) – 1 \times(0)] \times 100/4\ xN$
Reception from serve and attack
$E = [3x\ (3\text{-}0) +2 \times (2) +1 \times (1)] \times 100/3\ xN$

Interpretation of results
In order to analyze better and detail of zone 3 player game I made several types of models, such:
The model of content the game - developed for accurate knowledge of the average share of game actions, the number of points earned and lost in the average set by the center player.
The model of actions game – made in order to know exactly the content and effectiveness of all actions of the player specific game 3, how each action is used in the game by the player and each share contribution in winning or losing points and sometimes the services in accordance with reality of the game competitive at this level.

After processing the information and data obtained through records in league games we have developed the following model, whose average values are shown in the table below:

Table 1 – The number of actions for set

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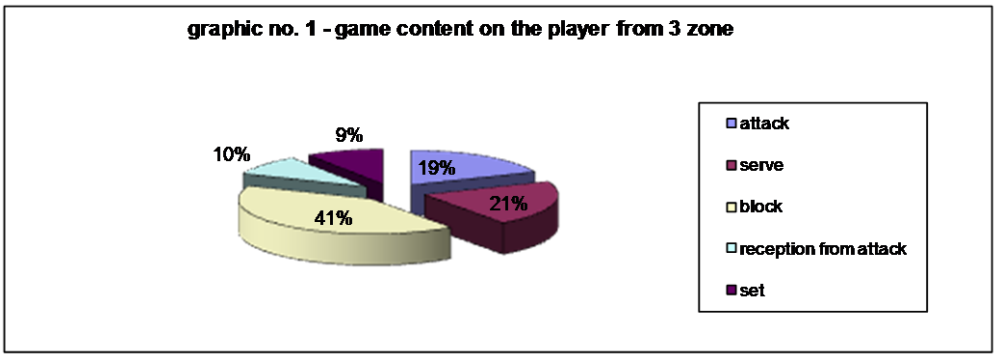
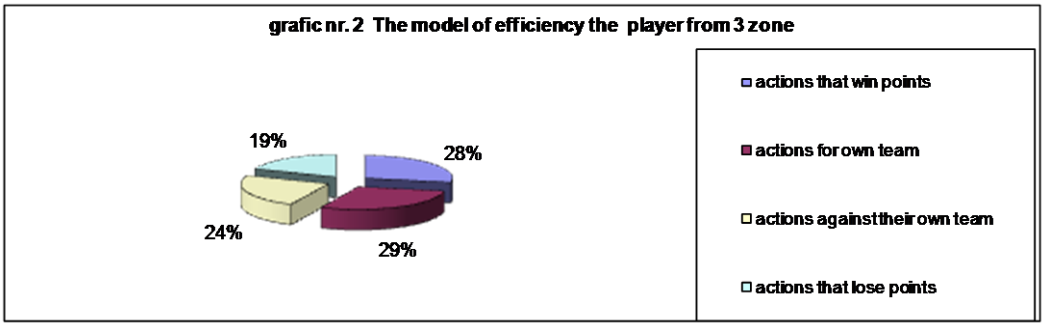
No.crt.	COMPONENTS MODEL	Average number actions / Set	PERCENTAGE
1	Average number of actions./ Set	19,3	100%
2	Atack	3,1	16%
3	Serve	3,3	18%
4	Block	6,8	35%
5	Reception from attack	1,5	8%
7	Set	1,5	8%

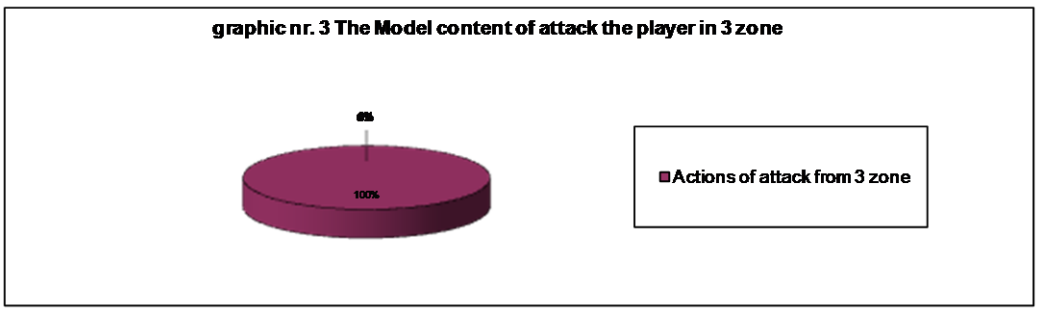
Graphically elaborated model is as follow (graphic nr. 1)



The average values are obtained when the following:
Of 19.3 action game made by a player of zone 3 during a set, it:
- game average of 5.3 actions that win points, representing 28%
- game average of 5.3 actions in favor of team, representing 29%
- game average 5 actions in play against own team, representing 24%
- play on average 3.5 actions that lose points, representing 19% of the game.



After processing the data we obtained the following pattern of attack content:
- total actions of attack per set: - 6,8 representing 100%
- actions of attack from 3 zone - 6,8 representing 100%



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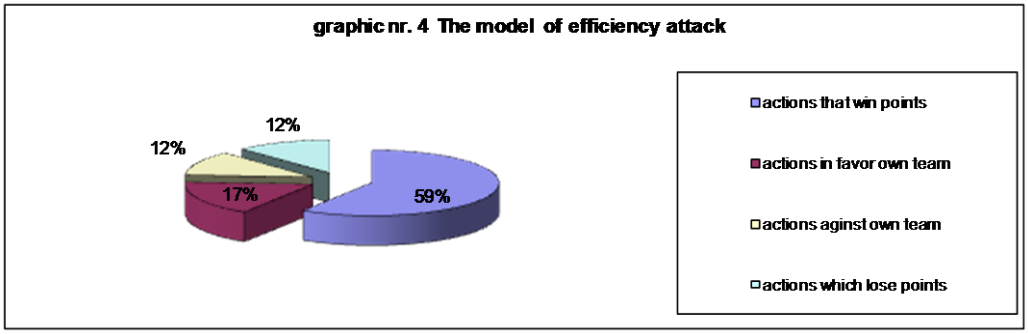
In order to obtain of a complete image of the game rendered the player attacking zone 3, we developed a model of efficiency of attack, which is so:

Of 6,8 actions game made by a player of 3 zone during a set, it:

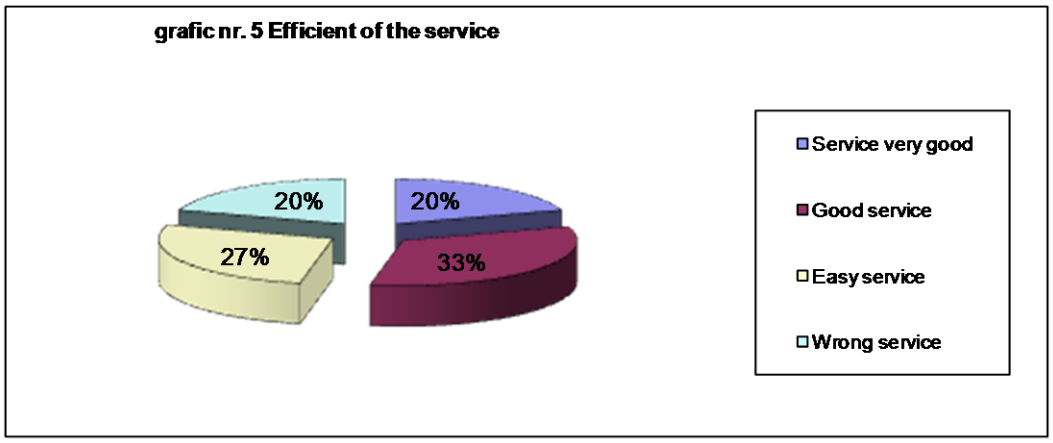
- game average of 4 actions that win points , representing 59%
- game average of 1,2 actions in favor of own team, representing 17%
- game average 0,8 actions against own team, representing 12%
- game average 0,8 actions which lose points representing 12%



In the functional model of the player 3, service occupies a prominent place in the hierarchy of action game, that player runs an average of 3.3 services per set, the second action as a share of total shares game.

Of 3,3 actions game made by a player of 3 zone during a set, it:

- game average of 0.2 actions that win points, representing 20%
- game average of 1,2 actions in favor of own team, representing 33%
- game average 0,8 actions against own team, representing 27%
- game average 0,2 actions which lose points representing 20%



The effectiveness of this action is set at a level high enough for this player so out of 3.1 shares per set: Of 3,1 actions game made by a player of 3 zone during a set, it:

- game average of 0.9 actions that win points, representing 30%
- game average of 0.5 actions in favor of own team, representing 16%
- game average 0,6 actions against own team, representing 19%
- game average 1 actions which lose points representing 35%

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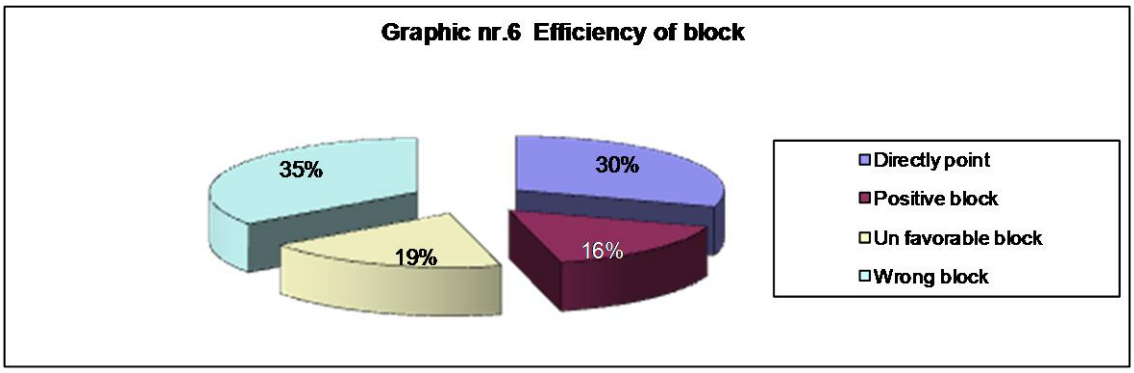

Discussion

Mention that a player set a maximum of 48 teams participating in the basic game situations if the set ends 25-23, of which 52% are playing fundamental situation in service execution and 48% play fundamental situation takeover of service (Ghenadi, 1995). These percentages change if the sets are won more clearly, the fundamental situation in winning percentage increasing and decreasing percentage the service the other.

For example : set ends with 25-15:

- game to the service - 62,5%
- game to the receiving of service -37,5%

Returning to the first example, when set to play to 25-23 score in 48 basic situations played, 75-80% have been formed from a single rally while only 20-25% were composed of 2 and 3 phases, growth conditions and requirements at maximum effort.

In these conditions a set play on average 410 to 415 action game, of which 40-45% are playing ball action, and 55-60% share playing without the ball. On average a player plays the actions set about 40-70 games of which 16-40 ball action, the number being higher or lower depending on the value of each player in the band and station that plays it.

Consequently, a volleyball game, a player participates in almost all actions of the game with the ball and without the ball, which according to the number of sets played (3, 4 or 5) can be between 120-350 stocks of game , which shares 50-200 game in which the ball touches in one way or another (Păcuraru, 1999).

The player 3 or player from the center, as it is called, generally participate in a real balance to all acts of game, it is a balanced mixture of the other positions listed.

Full evaluation in accordance with the reality of the game player competitive game of the 3 is made with efficiency calculation and comparative analysis achievement and graphical representation.

Conclusions

Research findings have been collated on issues that were derived from the general hypothesis of the study:

The data presented in the content model of the game is noted that one of the essential and paramount changes of this post, is the blocking effective action.

The player 3 is a complete player in the first line, which should be in addition to a good player and a very good offensive player to block.

Blocking action game is the most important player of the game 3, its value and job requirements within the team is essential and often defining the winning game;

Finalized (especially attack and block);

Is necessary to increase the concentration in the game, to eliminate relaxation moments of inattention and service occupies a top place in the hierarchy of game actions as average number of actions per set and less like efficiency. It is noteworthy that the decrease in efficiency due to new regulations of the service;

Setting is an act with a smaller percentage of the player in the game but the greatest efficiency, that due both to fewer exceptions and that runs relatively mild conditions, when the linkage involved in reception.

This research trying to make a real and analysis as conclusive, the content and effectiveness of the player of the game 3 senior level, we found that this post is of great importance especially in a team game, in that these players are generally the most valuable defensive game economy they are the best players blocking team and participate in approximately equally in both departments of the game in attack and defense in line I.

After the assessment found that the seniors, this player does not comply, in many situations this post requirements for high performance volleyball. Many of the data representing the content and effectiveness of the game are below the level of scale in international competitions, but the national championship this level is appropriate, indeed one can observe a growing interest in increasing the value of these players

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THE COMPARATIVE ANALYSIS OF THE SPECIFICATIONS OF WEEKLY TRAINING CYCLES AS COMPARED TO THE TRAINING STAGES OF A LONG JUMPER

DULGHERU MIRELA[1]

Abstract

The Training Objectives for a long jumper are represented, on the one hand, by the activities of learning and perfecting the techniques of the jump and, on the other hand, by activities meant to develop the motric capacity.
The effort characteristic to long jumps is an intense one; it takes time and requires constant improvement of the motric capacities, and is essential for attaining the high performances.
The Present research intends to validate the hypothesis thus formulated: if we plan the training that aims at the preparation stages, that precedes the competition, as well as those occurring during and after competitions or the recuperation, for the long jump competition, then we have to take into consideration the technical and method particularities in order to choose the right means and dosage of effort during the training that has to be different between the weekly training cycles. These aspects are essential between the weekly training cycles for each stage. The present research aims at the Olympic cycle, of 4 years, period in which we registered all the training means used during each stage, taking into consideration the volume of training as well as the intensity of the effort.
The Methods used for the research in the scientific endeavour of this research were the following: the bibliographic method, the making of a record, the analysis and the comparison of data, as well as the statistical method. The research has at its basis the documents according to which the activity of a long jumper was planned (the author of the research) who had high results in the world classifications of this competition (7.14 m).
The General *Discution* and Conclusion of the present research underlines the fact that the training weekly cycles differ according to the preparatory stages, as to the diversity of the used means during the training course as well as from the point of view of the training effort whose indicators are different, in accordance to the demands and objectives of that particular stage. Domain experts have demonstrated the effort means and indicators whose parameters are differentiated according to the requirements and objectives of each stage and presents structures, periodizations and training cycles as well as action technologies in applying the weekly cycles whose principles can be perfectly applied to the conclusions of the paper herewith.
*Key words***:** training stages, long jump, dosage means.

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Introduction

A modern training requires more and more effort from the part of a long jumper. Achieving performance in this athletic test, at the level of nowadays worldwide requirements makes it necessary to devote a lot of time to training and the energy spent during this training must be oriented and adapted to the requirements of each stage. A continuous training regularly performed throughout the year represents a mandatory condition in the athlete preparation, regardless to the competition he is training for and is specialized in.

The distribution of the training throughout the year must be done according to the need to achieve superior indicators of performance in certain stages set in the athletics timetable. This is why the annual schedule must be structured so that it alternates the periods, training stages, pre-completion, with the competition stages of the schedule. This is also the reason why the annual training cycle must be structured in such a way that it alternates the periods, stages of training, pre-competition with the competition ones, of recovery and transition. During training we shall take into account especially the competition schedule, the performance objectives, the tasks of the training and the necessary time to solve them. The organisation of the training for the long jump, athletic task with competition season indoors and outdoors, shall be done as follows

Preparatory period November 1st – January 31st
Competition period February 1st- march 4th
Recovery period March 6th- 15th
Transition period March 15th – 20th
Preparatory period March 20th – May 15th
Competition period May 20th – September 1st
Recovery period September 1st – September 15th
Transition period September 15th – September 30th

Each of these periods has specific tasks and objectives well defined under the aspect of means, specific to training effort and competition, to the characteristics of effort indicators etc.

The preparatory period is characterized by training that aims at achieving motric indicators, physiologically heightened compared to the ones of the precedent year, there where this is possible, a higher training volume, the general development of the of the motric qualities as well as those specific to the competition in which he specializes, the raise of work capacity of the important body functions, the accumulation of theoretic knowledge that can offer the athlete another perspective in approaching training. During the preparatory period we are interested in the general physical training that aims at ensuring the body of the jumper a good work capacity for effort and has to reinforce and maintain a good health, to increase body resistance, improve motric capacity and also increase motric habits, perfect the manifestation of these motric abilities and the ability to adapt to different situations, obtaining a high training level in order to help the athlete get in shape easily and maintain that physical shape. Among the physical training means used during training we can enumerate: sprints, fencing, runs on different types of terrain, different types of throws.

The competition period is the time we try to obtain a high sports physical shape in order to achieve high performance. We develop motric qualities specific to the test, we increase the training degree, we maintain the physical training at a high level, we ensure a good technical training, perfect the technique, we ensure a good psychological training and we try to perfect this technique through competitions, to obtain competition experience. We notice that we need to continue to develop the motric qualities specific to the long jump. For example, speed – that is an important motric quality for a long jump is situated on the same level as force or detent. For the long jump, speed tends to reach its maximum point on the last part of the take-off and this makes us focus on it even more during training, especially for distances of 40–50 m take-offs. The training for speed development of the long jumper, as the quality of his sports master ship increases, becomes more and more specialized and is oriented towards the requests of the competition. The special speed is defined by the capacity to execute at a required speed, usually very high, the competition exercises, its elements and parts. The special speed, especially the maximum one is specific and it refers strictly to the learnt movements of the action, that are perfected during training for the exercises it refers to. The speed of the movement is conditioned mainly by the brain cortex, the nervous process that command contraction, strain and muscle relaxation that directs and coordinates the action of the jumper. Speed exercises are included in all the stages of the annual cycle, but during winter the running distances are smaller, but the exercises for developing reaction speed and execution will be increased. During all take-off and summer stages the training will focus on developing movement speed. The general volume of these exercises won't be very great, taking into account the high intensity of the execution. During the competition stages, when full take-offs are used, apart from special speed exercises, the development of this skill will be performed separately or at the same time as the technique, during take-offs, as some specialists state; Todea, (1971), Bauersfel, (1979), Gracev, (1981), Tatu, (1981) all quoted by professor Ionescu, [Ionescu Bondoc, PhD thesis, Chişinău, 2004].

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As a result of the discussions held with the trainers and elite jumpers, and also taking into account my personal experience of long jumper, in order to develop the necessary motric qualities to obtain notable results in this competition, special methods and training means are used, and they all can be met in the literature in this field.
The trainers have the task to dose them according to the athlete capacity, his level of training and objective. We will present as follows examples of such means for every single one of these motric capacities. We can develop these motric capacities in the long jump using the following exercise:
- run with start standing over distances of 20-60 m and tempo of 95-100%;
- run with launched start over distances of 20 – 50 m in tempo of 95-100%;
- run with start standing down over distances of 20 – 50 m in tempo of 95-100%.

To these exercises that are specific to a sprint runner we must add exercises that are specific to the long jump with take-off, such as:
run with take-off passing over the threshold;
running at different paces over distances of 40 – 60 m.

We often use exercises that develop reaction speed:
sprint with start standing down at command, over short distances of 10 – 15 m;
Running with varied tempos on short distances at command.

The force is not only an important motric quality in the training of long jumpers and is presented in training throughout the year at almost every stage, but the means and its intensity and volume differ according to the stage we are at.
Developing muscular force for long jumpers has many methods, among which, the most well-known and used one is the weight lifter method.
In the development process of force we are first of all interested by the muscles that perform the main effort in the long jump. Thus, we have established exercises that are meant to increase force in the body segments, as follows:
In order to increase force at the level of lower limbs the following strengthening exercises shall be used:
the semi- squat while expanding the legs or finalized by jumps;
pushing weights with the legs while lying (fixed position) ;
jump with weights and without ;
lift on the toes with the weight on the shoulders ;
running uphill ;
jumps over different types of fences;
multiple jumps in semi-flexion;
extension jumps with counter-movement.
In order to develop the muscular force of the trunk we can use the following exercises:
bending ahead and regaining straight positing with the weight on the shoulders;
lifting the trunk in different positions with weights;
bending the trunk while lying on a non-levelled bench with weights on the back of the head;
throwing the medicinal ball in different positions.
In order to develop arm muscles and those of the scapular belt we can use the following exercises:
lifting the weight to the chest while sitting;
pushing while lying;
squatting.
In order to develop the abs and those of sacolombar muscles we can use the following exercises:
bending the trunk while sitting on a non-levelled belt;
lifting the legs above the head while hanging from the trellis.

Another motric quality of development that will be permanently found during the training classes of the long jumper, regardless of the training stage we refer to is grace. .
Grace is a motric quality that helps the easiness with which the athlete runs as well as to the performance of the take-off and jump. We noticed that grace manifests itself especially during the take-off by the amplitude of the steps and influences the personal results of top jumpers of the years 1992-2000. We must also add that long jumpers are also excellent speed runners, (fact that I must personally insist on, myself being an excellent sprinter, even a national record man), as during take-off a maximum controllable speed can be developed through the last stride and leap from the ground.

All these means and methods that we described are present during the training throughout the year, weather when we talk about the training stage, pre-competition stage, competition, but they all bear different significance on the volume and intensity at which we work with them in full accordance with the stage we refer to.

The recovery period is obligatory but can have a different approach according to the number of contests at which the athlete takes part in, the degree of physical and psychical effort the athlete had to undergo, whether he suffered or not from accidents throughout the training period or during competition.

The transition period is one that facilitates a gradual passing from relaxation or rest to the active state of training, the re-accommodation to effort, to a very orderly program to regard to sleep and diet.

The Hypothesis and Scope of the Research

The present study wants to validate the hypothesis thus stated: if we schedule the training that is made of preparatory stages, pre-competition one, competition and recovery, for the long jump, we must take into account the technical and methodical particularities as to the means and effort dosage in different training that is specific to every stage of the training. The

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present research refers to an Olympic cycle, namely one of 4 years, period that registered all the training means characteristic to every development stage, taking into consideration the volume and intensity of the effort. In choosing the methods of development of different motric qualities necessary to obtaining high performance, we tried to use complex ones, measuring the exterior qualities and the internal ones, permanently trying to transform the temporary uncontrollable, the uncontrollable (unknown) in measurable (known, controllable). Only by doing so their effect and biological echo became favourable to this type of competition – the long jump.

Research Methods

The research took place during the Olympic cycle 1988 – 1992, the data was gathered from my personal annual training, that generally followed the same schedule, the difference represented the quality of the training, its volume, that was gradually increased every year, but each starting point of the training consisted of the values of the high indicators that allowed us to boldly approach the yearly schedules, while continuously increasing the volume and intensity volume. Every year we approach the two competitive seasons. We must mention that in the year 1992 we were especially interested in the open air competition, namely the Olympics in Barcelona 1992. The used research methods during the scientific endeavour were as follows: the bibliographic method, the registration and data comparison, the statistic method.

The research was based on the schedule documents of a long jumper (the author of this study) who had top performance in the world classifications of this competition (7.14 m).

Herewith, I shall include the schedule of my trainingprogram for the Olympic year 1992:

Results

Table 1. The Schedule of the Training Plan

TRAINING FOR ACHIEVING A SPORTIVE SHAPE					
THE INITIAL FORM OF DEVELOPMENT OF THE SPORTIVE SHAPE					
TRAINING PERIOD			COMPETITION PERIOD		
CREATING THE DATABASE FOR OBTAINING SPORTIVE SHAPE			PLANNING THE ACHIEVEMENT OF THE SPORTIVE SHAPE		
GENERAL BASIS	DOMINANT BASIS	SPECIFIC BASIS	CONTOURING THE SPORTIVE SHAPE	ACCELERATING THE SPORTIVE SHAPE	STABILIZING THE SPORTIVE SHAPE
5 weeks	3 weeks	3 weeks	2 weeks	3 weeks	5 weeks
		1Training contest with the results: 6.72m and 11.71for 100mp	2 Training contests with the results: 6.98m and 6.78m		4 Contests with the results: 7.09m, 7.14m, 6.90m, 6, 83m

Table 2. Example of weekly training cycle during the training period (creating general basis).

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
5 minutes - Gymnastics 3 minutes easy running 5 minutes - Gymnastics 5 minutes of easy running 10 minutes running exercises 6x100m Acc. ¾ 6x10 Abs 3x10 repeat back	5 minutes easy running 5 minutes gymnastics Force: squats with weights: 2x10x50 Kg, 2x10x60 kg, 2x10x70 kg Lift on toes with weights: 15x70Kg 15X80 Kg Pulling: 2x10x30 Kg 60 abs repeated 10 minutes easy	20 minutes of warming up 2-3x60 m Running exercises 6x200m ½ 50 abs repeated 2x10 backs repeated	Warming up 20 minutes. 1X60 m running exercises 10 decajumps 10x100m 60% 40 abs repeated 2x10 Backs repeated	Warming up 20 minutes Fence running: 15x4g x5 steps 3x30 m running with knees high 8x60m ½ 40 abs repeated 2 x10 back	Warming up Force: Squats with weight: 10x50Kg 10x70kg 10x90 Kg Semi squats with jumps: 3x10x80 Kg Tie lifts: 4x10x15 Kg Jumping steps: 2x10 50 abs repeated 5x200m 1/2

	running

Table 3. Example of weekly training cycle during the training period (creating specific database):

MONDAY	TUESDAY	WEDNASDAY	THURSDAY	FRIDAY	SATURDAY
Warming up 20 minutes 15 jumps standing down Timed running: 2x10m 2x20m, 3x30m Running with knees high: 3x40m 8x100m ½ //////////////////////////////// Warming up Long jump with small take-off: 5jumps with 5 steps 7 jumps with 7 steps 10 long jumps without take-off	5 minutes of easy running 5 Min. Gymnastics Force: squats with weights: 2x10x50 Kg, 2x10x60 kg, 2x10x70 kg Lifting on toes with weights: 15x70Kg 15X80 Kg Pulling: 2x10x30 Kg 60 abs repeated 10 Min. easy run	Warming up 20 minutes 3x50m jumping steps 3x50m jumping steps 15 long jumps without take-off 10 jumps on steps 50 abs repeated 2x10 backs repeated	Warming up 20 minutes Running 5x200m 1/2 40 repeated abs 2x10 backs repeated //////////////// Warming up 20 minutes Running with different tempos 6x100m Timed running: 2x30m 1x50m 2x100m 8 decajumps	Warming up Timed running: 3x30 m 1/1 Running with knees up 3x40m Long jumps: 5 jumps with 5 steps 5 jumps with 7 steps 8 jumps with 9 steps Speeded run: 4x100 (75%-85%) Abs with 40 repeats. 2 x10 back	Warming up Jumps standing down:12 repeats Timed running: 3x80m (90%) Force: Semi squats with jumps: 10x50 Kg 10x80Kg 10x90kg 10x100Kg 10x90kg 10x80Kg 10x60 Kg Launched run: 8x80m (1/2) 50 abs repeated

Table 4. Example of weekly training cycle for the competition period:

MONDAY	TUESDAY	WEDNASDAY	THURSDAY	FRIDAY	SATURDAY
Warming up 20 minutes Timed running: 2x30m 2x50m Triple jumps: 5 repeats Long jump :5 repeats Launched running: 2x100m ½ Abs: 60 repeats	5 minutes of easy running 5 minutes of gymnastics Speeded running:2x100m Pole-jump: 4 jumps Tripe jumps Running with the knees high: 1x30m (1/1) 60 repeated abs 5 minutes easy running	CONTEST Reached performance: 6.78m	Warming up 20 minutes Launched running: 4x100m (1/2)	Warming up Timed running: 3x30 m Triple jump: 3 times Long jump: 3 jumps with 7 steps 5 jumps with 9 steps Pentajump: 7 repeats Running with knees high: 3x30m Speeded run: 4x100 (75%-85%) Abs 40 Repeat.	Warming up Force: Squats with jump: 7x50 Kg 6x70Kg 4x80kg Semi with jump: 10x60Kg 10x70kg 10x80Kg 10x60 Kg Lifting on toes: 15x70 kg 15x80 Kg Lifting on tie: 4x8x15 kg 50 abs repeated

Table 5. Example of weekly training cycle for the competition period with 2 competitions of objective:

MONDAY	TUESDAT	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
Leaving for contest in Vienna //////////////////////// Warming up 20	5 minutes of easy running 5minutes of gymnastics Speeded run:2x100m	CONTEST Performance obtained:	Warming up 10 Min. Force: Squats with jumps: 7x50 Kg	Leaving for contest Sofia //////////// Warming up Timed running:	Warming up Jumps standing up: 5x10m (1/1) Long jumps without take-	**Contest** Performance obtained: 7.14 m

minutes Times run: 2x30m Triple jump: 5 repeats Long jump standing:5 repeats Running with knees high: 2x30m (1/1). Launched running: 2x100m ½ Abs: 40 repeats	Triple jump: 3 jumps Running with knees high: 1x30m (1/1) 30 Repeat. Abs 5 Min. easy running	7. 09 m	5x60Kg 4x70kg 2x4x80Kg Semisquat with jump: 8x50Kg 7x60kg 5x70Kg 2x4x80 Kg Lifts on toes: 15x70 kg 15x80 Kg Lifts on tie: 4x8x15 kg 50 Abs repeated	2x30 m Triple jump: 3 repeats Pentajump: 3 repeats Running with knees high: 1x30m (1/1) Speeded run: 4x100m (75%-85%) Abs 40 Repeats	off: 5repeats Speeded run: 2x100m (3/4) Abs: 20 repeats

Discussions

Following a certain type of schedule that aimed at scheduling the training period as well as that of the competition itself, we managed to draft, for each year, a training schedule that has the same principles, but different data. All the training techniques have the same major objective in reaching a sports good shape, according to the competition timetable.

As we can notice from **Table 1**, the training period has as main objective creating a database for achieving sportive shape. We refer to three types of basis: general, dominant and specific, that differ in terms of length, importance of means, have different characteristics as to the volume and intensity of effort. For the period in which our objective is to create general basis we work with an effort intensity of. 70% and a training volume of 95%-100%. During the training for forming the dominant basis, the trimming volume registers a slight decrease, between 90%-85%, and the effort intensity registers a slight increase, reaching a level of 75%-80%. At the end of the training period, we create the so called specific basis for training, that will have a volume that will not exceed 75%-80% but we'll register an increase of effort of 90%.

We enter gradually in the competition stage, by increasing the intensity volume during the period in which we contour the sportive shape, the training volume is gradually reduced, reaching 50-60% during the stage of sportive shape stabilization.

The means of general physical training:

- sprint
- fence jumping,
- running on different types of terrain,
- multiple jumps,
- different types of throwing exercises.

Means of special physical training:

- contest competition, mainly the long jump performed during contests
- contest competition perfumed during the training: in the same conditions as during contest, in modified conditions as to contest ones, having different types of take-off: small take-off (5 steps), medium take-off (7 steps) and big take-off.
- special exercises for consolidating and perfecting the jump technique and developing motric qualities.

Used means during competition stage:

- exercises for perfecting the jump technique
- jumps with big take-off
- timed run

Specific means for the recovery period:

- Active rest; movement games, swimming, other sports
- Physiotherapy, if necessary

The hypothesis of the study was confirmed, the data of the work are real, verified, this study has at its basis the data gathered from the training schedule of an Olympic cycle that was performed and finalised, obtaining worldwide performance in long jumps.

Conclusions.

The general **conclusion** of the present research underlines the fact that weekly training cycles differ according to the training stages by the diversity of means used during the training class as well as the characteristics of training effort whose indicators differ in importance according to the requests and objectives of the stage.

This aspect is presented and demonstrated by Professor- Trainer Ionescu Bondoc, in his PhD thesis, sustained at Chişinău, (2004). He thus presents the effort means and indicators whose parameters are differentiated according to the requirements and objectives of each stage. Professor and trainer (1987)in his book „Performance Athletics " presents structures, periodizations and training cycles as well

as action technologies in applying the weekly cycles whose principles can be perfectly applied to the conclusions of the paper herewith. We recommend staging the training schedule according to table 1, as the preparatory stages fulfilled and stresses all the demands of the training stages, makes it easy to choose the necessary means and allows efficient dosage of the 2 indicators and the training effort, namely volume and intensity and it also adapts the training effort according to its specific needs and the requests of the training task and the competition demands.

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IULIU BODOLA, REMARKABLE PRSONALITIY FROM FOOTBALL IN ROMANIA AND HUNGARY

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Abstract
The Aim. During the two World Wars, a series of valuable football players played in the teams of Oradea. The author's purpose is to present, within the cycle of paper works dedicated to representative football players from the football of Oradea in that period, Iuliu Bodola, an iconic player for Romanian and Hungarian football.
*Objectives***.** This paper work refers to Iuliu Bodola's evolution and results in the teams from Romania's Championship (Braşovia Braşov, IAR Braşov, Athletic Club Oradea, Venus Bucharest and Ferarul Cluj), his contribution in Romania's representative team (48 matches and 30 goals scored), his contribution as a player in Hungary's national championship (Nagyváradi Athlátikai Club and M T K Budapest) and in Hungary's representative team (13 matches played and four goal scored). The paper work also refers to Iuliu Bodola's work as a coach (MTK Budapesta, MÁV Szolnok, Haladás Szombathely, VSK Pécs, Bányász Komló, SE Gyula, V T K Diósgyőr, B T C Salgótarján and Bányász Ormosbánya).
*Methods Of Research***.** Documentation was accomplished by studying certain materials regarding the history of football in Romania, by researching certain paper works and articles referring to football in Bihor County, by consulting certain iconographic materials and documents from personal archives, by having conversations with collectors and people who have information concerning the evolution of local football during 1930-1948.
*Conclusions***.** Between 1930 and 1948, Iuliu Bodola played 329 matches in Romania's and Hungary's championships, scoring 182 goals, being one of the representative players of that time. He was one of the players who played both in Romania's and Hungary's championships. According to the number of selections, of scored goals and his evolution, he was one of the representative football players, both in Romania and in Hungary. He was coach for 9 teams of different value levels, without having remarkable results.
*Key Words***:** Iuliu Bodola, football, Oradea, Romania, Hungary.

Introduction

During the period between the two world wars, Oradea, together with Arad, Bucharest, Cluj, Resita and Timisoara, was on of the cities with the most advanced football in Romania. After the teams from Oradea had obtained remarkable results during the 20's, even in the final stages of the Romanian championship and had promoted a series of valuable players in the national team (Francisc Rónnay, Ştefan Strőck, Iosif Bartha, Nicolae Hőnigsberg, Adalbert Strőck, Geza Nagy-Csomag, Ladislau Csilag and Ferecz Szekely), football in Oradea went through a decaying period (Angelescu, Cristea, 2009).

At the beginning of the 30's, as measures to strengthen football in Oradea, the promotion of young players from Oradea occurred, but also, some valuable players were transferred from teams from the country. Amongst the players transferred to Oradea during that period was Iuliu Bodola.

Essay content

Within the cycle of paper works concerning valuable football players from Oradea during the two world wars, the authors have established as their purpose to present Iuliu Bodola's activity, one of the most representative football players who performed during that period. The work presents interest for those who study the history of football in Oradea, especially regarding the players from the interwar period.

The paper elaboration has been based on scientific documentation achieved by studying the specialty literature regarding the history of football in Romania, by the research of paper works regarding the evolution of football in Bihor county, by consulting articles from the local media, iconographic materials and documents from personal archives. The documentation has also been accomplished by discussions with collectors and people who have information about the evolution of football in Oradea during the studied period.

Player in the Romanian Championship

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Iuliu Bodola was born on the 26th of February, 1912 in Brasov (Ionescu, Tudoran, 1984). He learned to play football together with the children in his neighbourhood. His special qualities for football had been noticeable since he was a little child. In 1925 h was included in the children's team of Coltea Brasov Football Club where he started to train in an organized manner.

In the Romanian championship he played for Braşovia Braşov (1928 – 1930), Athletic Club Oradea (1930 – 1937), Venus Bucharest (1937 - 1940) and Ferarul Cluj (1945).

Between 1928 and 1930, he was part of the Brasovia team where he played with Varhegy, Vedel, Rupp, Szilagy, Erös, Toth, Trisch II, Nachary, Salangy, Geller, Agoston, Erdö, Cotty, Berkessy, Ciakme, Naghi, Kelemen, Goldstein, Bölöni I, Niculescu, Kovacs, Vogl, Naghi II (Ionescu, 2002).

In the white-green T-shirt of the Athletic Club Oradea, having Czinczér, David, Mikó, Stettner, Sternberg, Kádár, Stemberg, Weichelt, Glanczmann, Moskó, Kovács I, Ronnay, Kocsis, Chendrean, Bartha, Chiroiu, Krausz, Juhász, Szarkadi, Sikó, Halatay, Borgea, Kovács II, Szániszlo I, Orza, Spielmann, Pop, Vărzan as team mates, he played in eighty-nine matches and scored fifty-two goals. Thus, he had contributed greatly to the results obtained by the team in the national championship: 2nd place in the 1932-1933 edition, 3rd place in the 1933-1934 edition, 2nd place in the 1934-1935 edition, 4th place in the 1935-1936 edition (figure 1) and 6th place in the 1936-1937 edition (Angelescu, Cristea, 2009).

Figure 1. 1936. Athletic Club Oradea Team (Sourse: Nicolae Kovács Album)

He was part of the Athletic Club Oradea team which participated in 1932 to the tournament in France and Switzerland. Out of the 12 matches, The Athletic Club Oradea won six (Racing Paris 2 – 1, Montreuil 5 – 3, Olimpique Lille 5 – 2, Tours 10 – 1, OGC Nice 7 – 1, Espagnole Bordeaux 4 – 1), two were finished in a draw (FC Zürich 1 – 1, FC Lugano 2 – 2) and lost four matches (Rennes 0 - 1, Olimpique Marseille 1 – 2, Montpellier 2 – 3, Geni Representative 2 – 3), obtaining a goal average of 41-21. Iuliu Bodola was amongst the remarkable players of the team (Heller, 1981).

He was amongst the best players in the tournament from France and North Africa (Algeria, Morocco, Libya), in 1933. Out of the 25 matches, The Athletic Club Oradea won 21 and finished four in a draw, obtaining a goal average of 100 - 23 (Tőrők, 1937).

In the 1932-1933 edition of Romania's League, he was a member of the selected team of the Northern League, winning the competition final: Northern League – Western League 3 – 2 (2 – 2; 2 – 2; 1 – 1).

In 1937, answering to Janossy Bela's insistences, he transferred to Venus Bucharest. The transfer fee was 700 000 lei out of which the club took 450 000 and Bodola 250 000. His monthly salary was of 15 000 lei (Arena Sporturilor, 1937).

He performed there for three seasons, played in 61 matches and scored 7 goals. During that period Venus Bucharest, having as players David, Iordăchescu, Albu, Sfera, Negrescu, Ionescu – Crum,

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Bărbulescu, Beffa, Demetrovici, Juhász, Eisenbeisser, Gain, Lupaş, Bodola, Ene, Cârciog, Humis, Iordache, Orza, Ploeşteanu and Vâlcov, became Romania's champion in the 1938-1939 and 1939-1940 editions, it won Romania's Cup in 1940 (Angelescu, Cristea, 2009).

As a player of Venus Bucharest team during the 13th of October 1937 and 18th of June 1939, he participated in 5 games played within Central European Cup.

After the 2nd world war, for a short period of time, he played for a team from Cluj, Ferarul, where he played only in three matches and scored three times.

After analyzing the period while Bodola played in the Romanian championship, we notice that he performed in 153 matches and scored 102 goals, being one of the remarkable players from that period.

Figure 2. Pardubice in 1934 before the match against Czechoslovakia 2-2, in Central European Cup (Sourse: Nicolae Kovács Album)

Component representative football team of Romania

His qualities, his value proven in competitions led to his selection in Romania's representative team at an early age, at 19. He made his debut in the national team on the 10th of May, 1931, in the Romania-Bulgaria match played at Bucharest within the Balkan Cup.

During the 10th of May 1931 and the 20th of October 1939, Iuliu Bodola played 48 matches in the national team – two matches at the final tournaments of the world championship in Italy, 1934 (figure 3) and France, 1938 (Chirilă, 1983); one match within the 1934 world championship preliminaries, 60 matches in the Balkan Cup, 6 matches in Central European Cup (figure 2), one match in King Charles the 2nd's Cup, 5 matches in Eduard Benes Cup and 17 friendly matches.

Table 1. Number of matches played by Iuliu Bodola in Romania's representative team (2)

Final tournament	Preliminaries	Balkan	Central	King Charles's	Eduard	Friendly

WC	WC	Cup	European Cup	Cup	Denes Cup	matches
2	1	16	6	1	5	17

With the 30 goals scored, Iuliu Bodola had been for over 5 decades the goal getter of the national team. Now he is on the 3rd place among the national team's goal getters after Hagi (35 goals) and Mutu (35 goals).

As acknowledgement of his value and prestige among his team mates, he wore four times Romania's captain's band (May 7th, 1939, Romania-Yugoslavia match, May 18th, 1939, Romania-Latvia, May 24th, 1939, Romania-England and June 11th, 1939, Romania-Italy).

For his contribution in winning the 1933 edition of the Balkan Cup on the 12th of June 1933, through High Royal Decree, he was awarded the Cultural Merit for Sport Medal, 2nd class (Alexe, 2002).

Player in Romania's championship and Hungary's representative team

Iuliu Bodola was amongst the 49 players of teams from Bucharest, Craiova, Ploieşti, Petroşani, Reşiţa and other towns who, in autumn 1940, folowwing the Decree from Vienna, passed the border in order to try to make arrangements with teams from Hungary and Northern Ardeal. Together with Nicolae Kovács from Football Club Ploieşti, Augustin Juhász, Rudolf Demetrovici from Venus Bucharest, Francisc Spilmann, from UDR Reşiţa, he signed with the Athletic Club Oradea (Nagyváradi Athletikai Club), team where he performed between 1940 and 1944. (3)

In the 1940-1941 edition, the Athletic Club Oradea team, together with other five teams (Stăruinţa Oradea, Athletic Club Cluj, Bastya Cluj, Sportiv Club Satu Mare and Sportiv Club Baia Mare), took part in the Northern Ardeal Championship. In the summer of 1941, after the championship reorganization, the Athletic Club Oradea, together with the Athletic Club Cluj, Lampant Football Club, Szegedi Vasutas Sportive Association, MÁVAG Budapest and the Athletic Club Újvidék, was promoted in the first division of Hungary's championship (3).

During 1941 and 1944, the team from Oradea, playing in the first division of Hungary's national championship, achieved remarkable performances: 6th place in the 1941-1942 edition (5), 2nd place in the 1942-1943 edition and 1st place in the 1943-1944 edition (Demjén, 1989). With this result, the Athletic Club Oradea, formed of Adolf Vecsei-Weber (30 matches), Toth, Ferenc (Francisc) Mészáros (30 matches), Andor Onodi (29 matches), Iosif Petschowsky (22 matches), Nicolae Simatoc (12 matches), Gusztáv Juhász (26 matches), Rudolf Demetrovics (29 matches), Ioan Stiebinger (20 matches), Gyula Loránt (25 matches), Francisc Spielmann-Sárvári (30 matches), Gyula (Iuliu) Bodola (30 matches), Mátyás Tóth III (30 matches), János (Ioan) Kovács II (12 matches), Antal (Anton) Fernbach-Ferenczi (3 matches), Gheorghe Moniac (2 matches), became the first countryside team which won the title of Hungary's champion (1).

In 1942, Iuliu Bodola was chosen the best player in Hungary's championship.

After a short period of time when he played for Ferarul Cluj, he continued his activity as a player in Hungary. Staring with the 1946 championship, until 1950, he played for Magyar Torna Klub Budapest. In the 83 mathes that he played, he scored 35 goals.

In the 176 matches played in Hungary's championship, Iuliu Bodola scored 80 goals, being one of the best scorers.

During December 1st, 1940 and October 3rd, 1948, Iuliu Bodola played 13 times in Hungary's national team, scoring four goals. This way, he is one of the few players who performed in the national teams of two countries, Romania and Hungary (2).

King Charles II Arena, as it was called in the interwar period stadium that teams were battling games division of Crişana and CAO, incumbent Municipal Stadium in November 2008 bearing the name of Juliu Bodola.

Iuliu Bodola as coach.In 1948, after finishing his competitional activity as a player, he started a career as a coach. In his 23 years as a coach, he worked for nine teams, M T K Budapest, M Á V Szolnok, Haladás Szombathely, V S K Pécs, Bányász Komló, S Gyula, V T K Diósgyőr, B T C Salgótarján and Bányász Ormosbánya, which were performing at different competitional levels, from children and junior teams to first division teams (4).

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Figure 3. 1934. Romania's national football team in Sistina training camp (Source: Nicolae Kovács album)

Although he led teams into the first division in 115 matches, his performance and results as a coach were not even close to the level of Iuliu Bodola the player. Maybe his health condition was factor as well. In 1952, when he was the coach of Szombathely he was subjected to a difficult surgery for a cerebral tumor removal. In 1956, in the clinic in Pécs, he was operated on two vertebrae of the spine.

Conclusions

Between 1930 and 1948, Iuliu Bodola played 329 matches in Romania's and Hungary's championships, scoring 182 goals, being one of the representative players of that period.

He was amongst the players who performed both in Romania's and Hungary's national teams. By the number of selections, of scored goals and performance, he was one the representative football players both in Romania and in Hungary.

He was a coach for nine teams of different levels. Although he led teams into the first division in 115 matches, his performance and results as a coach were not even close to those as a player.

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ANTHROPOMETRIC MEASUREMENTS, SOMATOTYPES AND PHYSICAL ABILITIES AS A FUNCTION TO PREDICT THE SELECTION OF TALENTS JUNIOR WEIGHTLIFTERS

EBADA KHALED[1]

ABSTRACT

Purpose. The aim of this study is to investigate the contribution ratios of anthropometric measurements and somatotypes and physical abilities as a function to predict the selection of talented junior weightlifters. The study was carried out on a sample of (205) individual schools and youth centers across the governorates of Egypt, and the average age (11.11 ± 1.06 years), height (143.50 ± 11.09 cm) and weight (42.53 ± 10.74 kg).

Methods. Tests were conducted in the period from 1/7/2009 to 31/04/2010-selected individuals underwent the following tests and measurements (textures and test it to make sure they are free from the distortions skeleton, anthropometric measurements, physical tests, body composition, and initial medical examination Internists, heart , bones, medical tests), the researcher used the descriptive survey method.

Results. The results showed that the anthropometric measurements and physical patterns, body composition and physical abilities contribute in the selection of talented junior weightlifters. And weightlifters talented players are characterized by two types of somatotypes, mesomorph, balanced mesomorph, and mesomorph endomorph.

Conclusions. These results must be taken into account by the Weightlifting Federation and trainers to be used as a signal for the selection of talented junior weightlifters.

Key Words: weightlifters, anthropometric, somatotypes, physical abilities, talents, junior.

Introduction

Weightlifting is one of the most influential sports activities in the world of sport. Consists of lifting snatch and clean & jerk, these activities generate some of the greatest levels of power weightlifting measured in the sport (Garhammer, 1993). A distinctive combination of muscle strength, Explosive power, endurance and weightlifting technique needed for successful performance in the profile of somatotype (Kraemer, Koziris, 1994, Andrew, et al., 2006).

The selection of talented represents in sports in general and weightlifting, private human wealth discovered, developed, nurtured and preserved, the discovery of talented has been subjected to several techniques either by accident or observation, personal experience, or other methods that may lack setting scientific

The right Select for talented junior weightlifting are initial steps heroic superiority. Therefore the concentration of attention on the determinants, capabilities and preparations eligible for the sport of weightlifting, which achieves the economies principle of effort in sports training. Since the high sporting levels achieved by players with physical qualities and abilities appropriate to the type of sports activity patterns, free physical deformities skeleton as one of the basic requirements for sports superiority and creativity. Mesomorphs may be more appropriated in sports that require strength and endurance for each individual sport requirements anthropometric and physical skill.

Talent identification usually monitor several parameters, once of which is anthropometry. There are a variety of anthropometric techniques that are used in talent identification. With respect to youth sport performance, the use of techniques to assist with talent identification and performance within the junior from 10–12 years for boy's phase of growth as competitive sport is not a regular occurrence in children. Using evidence from a variety of study, information has been provided about how sports have used anthropometry and somatotype and physical abilities for talent identification. The weight classified sport weightlifting by a combination of body composition and body size traits which are believed to influence the chance of success in weightlifters sport. Therefore it is suggested that the measurement of anthropometry and somatotype is a crucial tool in the search for information to assist coaches and athletes in the quest for success at the highest level in weightlifting (Sánchez-Muñoz, et al., 2012)

Contrary to common perception, success in weightlifting is not determined by strength alone. A number of additional factors significantly affect the ability of an individual to become a champion weightlifter. A unique profile that combines muscular strength, muscular power, flexibility and lifting

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technique is necessary for successful performances (Kraemer, Koziris, 1994), which must be accompanied by somatotype, physical patterns, body composition and physical abilities to maximize athletic potential. The basic importance of muscular strength, however, cannot be overstated. Among men of international caliber, weight lifted in the Snatch often exceeds twice body mass and, for a very few exceptional athletes, has equaled or exceeded triple body mass in the clean and jerk (Musser, 2010).

It was important to characterization somatotypes players different ways so that including the method Carter - Hath as this characterization contributes to the development signs correlation between the type of somatotype and configurations contribute to this characterization and development of motor skills and skill for juniors in ages (10-12) years in order to installed and development vital to the efficiency of a comprehensive fitness elements of public. Private activity practitioner skill and proficiency, technical and tactical associated with the somatotype of players, which could have an impacted in making the heroic level and influence in reducing the rate of infection associated with sports activity (Fiesel 2000, Gaines, 2001, Shaban, et al., 2006).

The selection process is built on the basis of predictive guided physical standards whether anthropometric or body composition function somatotypes along with some physical abilities and motor signs Level and skill of the players with a heroic level global, international and Olympic. Allowing interaction of these factors in the predictive equations can guide in the selection talent junior weightlifter, which could achieve the economies principle of human effort in the field of sports training (Suchomel, 2001).

While there are some countries which do not bother selection process for children and youth Weightlifter such as Egypt, but children come to the club to practice weightlifting by their desires, and on the contrary, there is a selection of the types of other sports such as swimming, wrestling (Shaban, et al., 2006, Lewandowska, et al., 2011, Ebada, 2012).

In recent years, offering the level of performance of the Weightlifter until they reached the athletic levels was improved Make gold medals and win championships world have achieved Egypt gold medal at the Olympics last Beijing 2008, London 2012 and today it has become hard to beat competition only through selection and good planning for talented junior weightlifters. This planning and the rapid development of sport today is due to the experts in the sport of weightlifting to solve new problems in the training and selection process good weightlifters, you must specify the somatic patterns and anthropometric measurements, body composition and physical abilities to talented junior weightlifter (Yordan, 1975, Ebada, 2012).

They noted the research through its expertise in the field of Weightlifting and brief him on the studies and scientific research and specialized reference that there is a dearth of scientific studies in the field of selection talented junior weightlifters, promoting the researcher to conduct this study to determine ratios contribution anthropometric measurements, somatotypes and physical abilities as a function to predict the selection of talents junior weightlifters (Musser, 2010).

Method

The study was carried out on a sample of (205) individual schools and youth centers across the governorates of Egypt, and the average age (11.11 ± 1.06 years), height (143.50 ± 11.09 cm) and weight (42.53 ± 10.74 kg).

Tests were conducted in the period from 1/7/2009 to 31/04/2010-selected individuals underwent the following tests and measurements (textures and test it to make sure they are free from the distortions skeleton, anthropometric measurements, physical tests, body composition, and initial medical examination Internists, heart , bones, medical tests), the researcher used the descriptive survey method.

The age of each subject was calculated from the date of birth as recorded in his institute. The height of the subjects was measured with anthropometric rod to the nearest 0.5 cm (Gaurav, et al., 2010).

Tools and devices used are as follows: a Body Composition Analyzer available by a factor of college to analyze body composition (Weight .BMI, FAT%, Fat mass, FFM, TBW,), Skinfold caliper measurement (Triceps, Subscapular, Supraspinale) and tape flexible to measure girths (Arm, Calf), a Skeletal Anthropometric to measure lengths for (Upper trunk, Arm's, Leg, Foot , Desist) and Femur breadth (Ebada, 2003) , tests and physical measurements speed (60 m Sprints test), Ability (standing long jump test), strength (Throwing Medicine Balls test),and endurance (800 m running test) (Shaban, et al., 2006) , Laptop, how to determine Somatotype (Stepnicka, 1986), method of determining individual games (Ross, et. al., 1989). Way to determine Somatotype to (Carter, Heath, 1990) mathematical equations, is determined Somatotypes were calculated by the following formulae: endomorph = - 0.7182 + 0.1451 (X) - 0.00068 (X2) + 0.0000014 (X3). where X = (sum of triceps, subscapular and supraspinale skinfolds) multiplied by (170.18/height in cm). This is called height-corrected endomorph and is the preferred method for calculating endomorph. The equation to calculate mesomorph is: mesomorph = 0.858 x humerus breadth + 0.601 x femur breadth + 0.188 x corrected arm girth + 0.161 x corrected calf girth – height 0.131 + 4.5. Three different equations are used to calculate ectomorph according to the height-weight ratio: If HWR is greater than or equal to 40.75 then. ectomorph = 0.732 HWR - 28.58 If HWR

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is less than 40.75 but greater than 38.25 then. ectomorph = 0.463 HWR - 17.63. If HWR is equal to or less than 38.25 then. ectomorph = 0.1 (Carter, Heath, 1990)
Statistical analysis: SPSS was used to apply formulas statistical by calculating: average, standard deviation, correlation, stepwise regression.

Results

Table 1. Shows the arithmetic mean and standard deviation of some Anthropometric characteristics, body composition and physical abilities and different types of talented junior weightlifters, where the average lengths between (16.55 ± 1.71 cm - 71.86 ± 5.56 cm). As average breadths between (6.88 ± 0.84 cm - 10.10 ± 1.06 cm). As the average girths between (21.84 ± 3.61 mm - 28.64 ± 2.89 mm). Also shows the average body composition, where averages ranged from (9.64 ± 5.74 kg - 20.66 ± 3.44 kg/m^2) fat mass and BMI. While the average physical abilities between (4.18 ± 14.63 min - 622.07 ± 154.66 cm). The average Somatotypes of talented junior weightlifters (550.17 ± 200.46) for members of the research sample.

Table 1. Descriptive Statistics for Anthropometric measurements, Body Composition, Physical abilities and Somatotypes of talents junior weightlifters

N=205

Variable		Mean	Std. Deviation	Minimum	Maximum
Anthropometric measurements	Age (years)	11.11	± 1.07	8.00	12.00
	Weight (kg.)	42.53	± 10.75	22.50	79.60
	Height (cm)	143.50	± 11.09	120.00	175.00
	Upper trunk length (cm)	71.86	± 5.56	55.00	86.00
	Arm's length (cm)	63.15	± 6.86	51.00	85.00
	Leg length (cm)	84.87	± 7.89	68.00	101.00
	Foot length (cm)	23.48	± 2.01	18.00	28.00
	Desist length (cm)	16.55	± 1.71	12.50	20.00
	Humerus breadth (cm)	6.88	± 0.84	5.00	9.00
	Femur breadth (cm)	10.14	± 1.06	5.00	12.00
	Arm girth (mm)	21.84	± 3.61	5.00	29.00
	Calf girth (mm)	28.94	± 2.89	19.00	36.00
	Triceps skinfold (mm)	9.89	± 3.93	3.00	25.00
	Subscapular skinfold (mm)	8.57	± 3.91	3.00	25.00
	Supraspinale skinfold (mm)	10.54	± 5.12	2.00	30.00
Body Composition	BMI (kg/m^2)	20.66	± 3.44	14.90	36.30
	FAT %	19.79	± 8.89	1.40	52.80
	Fat mass (kg.)	9.64	± 5.74	.30	28.00
	FFM (kg.)	33.94	± 6.91	20.00	47.30
	TBW (kg.)	25.36	± 5.58	14.00	43.60
Physical abilities	Speed (sec.)	9.96	± 1.02	8.02	14.00
	Endurance (min)	4.18	± 14.63	1.36	151.00
	Ability (cm.)	159.25	± 30.98	1.75	211.00
	Strength (cm)	622.07	± 154.66	250.00	1006.00
Somatotypes	Ectomorph	2.46	± 1.41	1	7
	Mesomorph (cm)	6.77	± 1.02	4	9
	Endomorph (mm)	4.81	± 1.96	1	9
	Somatotype	550.17	± 200.46	153	981

Table 2. Indicates to a number (190) correlation coefficient number (150) positive correlation coefficient increased by 78.94%, and the number (50) negative correlation coefficient increased by 21.06%. There are (140) transactions positive statistically significant at the level of significance (0.01) by 73.68%. There are (10) transactions positive statistically significant at the significance level (0.05) by 5.26%. There are a number (20) a positive correlation coefficient is statistically significant rate of 10.52%. And that there are positive relationships between anthropometric measurements, body composition, physical abilities and Somatotypes (Mesomorph - Endomorph), and Somatotype of talented junior weightlifters.

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Table 2. Correlation between Anthropometric measurements, Body Composition, Physical abilities, and Somatotypes for the selection of talents junior weightlifters

(N=205)

Variable	Age (yare)	Weight (kg.)	Height (cm)	Upper trunk length (cm)	Arm's length(cm)	Leg length (cm)	Foot length (cm)	Desist length(cm)	BMI (kg/m2)	FAT %	Fat mass (kg.)	FFM (kg.)	TBW (kg.)	Speed (s.)	Endurance (min)	Ability (cm.)	Strength (cm)	Mesomorphy (cm)	Endomorphy (mm)	Somatotype
Age (yare)																				
Weight (kg.)	.571**																			
Height (cm)	.630**	.902**																		
Upper trunk length (cm)	.536**	.738**	.781**																	
Arm's length(cm)	.484**	.646**	.691**	.591**																
Leg length (cm)	.582**	.750**	.791**	.658**	.505**															
Foot length (cm)	.564**	.675**	.720**	.640**	.557**	.685**														
Desist length(cm)	.752**	.564**	.597**	.484**	.533**	.517**	.644**													
BMI (kg/m^2)	.265**	.680**	.482**	.504**	.350**	.564**	.541**	.354**												
FAT %	.092	.252**	.141*	.142*	.109	.261**	.255**	.130	.575**											
Fat mass (kg.)	.330**	.674**	.532**	.507**	.405**	.548**	.473**	.383**	.769**	.757**										
FFM (kg.)	.484**	.551**	.606**	.516**	.552**	.487**	.488**	.475**	.169*	-.068	.221**									
TBW (kg.)	.513**	.720**	.741**	.629**	.642**	.595**	.550**	.530**	.299**	-.172*	.339**	.854**								
Speed (sec.)	-.549**	-.398**	-.401**	-.341**	-.250**	-.432**	-.517**	-.386**	-.302**	-.264**	-.282**	-.308**	-.306**							
Endurance (min)	.082	-.047	-.051	-.035	-.117	-.016	-.071	-.030	-.136	.048	-.020	-.075	-.078	-.139*						
Ability (cm.)	.328**	.192**	.272**	.202**	.201**	.221**	.299**	.257**	.004	.101	.053	.353**	.313**	-.463**	.014					
Strength (cm)	.575**	.347**	.342**	.218**	.199**	.327**	.380**	.490**	.086	.083	.185**	.210**	.266**	-.474**	.139*	.336**				
Mesomorph (cm)	-.143*	.092	-.014	-.005	-.023	.000	.049	-.056	.226**	.112	.097	.007	-.034	.057	-.073	-.217**	-.135			
Endomorph (mm)	.158*	.490**	.315**	.331**	.203**	.332**	.186**	.169*	.509**	.249**	.499**	.185**	.279**	-.057	-.038	-.186**	.131	.391**		
Somatotype	.154*	.491**	.315**	.332**	.207**	.331**	.189**	.174*	.516**	.252**	.497**	.191**	.280**	-.053	-.041	-.192**	.112	.444**	.993**	

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

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Table 3
Thecontribution percentage for Anthropometric measurements, Body Composition, Physical abilities, and Somatotypes as a function to predict the selection of talents junior weightlifters

n=205

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Contribution Rate %	Sum Contribution Rate %
		B	Std. Error	Beta				
Somatotype (Constant)		-69.704	66.251		-1.052	.294		
Anthropometric measurements	Age (yare)	2.523	3.367	.012	.749	.455	42.44	
	Weight (kg.)	.153	.556	.008	.275	.784		
	Height (cm)	-.103	.517	-.006	-.199	.842		
	Upper trunk length (cm)	.378	.520	.011	.727	.468		
	Arm's length(cm)	-.003	.365	.000	-.008	.994		
	Leg length (cm)	.011	.399	.000	.027	.979		
	Foot length (cm)	-1.634	1.503	-.016	-1.087	.278		
	Desist length(cm)	1.820	1.820	.015	1.000	.319		
Body Composition	BMI (kg/m2)	.362	1.061	.006	.342	.733	5.60	98.91
	FAT %	.547	.604	.025	.906	.367		
	Fat mass (kg.)	-.821	.988	-.024	-.831	.407		
	FFM (kg.)	-.238	.599	-.008	-.396	.692		
	TBW (kg.)	.954	1.151	.027	.829	.408		
Physical abilities	Speed (sec.)	.810	2.388	.004	.339	.735	7.03	
	Endurance (min)	.045	.117	.003	.384	.702		
	Ability (cm.)	-.025	.071	-.004	-.353	.724		
	Strength (cm)	-.025	.017	-.017	-1.507	.134		
Somatotypes	Mesomorph (cm)	97.934	1.304	.958	75.098	.000	43.50	
	Endomorph (mm)	13.916	1.955	.068	7.119	.000	0.34	

Table (3) Shows that the height is the first contribution Somatotypes (Mesomorph, Endomorph) with the contribution percentage 43.84% and Mesomorph with the contribution percentage 43.50%, the second contribution is the Anthropometric measurements with contribution percentage was 42.44%, while the Physical abilities was the third contributor with contribution percentage 7.03%, while the Body Composition was the fourth contributor with contribution percentage 7.03%. for that the predictive formula to predict the selection of talented junior weightlifters by indicating somatotypes, anthropometric measurements and physical abilities and Body Composition = -69.704 + Mesomorph (97.934) + Endomorph (13.916) + Age (2.523) + Weight (.153) + Height (-.103) + Upper trunk length (.378) + Arm's length (-.003) + Leg length (.011) +Foot length (-1.634) + Desist length (1.820) + Speed (.810) + Endurance (.045) + Ability (-.025) + Strength (-.025) + BMI (.362) + FAT % (.547) + Fat mass (-.821) + FFM (-.238) +TBW (.954).

Discussion

This study reached to characteristics Anthropometric of lengths, breadths, girths, skinfold and body composition of the stage year from 11-12 years for use when selecting talented weightlifting beginners and average body mass of the sample search is 20.66 kg / m 2, a guide suits cm on weight for individuals and comparing rate body mass at this stage year ranging between 16.5 - 22 kg/m^2 and indicates that there is an inconsistency between the height and weight of the search-selected sample. This is consistent with what (Kromeyer, et al., 2001).

The results also showed that the physical ability of the age group of 10 - 12 years the average speed (9.96 ± 1.02 sec.), average endurance (4.18 ± 14.63 min), average ability(159.25± 30.98 cm) and average strength (622.07± 154.66 cm), as well as the average. This indicates the presence of physical abilities at this stage Sunni and you need to develop speed and ability, strength and endurance through the development of training programs for individuals-selected and prepare them physically and skill to reach levels high and sports achieve Olympic medals. (Carter, Heath, 1990), the high sporting levels achieved by players with physical qualities and capabilities suitable for the type of physical activity is the most important somatotypes.

The results of the study indicate a positive relationship between the muscular style, style, fat and physical patterns of talented junior weightlifting. This means that the more mesomorph - endomorph greater predict somatotypes to select talented junior weightlifting (Ebada, 2006, Abbas, Mohsen, 2006) that the greater the size and weight of the body, the more the level of performance of the weightlifting players.

In this study talented junior weightlifters had a similar mean somatotype profile; Ectomorph- Mesomorph-Endomorph (2.46–6.77–4.81) as elite weightlifters

(1.38–5.47–3.23) in (Imran, et al., 2011) but they had a higher level of mesomorph.

The study found that there are four factors that influence the selection of talented weightlifting beginners and are somatotype (Mesomorph - Endomorph) contribute by (43.84%), Characteristics Anthropometric age, height, weight, height, of the trunk - arm's length - leg length - foot length, Desist length, and Upper trunk length) and contribute by (42.44%) and body components contribute by (5.60%) special and physical abilities explosive power, strength and endurance and contribute by (7.03%) (F. Andrew, at el, 2006**)**. And predict selection of talented junior weightlifters through the following formula = -69.704 + Mesomorph (97.934) + Endomorph (13.916) + Age (2.523) + Weight (.153) + Height (-.103) + Upper trunk length (.378) + Arm's length (-.003) + Leg length (.011) +Foot length (-1.634) + Desist length (1.820) + Speed (.810) + Endurance (.045) + Ability (-.025) + Strength (-.025) + BMI (.362) + FAT % (.547) + Fat mass (-.821) + FFM (-.238) +TBW (.954). The results of this study agree with what was said (Ross at el. 1989, J. Carter, H. Heath, 1990, and reached the results of some study both (Fiesel 2000, Gaines, 2001, Suchomel, 2001, Stewart, et al., 2003). Where it has proven that it can predict the type of sports activity and athletic levels high through somatotypes free of distortions skeleton and interest elements promising and prepared physically and skill development training programs appropriate stages year's and reach to athletic levels high for gold medals at the Olympics.

It should be noted, however, that none of the anthropometric measures were significant discriminators in the present study. Success in many different sporting activities would most likely be dependent on part on muscular strength and power and on Somatotype and composition. As a consequence, those responsible for talent identification for other sports might also be interested in these characteristics. However, the inclusion of measures specific to weightlifting in the regression equation, such as anthropometric weight , height, BMI, somatotypes, performance for snatch and clean & jerk makes the resulting test battery unique to this sport. (Andrew, et al., 2006, Ebada 2006**)**.

Conclusion

Anthropometric measurements and somatotypes, physical abilities, and body composition influential factors to predict the selection of talented junior weightlifters and predictable significance from the following formula= -69.704 + Mesomorph (97.934) + Endomorph (13.916) + Age (2.523) + Weight (.153) + Height (-.103) + Upper trunk length (.378) + Arm's length (-.003) + Leg length (.011) +Foot length (-1.634) + Desist length (1.820) + Speed (.810) + Endurance (.045) + Ability (-.025) + Strength (-.025) + BMI (.362) + FAT % (.547) + Fat mass (-.821) + FFM (-.238) +TBW (.954).

These results must be taken into account by the Weightlifting Federation and trainers to be used as a signal for the selection of talented junior weightlifters.

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THE EFFECT OF DEVELOPMENT OF MUSCULAR BALANCE ON SOME DYNAMIC PARAMETERS AND LEVEL OF ACHIEVEMENT FOR CLEAN AND JERK SKILL FOR WEIGHTLIFTERS

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Abstract

Purpose. This study aims to determine the impact of the development of muscular balance on the dynamics of performance and level of achievement for Clean and jerk skill for weightlifters. And applied study on a sample of (10) weightlifters with the upper levels, and the average age (18.80 ± 6.37 years), height (160.80 ± 9.31 cm) and weight (75.72 ± 12.67 kg) and age training (7.20 ± 4.54 years) of the experimental group, while the average age (19.60 ± 3.50 years), height (168.80 ± 8.16 cm) and weight (81.08 ± 14.12 kg) for the control group. The researchers used the experimental approach, they designed two groups, one experimental of (5) players and the other controlled of (5) players.

Methods. The experimental group underwent to the proposed training program, which contains similar exercises for

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motor performance skill Clean and jerk and development exercises muscular balance involved in skill. The control group underwent traditional training program. The training program of muscular balance Continued for three months (3 per week) and the training session lasted 2 hours. The pre and post photograph for the two control and experimental used a video camera Brand Panasonic, frequency 25 frames in the second. The analysis of motor used Maxtraq on line Manual Version 5.5, physical and performance tests.
Results. There were statistically significant differences between the experimental and control groups in muscular balance and dynamic performance parameters Clean and jerk skill. The effectiveness of the training program to increase muscular balance, improved dynamic performance and the level of achievement of the weightlifters.
Conclusions. These results must be taken into account by the coaches and weightlifters for the development of muscular balance for improved dynamic performance and the level of achievement for Clean and jerk skill.
Key Words: Weightlifters, Training, Muscular balance, Clean and jerk, Dynamic parameters.

Introduction

In Olympic Weightlifting, there are two Olympic lifts, the clean and jerk and the snatch. Mastery of these lifts develops the squat, deadlift, power clean and split jerk while integrating them into a single movement of unequaled value in all of strength, Muscular balance and conditioning. The Olympic lifters are without a doubt the world's strongest athletes. These lifts train athletes to effectively activate more muscle fibers more rapidly than through any other modality of training. The explosiveness that results from this training is of vital necessity to every weightlifter (Glassman, 2010).

Muscle balance is a vital component to injury prevention. Whether you choose to lift weights or calisthenics to maintain muscle strength and endurance, you need to focus on muscle balance. The major muscle group's work in pairs and those muscle pairs need to be balanced in terms of strength and flexibility. For example, we bend our elbow by using the biceps muscle. Its pair is the triceps muscle. The triceps muscle must be willing to stretch for the bicep muscle to contract and bend the elbow fully (Zatsiorsky, Prilutsky, 2012).

Biomechanics is the science involved in understanding the effects of applied internal and external forces on a person's body. When it comes to sports and fitness training, application of body mechanics means the use of proper form when weightlifting (McGinnis 2013, Greene, Roberts, 2005).

The amount of work (W) is obtained by multiplying the force (F) by the distance (H) over which it acts to raise a weight of mass (m) kilograms, you must apply a force of (m*g) Newton to overcome the gravitational acceleration (g) (McGinnis 2005, Greene, Roberts, 2005, Baechle, Earle, 2008, Arus, 2013).

There is also a need to investigate less skillful performers. In particular, the regulation of balance may be a limiting factor in both safety of lifting and improvement of skill. For example forward-backward stability must be maintained by keeping the line of gravity of the body bar system over the anteroposterior base of support side-to-side, stability must be maintained through sufficient left right symmetry to keep the line of gravity located over the mediolateral base of support and forward-backward mobility must be adjusted to allow the greatest application of muscle torque. Given the potentially conflicting needs for stability and mobility in the anteroposterior plane and the need for left-right symmetry in the mediolateral plane, it is likely that performers of disparate skill levels resolve these challenges in different manners (Frank, Jackie, 2003).

The lifts develop core strength like nothing else. They work a vast array of muscles to achieve a muscular balance between the front and back muscles of the body. This contrasts with many sports and daily activities that under develop the back, abdominal and scapular muscles and overdevelop shoulder and pectoral muscles. Most don't realize it, but Olympic weightlifting has one of the lowest injury rates of all sports. One key component that often gets overlooked is muscle balance. Probably the most commonly seen muscle imbalance that results from weightlifting is inadequate rhomboid and middle trapezius muscle mid-back exercises in relation to pectoral or chest exercises. The result is short and strong pectoral chest muscles, and over-lengthened and weak mid-back muscles resulting in forward rounded shoulders. These forward rounded shoulders can be the source of numerous pain syndromes in the shoulders (Heitkamp et. al., 2001), or weakness in the muscles of the group the right or left side of the weightlifters, which affects the level of performance.

To improve the level of performance that must be addressed by taking into account the balance of muscle is the primary focus of any weightlifting program. Once the imbalance is created, it becomes increasingly difficult to reverse the longer and neglected muscles.

The elevation of Clean and jerk skill requires high muscular balance of weightlifters to accomplish and shows through dynamic analysis of the skill during performance, it also requires a lot of training to reach the technical performance optimization to develop the skill to accomplish the maximum weight of the weightlifters can be lifted. The researchers have observed through his experience in the field of weightlifting and biomechanics that there is a tendency

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in the bar raised on one side during the performance of the weightlifters to raise Clean and jerk which affects the level of achievement of the elevation. Prompting researchers to conduct this study aims to determine the impact of the development of muscular balance on the dynamics of performance and level of achievement for Clean and jerk skill for weightlifters.

Methods

The study was conducted applied on a sample of (10) weightlifters with the upper levels, and the average age (18.80 ± 6.37 years), height (160.80 ± 9.31 cm) and weight (75.72 ± 12.67 kg) and age training (7.20 ± 4.54 years) of the experimental group, while the average age (19.60 ± 3.50 years), height (168.80 ± 8.16 cm) and weight (81.08 ± 14.12 kg) for the control group. The researchers used the experimental approach, they designed two groups, one experimental of (5) players and the other controlled of (5) players.

The experimental group underwent the proposed training program, which contains similar exercises for motor performance Clean and jerk skill and development exercises muscular balance involved in skill. The control group underwent to traditional training program. The training program of muscular balance Continued for three months (3 per week) and the training session lasted 2 hours (Lukjanow, Falamejow, 1972, Carl, 1976, Lear, 1991, Ebada, 2003).

The training program of Experimental group aims to develop of the muscular balance related to Clean and jerk skill for weightlifters, where it continued for (12) weeks of (3) units per week, where the weightlifters executed the program in preparation period by applying circle training (Appendix 1).

The researchers to measure muscular balance, dynamic parameters and performance level of Clean and jerk skill sample individuals who search through reference survey done by the researchers for reference the research in weightlifting sport to determine methods of measuring the maximum level of achievement Clean and jerk skill, who were possible to the following tests that have been used in many research's and studies and tests (Right grip, Left grip, Clean pull, Jerk push, Good Morning, Snatch balance) (N. Hori et. al., 2006, Hamlyn et. at., 2007, Robert et. al., 2008, Ebada, 2011). Dynamic parameters were measured for control and experimental group by using pre and post photography by a video camera Brand Panasonic of frequency 25 Field / sec .which has been filmed from the front to see how bar inclined from a straight line as the Figure 1

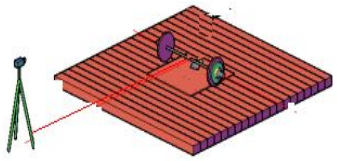

Figure 1. Position of the camera during filming

Figure 2. Sequence pictures to perform a clean -and jerk skill

The researchers analyzed motor skill of study for members of the experimental and control groups in both pre and post measurements, where (20) attempts were analyzed by using a program (MAX TRAQ) Online Manual Version 2.2 for dynamic analysis According to the following dynamic model Figure 3:

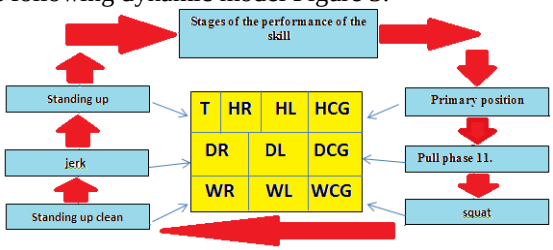

Figure 3. Dynamic model of the dynamic parameters to stages of skill Performance of study.

Time(T) have been identified to each stage of the performance and the height of the bar was measure from the ground to the right sides (HR) and left (HL) and height of body mass center of gravity (HCG) on the ground to each stage of the performance as the Figure 4:

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Figure 4. The height of the bar above the ground from the right sides (HR) and left (HL) and height of body mass center of gravity (HCG).

Vertical distance was also measured to both sides of the bar right (DR) and left (DL) and the vertical distance of the body mass center of gravity (DCG) in each stage for the stage that followed as the form 5:

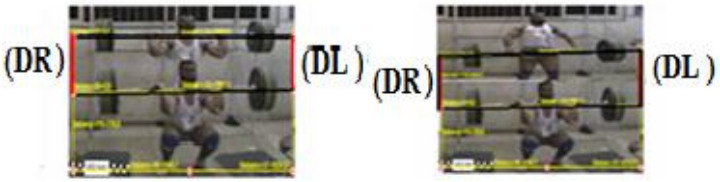

Figure 5. Vertical distance to both sides of the bar right (DR) and left (DL).

Mechanical work was calculated for the left (WL) and right (WR) side of the bar and the body's center of gravity by the following equations
WR = (DR * F) where (F) = raised weight /2*(9.8)
WL = (DL * F) where (F) = raised weight /2*(9.8).
WCG = (DCG * F) where (F) = (raised weight + body weight) * (9.8).
The statistical analysis of the control and experimental data SPSS was used to apply formulas statistical by calculating: average, standard deviation, Mann-Whitney and Wilcoxon test.

Results

Table 1. Statistics-test for the muscular balance and dynamic parameters of Mann - Whitney between Experimental and Control group to pretest.

Variables			Experimental group		Control group		z.	p.
			Average	SD.	Average	SD.		
Muscular balance	Right grip	Kg.	34.000	1.732	32.600	2.191	-1.514	0.130
	Left grip	Kg.	32.400	1.140	31.600	2.074	-1.064	0.287
	Clean pull	Kg.	178.000	54.955	113.000	28.636	-1.681	0.093
	Jerk push	Kg.	70.000	15.588	56.200	8.585	-1.152	0.249
	Good Morning	Kg.	99.600	27.970	73.200	14.822	-1.567	0.117
	Snatch balance	Kg.	138.000	28.522	107.000	11.979	-1.786	0.074
Pull phase 11.	T	Sec.	0.732	0.098	0.784	0.083	-0.946	0.344
	HR	cm.	72.518	1.307	75.518	2.745	-1.676	0.094
	HL	cm.	75.792	2.685	76.068	3.311	-0.522	0.602
	HCG	cm.	75.558	2.867	76.080	3.416	-0.419	0.675
	WR	n.m.	316.711	67.624	251.501	34.027	-1.358	0.175
	WL	n.m.	337.394	73.231	254.930	41.045	-1.567	0.117
	WCG	n.m.	757.158	115.291	649.682	96.038	-1.567	0.117
Squat	T	Sec.	0.696	0.083	0.712	0.052	-1.006	0.314
	HR	cm.	60.542	4.443	56.524	4.351	-1.358	0.175
	HL	cm.	64.660	2.917	64.042	3.314	-0.104	0.917
	HCG	cm.	24.790	3.880	24.190	4.265	-0.105	0.916
	WR	n.m.	74.251	22.167	89.027	12.856	-1.358	0.175
	WL	n.m.	68.544	19.809	57.898	21.881	-0.940	0.347
	WCG	n.m.	975.450	128.192	843.960	82.857	-1.567	0.117
Standing up clean	T	Sec.	1.296	0.151	1.316	0.127	-0.541	0.589
	HR	cm.	132.736	0.853	134.134	1.826	-1.358	0.175
	HL	cm.	133.752	1.010	133.792	0.921	-0.104	0.917
	HCG	cm.	74.408	2.945	73.418	2.974	-0.838	0.402
	WR	n.m.	454.397	85.149	368.377	52.805	-1.776	0.076
	WL	n.m.	434.845	78.409	332.016	55.996	-1.776	0.076
	WCG	n.m.	961.118	174.338	809.285	137.565	-1.358	0.175
Jerk	T	Sec.	1.088	0.125	1.120	0.110	-0.632	0.527
	HR	cm.	164.174	3.976	160.644	5.370	-1.358	0.175
	HL	cm.	165.122	6.702	161.322	5.022	-1.358	0.175
	HCG	cm.	67.304	3.130	65.304	1.581	-0.946	0.344
	WR	n.m.	201.884	59.207	127.595	34.584	-1.776	0.076
	WL	n.m.	200.511	67.539	131.220	34.399	-1.776	0.076
	WCG	n.m.	146.395	124.222	140.002	84.258	-0.522	0.602
Standing up	T	Sec.	1.168	0.222	1.120	0.251	-0.961	0.337
	HR	cm.	183.210	3.640	179.410	5.731	-1.149	0.251

	HL	cm.	185.872	3.831	181.710	5.187	-1.149	0.251
	HCG	cm.	81.002	3.991	79.802	4.752	-0.731	0.465
	WR	n.m.	119.995	23.117	89.053	12.203	-1.776	0.076
	WL	n.m.	131.383	42.970	105.150	30.786	-0.522	0.602
	WCG	n.m.	277.596	155.045	244.679	103.105	-0.104	0.917
Performance	Clean & Jerk	Kg.	129.000	26.192	97.000	14.036	-1.567	0.117

The Z= value ±1, 96 at the level of 0.05 (double sided)

Table 1. Significant statistical differences of Mann-Whitney test in the pretest of muscular balance, dynamic parameters and the level of achievement for clean and jerk skill between the experimental and control groups. Where the value of P <0.05 in all variables indicating the absence of significant differences between the two groups points to the equal sample before executing experiment.

Table 2. Statistics-test for the Muscular balance and dynamic parameters of Wilcoxon between pre-and post-test to the experimental group.

Variables			**Pre-test**		**Post-test**		**z.**	**p.**
			Average	**SD.**	**Average**	**SD.**		
Muscular balance	Right grip	Kg.	34.000	1.732	40.600	2.408	-2.032	0.042*
	Left grip	Kg.	32.400	1.140	39.600	1.817	-2.060	0.039*
	Clean pull	Kg.	178.000	54.955	189.000	56.613	-2.121	0.034*
	Jerk push	Kg.	70.000	15.588	79.000	15.166	-2.060	0.039*
	Good Morning	Kg.	99.600	27.970	106.000	27.019	-2.032	0.042*
	Snatch balance	Kg.	138.000	28.522	147.000	28.636	-2.041	0.041*
Pull phase 11.	T	Sec.	0.732	0.098	0.656	0.062	-1.633	0.043*
	HR	cm.	72.518	1.307	85.374	2.287	-1.214	0.043*
	HL	cm.	75.792	2.685	87.606	2.292	-1.753	0.043*
	HCG	cm.	75.558	2.867	87.412	1.527	-1.753	0.043*
	WR	n.m.	316.711	67.624	410.264	95.167	-2.023	0.043*
	WL	n.m.	337.394	73.231	433.561	102.709	-2.023	0.043*
	WCG	n.m.	757.158	115.291	940.043	178.845	-2.023	0.043*
Squat	T	Sec.	0.696	0.083	0.760	0.075	-1.841	0.039*
	HR	cm.	60.542	4.443	66.618	3.212	-1.214	0.043*
	HL	cm.	64.660	2.917	67.606	2.573	-1.753	0.043*
	HCG	cm.	24.790	3.880	33.406	5.539	-1.483	0.043*
	WR	n.m.	74.251	22.167	124.887	18.187	-0.674	0.043*
	WL	n.m.	68.544	19.809	132.794	16.360	-2.023	0.043*
	WCG	n.m.	975.450	128.192	1082.566	124.243	-2.023	0.043*
Standing up clean	T	Sec.	1.296	0.151	1.008	0.168	-2.060	0.043*
	HR	cm.	132.736	0.853	134.574	1.006	-1.753	0.043*
	HL	cm.	133.752	1.010	134.666	0.830	-1.225	0.043*
	HCG	cm.	74.408	2.945	83.034	1.604	-1.753	0.043*
	WR	n.m.	454.397	85.149	457.196	75.393	-2.023	0.686
	WL	n.m.	434.845	78.409	451.412	75.069	-2.023	0.043*
	WCG	n.m.	961.118	174.338	995.063	109.214	-2.023	0.345
Jerk	T	Sec.	1.088	0.125	0.944	0.096	-0.816	0.042*
	HR	cm.	164.174	3.976	172.088	3.216	-2.023	0.043*
	HL	cm.	165.122	6.702	171.038	3.986	-2.023	0.080
	HCG	cm.	67.304	3.130	69.768	2.332	-2.023	0.043*
	WR	n.m.	201.884	59.207	256.628	67.509	-2.023	0.043*
	WL	n.m.	200.511	67.539	248.596	65.591	-2.023	0.043*
	WCG	n.m.	146.395	124.222	272.723	101.595	-1.753	0.043*
Standing up jerk	T	Sec.	1.168	0.222	1.040	0.228	-1.841	0.039*
	HR	cm.	183.210	3.640	192.810	3.282	-1.483	0.043*
	HL	cm.	185.872	3.831	192.966	3.377	-2.023	0.043*
	HCG	cm.	81.002	3.991	84.028	3.487	-2.023	0.043*
	WR	n.m.	119.995	23.117	139.458	23.765	-0.405	0.043*
	WL	n.m.	131.383	42.970	147.260	24.564	-0.405	0.138
	WCG	n.m.	277.596	155.045	300.799	150.663	-1.753	0.043*
Performance	Clean & Jerk	Kg.	129.000	26.192	138.000	26.589	-2.121	0.039*

Table 2. Shows the results of significant statistical differences to Wilcoxon test the experimental group between pre and post measurements in tests of muscular balance, dynamic parameters and the level of achievement for clean and jerk skill. Where the value of P <0.05 to all variables search which shows statistically significant differences between pre and post measurement for post measurement.

Table 3. Statistics-test for the Muscular balance and dynamic parameters of Wilcoxon between pre- and post-test to control group.

Variables			Pre-test		Post-test		z	p.
			Average	SD.	Average	SD.		
Muscular balance	Right grip	Kg.	32.600	2.191	35.400	2.302	-2.121	0.034*
	Left grip	Kg.	31.600	2.074	34.600	2.074	2.060-	0.039*
	Clean pull	Kg.	113.000	28.636	116.800	28.969	-2.121	0.034*
	Jerk push	Kg.	56.200	8.585	59.800	8.843	-2.070	0.038*
	Good Morning	Kg.	73.200	14.822	76.600	15.060	-2.070	0.038*
	Snatch balance	Kg.	107.000	11.979	111.000	12.942	-2.041	0.041*
Pull phase 11.	T	Sec.	0.784	0.083	0.764	0.064	-1.633	0.102
	HR	cm.	75.518	2.745	76.174	3.674	-1.214	0.225
	HL	cm.	76.068	3.311	77.944	3.409	-1.753	0.080
	HCG	cm.	76.080	3.416	77.612	3.476	-1.753	0.080
	WR	n.m.	251.501	34.027	262.839	34.933	-2.023	0.043*
	WL	n.m.	254.930	41.045	272.296	40.947	-2.023	0.043*
	WCG	n.m.	649.682	96.038	689.743	104.515	-2.023	0.043*
Squat	T	Sec.	0.712	0.052	0.668	0.069	-1.841	0.660
	HR	cm.	56.524	4.351	57.134	4.743	-1.214	0.225
	HL	cm.	64.042	3.314	64.784	3.240	-2.023	0.043*
	HCG	cm.	24.190	4.265	24.806	5.095	-1.483	0.138
	WR	n.m.	89.027	12.856	92.258	19.549	-0.674	0.500
	WL	n.m.	57.898	21.881	65.066	20.310	-1.753	0.080
	WCG	n.m.	843.960	82.857	874.992	86.857	-2.023	0.043*
Standing up clean	T	Sec.	1.316	0.127	1.244	0.078	2.060-	0.039*
	HR	cm.	134.134	1.826	135.044	2.286	-1.753	0.080
	HL	cm.	133.792	0.921	134.320	1.251	-1.225	0.221
	HCG	cm.	73.418	2.974	77.408	4.674	-1.753	0.080
	WR	n.m.	368.377	52.805	382.051	53.134	-2.023	0.043*
	WL	n.m.	332.016	55.996	354.389	48.295	-2.023	0.043*
	WCG	n.m.	809.285	137.565	879.612	141.924	-2.023	0.043*
Jerk	T	Sec.	1.120	0.110	1.136	0.083	-0.816	0.414
	HR	cm.	160.644	5.370	164.088	5.581	-2.023	0.043*
	HL	cm.	161.322	5.022	162.638	4.750	-2.023	0.043*
	HCG	cm.	65.304	1.581	66.568	2.124	-1.753	0.080
	WR	n.m.	127.595	34.584	144.481	37.546	-2.023	0.043*
	WL	n.m.	123.968	30.979	139.506	37.048	-2.023	0.043*
	WCG	n.m.	140.002	84.258	188.124	111.835	-2.023	0.043*
Standing up	T	Sec.	1.120	0.251	1.076	0.239	-1.841	0.660
	HR	cm.	179.410	5.731	182.010	3.153	-1.483	0.138
	HL	cm.	181.710	5.187	183.566	4.479	-2.023	0.043*
	HCG	cm.	79.802	4.752	82.428	4.439	-2.023	0.043*
	WR	n.m.	89.053	12.203	86.813	11.781	-0.405	0.686
	WL	n.m.	105.150	30.786	103.555	23.293	-0.405	0.686
	WCG	n.m.	244.679	103.105	276.310	109.596	-1.753	0.080
Performance	Clean & Jerk	Kg.	97.000	14.036	100.200	14.096	-2.121	0.034*

Table 3. Shows the results of significant statistical differences to Wilcoxon test the control group between pre and post measurements in tests of muscular balance, dynamic parameters and the level of achievement for clean and jerk skill. Where the value of P <0.05 in all variables search which shows statistically significant differences between pre and post measurement for post measurement.

Table 4. Statistics-test for the Muscular balance and dynamic parameters of Mann-Whitney between Experimental and Control group to post-test.

Variables			Experimental group		Control group		z	p.
			Average	SD.	Average	SD.		
Muscular balance	Right grip	Kg.	40.600	2.408	35.400	2.302	-2.305	0.021*
	Left grip	Kg.	39.600	1.816	34.600	2.074	-2.417	0.016*
	Clean pull	Kg.	189.000	56.613	116.800	28.969	-1.991	0.047*

	Jerk push	Kg.	79.000	15.166	59.800	8.843	-2.009	0.045*
	Good Morning	Kg.	106.000	27.019	76.600	15.060	-1.984	0.047*
	Snatch balance	Kg.	147.000	28.636	111.000	12.942	-2.015	0.044*
Pull phase 11.	T	Sec.	0.656	0.062	0.764	0.064	-2.095	0.036*
	HR	cm.	85.374	2.287	76.174	3.674	-2.611	0.009*
	HL	cm.	87.606	2.292	77.944	3.409	-2.611	0.009*
	HCG	cm.	87.412	1.527	77.612	3.476	-2.611	0.009*
	WR	n.m.	410.264	95.167	262.839	34.933	-2.402	0.016*
	WL	n.m.	433.561	102.709	272.296	40.947	-2.402	0.016*
	WCG	n.m.	940.043	178.845	689.743	104.515	-2.193	0.028*
Squat	T	Sec.	0.760	0.075	0.668	0.069	-1.687	0.092
	HR	cm.	66.618	3.212	57.134	4.744	-2.611	0.009*
	HL	cm.	67.606	2.573	64.784	3.240	-1.776	0.076
	HCG	cm.	33.406	5.539	24.806	5.095	-1.984	0.047*
	WR	n.m.	124.887	18.187	92.258	19.549	-2.193	0.028*
	WL	n.m.	132.794	16.360	77.816	15.692	-2.611	0.009*
	WCG	n.m.	1082.566	124.243	874.992	86.857	-2.193	0.028*
Standing up clean	T	Sec.	1.008	0.168	1.244	0.078	-2.305	0.021*
	HR	cm.	134.574	1.006	135.044	2.286	-2.193	0.028*
	HL	cm.	134.666	0.830	134.320	1.251	-2.193	0.028*
	HCG	cm.	83.034	1.604	77.408	4.674	-1.776	0.076
	WR	n.m.	457.196	75.393	382.051	53.134	-2.402	0.016*
	WL	n.m.	451.412	75.069	354.389	48.295	-2.402	0.016*
	WCG	n.m.	995.063	109.214	879.612	141.924	-1.776	0.076
Jerk	T	Sec.	0.944	0.096	1.136	0.083	-2.371	0.018*
	HR	cm.	172.088	3.216	164.088	5.581	-0.104	0.917
	HL	cm.	171.038	3.986	162.638	4.750	-0.313	0.754
	HCG	cm.	69.768	2.332	66.568	2.124	-1.984	0.047*
	WR	n.m.	256.628	67.509	144.481	37.546	-1.567	0.117
	WL	n.m.	248.596	65.591	139.506	37.048	-1.776	0.076
	WCG	n.m.	272.723	101.595	188.124	111.835	-1.776	0.076
Standing up jerk	T	Sec.	1.040	0.228	1.076	0.239	-0.745	0.456
	HR	cm.	192.810	3.282	182.010	3.153	-2.611	0.009*
	HL	cm.	192.966	3.377	183.566	4.479	-2.402	0.016*
	HCG	cm.	84.028	3.487	82.428	4.439	-0.731	0.465
	WR	n.m.	139.458	23.765	86.813	11.781	-2.611	0.009*
	WL	n.m.	147.260	24.564	103.555	23.293	-2.193	0.028*
	WCG	n.m.	300.799	150.663	276.310	109.596	-0.313	0.754
Performance	Clean & Jerk	Kg.	138.000	26.589	100.200	14.096	-2.095	0.036*

Table 4. Significant statistical differences of Mann-Whitney test in the post measurement of muscular balance, dynamic measurements and the level of achievement for clean and jerk skill between the control and experimental groups. Where the value of P <0.05 in all research variables indicating that there are statistically significant differences between the control and the experimental group for the experimental group.

Discussion

The results of this study showed that there are statistically significant differences at the level of 0.50, where the value of P < 0.05 in tests of muscular strength and maximum some dynamic parameters of study and the level of achievement of the clean and jerk skill between two measurements pre- and post-test control group and in favor of post measure, researchers find the improvement of the control group mainly due to attend the training and the application of the program, which includes exercises to help applied to the control group. This is consistent with the results of studies (Ebada, 2008, Ebada, 2011), which indicated the superiority of measuring post measurement control group in tests of muscle strength and maximum power explosive and the level of achievement of the clean and jerk skill due to the effect of exercise help to improve the level of achievement of the clean and jerk skill.

The results also showed that there are statistically significant differences at the 0.05 level, where the value of P < 0.05 in muscular balance tests and dynamic parameters and the level of achievement for clean and jerk skill between pre and post measurements of the experimental group in favor of the post measurement. The researchers attributed this progress to the impact of the training program for muscular balance applied to the experimental group.

Where results showed low time motor performance in measuring post-test with increased mechanical work on both sides of the bar left and right and center of gravity body mass during the stages of various performance is an indicator of increased mechanical power for the weightlifters, as the ability = work / time, the researchers due to the impact of the training program, which includes maximum strength training of balanced muscular groups and working in the motor performance of the skill that led to increased muscular strength and balance of the weightlifters and then increase to the level of achievement (Hall, 2005, Andras, 2011), that with the increase of mechanical work and decrease time mechanical power is increased, as noted increased time performance stage squat in measuring post-test for measurement pre- test where the value of P < 0.05, an indicator of the strength of the player and the ability to control raised weight during descent to put squat The researcher due that to the program, which includes the training muscular balance which contributed to the harmonious development of muscular strength of weightlifter.

The results also showed the experimental group are statistically significant differences where the value of P < 0.05 in the height sides of the bar right and left the ground in measuring post-test for pre-test, as well as the approaching averages rise the left and right sides of the bar, an indicator of the balance of motor performance of the players as well as to improve the potential energy stored body and gained player as a result placed by the player's ability to stretch the muscles, which evolved after the training program, and with the increase of weight raised led to the improvement of potential energy (Hall, 2005, Ibrahim, 2006, Whiting, Zernicke, 2008), potential energy = (m* g*h), where m = mass, g = gravitational acceleration ,h = height in meters above the reference which is what has been achieved in the post test measurement of an increase in the height of both sides of the bar as well as raised weight, which led to increased potential energy of squat.

The results showed that there statistically significant differences between the post measurements between experimental and control groups and in favor of the experimental group as the value of P < 0.05 in tests muscular balance parameters dynamic stages performance to stage clean and jerk in increasing mechanical work effort on both sides of the bar left and right and center of gravity body mass during performance stages (Pull phase 11., squat, Standing up clean, Standing up clean, Jerk, Standing up jerk), an indicator of increasing the mechanical power of weightlifting player, which leads to improvement in the level of achievement for clean and jerk skill (Whiting, Zernicke, 2008) and that is due to the training program for muscular balance applied on the experimental group. If the common center of gravity will be lifted vertically we can minimize the energy requirement for the lift, and minimize also the negative effect on the performance of the lifter. So weightlifter will produce a better result. Plus another advantage: having an optimum technique from dynamic parameters, as point of view, the risk of injury is also much less. This fact is because of the good balanced lift, minimizing the unnecessary load on the joints of the body of weightlifters (Andras, 2011).

Compatibility between muscle groups holding and extensor help increase muscular strength in performance, and that by keeping in true balance with a maximal strength increase, is the first, requirement for the development of muscular strength (David, John, 1997).

To overcome the imbalance muscles resulting from adaptation to performance, it requires some measures to attempt the power equation for this weak side until growth is moderate, and this requires strengthening the muscles interview and this requires strengthen muscles corresponding through exercises affected a direct impact on the strength not only major muscle force during perform clean and jerk skill, but also the corresponding muscles (Frank, et. al., 2012). Muscle balance requires an equivalence between the power of the muscle or group of muscles working in the skill with ability muscle or group muscles corresponding, and requires a balance in the percentage strength in the body of individual and that on both sides of the body and between the parties the upper and lower body and between muscle groups on the same joint, and requires access to this balance training to perform repetitions and appropriate used muscle groups the basic dynamics of movement and muscle anti muscle help (Cochran, House, 2000).

Conclusion

There are statistically significant differences between the experimental and control groups in muscular balance and dynamic performance parameters Clean and jerk skill. The effectiveness of the training program to increase muscular balance, improved dynamic performance and the level of achievement of the weightlifters.

These results must be taken into account by the coaches and weightlifters for the development of muscular balance for improved dynamic performance and the level of achievement for Clean and jerk skill.

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Appendix 1. The training program to the development of the muscular balance for Experimental group for Clean and jerk skill for weightlifters.

weeks	Day	Exercises	intensity	Repetition	sets	Rest between exercises	Terminal rest
Week 1	Sunday	Front Squat, Back Squat, Power Clean, clean From Knee, Clean and jerk	80%	3	2	10sec.	1min
	Tuesday	Power jerk, clean from blocks, Back Squat, Clean and jerk, Hang clean	85%	3	2	10sec.	1min
	Thursday	Snatch Balance, high pull of clean, Front Squat, Clean Pull, Clean and jerk	80%	3	2	10sec.	1min

		Warm-up : Exercises in unit intensity 40% -3 repetitions- 2 groups from Maximum weight player (1) time lift					
Week 2	Sunday	Power Clean, dead pull of clean, split jerk, Clean and jerk, half squats	85%	2	3	10sec.	1min
	Tuesday	Push press, Good morning, Back Squat, Power jerk, Clean and jerk	85%	2	3	10sec.	1min
	Thursday	Clean pull Snatch Pull, Bench press, Split jerk, Clean and jerk	85%	2	3	10sec.	1min
		Warm-up : Exercises in unit intensity 45% 6repetitions 1groups from Maximum weight player(1)time lift					
Week 3	Sunday	Barbell squats, Power Clean Back Squat, leg press, Clean and jerk	90%	1	4	10sec.	1min
	Tuesday	Clean Pull, dumbbell barbell lunges, Back Squat, Hang Power Clean pull, Clean and jerk	85%	2	4	10sec.	1min
	Thursday	Power hang clean, Power jerk, Half squats, Clean Pull, Clean and jerk	90%	1	4	10sec.	1min
		Warm-up : Exercises in unit intensity 50% - 4 repetitions- 1 groups from Maximum weight player (1) time lift					
Week 4	Sunday	Power Snatch, Snatch Pull, Snatch, Power jerk, Clean and jerk	85%	2	3	10sec.	2min
	Tuesday	Power clean, Clean Pull, Power jerk, Split jerk, Clean and jerk,	85%	2	3	10sec.	2min
	Thursday	Power clean, Hang clean, Front Squat, Clean Pull, Clean and jerk	85%	2	3	10sec.	2min
		Warm-up : Exercises in unit intensity 40% - 5 repetitions- 2 groups from Maximum weight player (1) time lift					
Week 5	Sunday	Front Squat, Back Squat, Power Clean, clean From Knee, Clean and jerk	90%	1	5	10sec.	1min
	Tuesday	Power jerk, clean from blocks, Back Squat, Clean and jerk, Hang clean	90%	1	5	10sec.	1min
	Thursday	Snatch Balance, high pull of clean, Front Squat, Clean Pull, Clean and jerk	90%	1	5	10sec.	1min
		Warm-up : Exercises in unit intensity 45% - 5 repetitions- 1 groups from Maximum weight player (1) time lift					
Week 6	Sunday	Power Clean, dead pull of clean, split jerk, Clean and jerk, half squats	83%	3	3	10sec.	2min
	Tuesday	Push press, Good morning, Back Squat, Power jerk, Clean and jerk	85%	3	3	10sec.	2min
	Thursday	Clean pull Snatch Pull, Bench press, Split jerk, Clean and jerk	83%	3	3	10sec.	2min
		Warm-up : Exercises in unit intensity 50% - 2 repetitions- 2 groups from Maximum weight player (1) time lift					
Week 7	Sunday	Barbell squats, Power Clean Back Squat, leg press, Clean and jerk	85%	2	4	10sec.	2min
	Tuesday	Clean Pull, dumbbell barbell lunges, Back Squat, Hang Power Clean pull, Clean and jerk	90%	1	5	10sec.	2min
	Thursday	Power hang clean, Power jerk, Half squats, Clean Pull, Clean and jerk	85%	2	4	10sec.	2min

		Warm-up : Exercises in unit intensity 45% - 5 repetitions- 1 groups from (1) time lift				Maximum weight player	
Week 8	Sunday	Power Clean, dead pull of clean, split jerk, Clean and jerk, half squats	85%	2	4	10sec.	2min
	Tuesday	Push press, Good morning, Back Squat, Power jerk, Clean and jerk	90%	1	5	10sec.	2min
	Thursday	Clean pull Snatch Pull, Bench press, Split jerk, Clean and jerk	85%	2	4	10sec.	2min
		Warm-up : Exercises in unit intensity 50% - 3 repetitions- 2 groups from (1) time lift				Maximum weight player	
Week 9	Sunday	Barbell squats, Power Clean Back Squat, leg press, Clean and jerk	85%	3	4	10sec.	2min
	Tuesday	Clean Pull, dumbbell barbell lunges, Back Squat, Hang Power Clean pull, Clean and jerk	90%	1	7	10sec.	2min
	Thursday	Power hang clean, Power jerk, Half squats, Clean Pull, Clean and jerk	85%	3	4	10sec.	2min
		Warm-up : Exercises in unit intensity 40% -5 repetitions- 2 groups from (1) time lift				Maximum weight player	
Week 10	Sunday	Front Squat, Back Squat, Power Clean, clean From Knee, Clean and jerk	85%	2	4	10sec.	2min
	Tuesday	Power jerk, clean from blocks, Back Squat, Clean and jerk, Hang clean	90%	1	5	10sec.	2min
	Thursday	Snatch Balance, high pull of clean, Front Squat, Clean Pull, Clean and jerk	85%	2	4	10sec.	2min
		Warm-up : Exercises in unit intensity 45% - 5 repetitions- 1 groups from (1) time lift				Maximum weight player	
Week 11	Sunday	Power Clean, dead pull of clean, split jerk, Clean and jerk, half squats	85%	2	4	10sec.	2min
	Tuesday	Push press, Good morning, Back Squat, Power jerk, Clean and jerk	100%	1	6	10sec.	2min
	Thursday	Clean pull Snatch Pull, Bench press, Split jerk, Clean and jerk	90%	1	7	10sec.	2min
		Warm-up : Exercises in unit intensity 50% - 3 repetitions- 2 groups from (1) time lift				Maximum weight player	
Week 12	Sunday	Power jerk, clean from blocks, Back Squat, Clean and jerk, Hang clean	90%	2	4	10sec.	2min
	Tuesday	Front Squat, Back Squat, Power Clean, high pull of clean, Clean and jerk	100%	1	6	10sec.	2min
	Thursday	Barbell squats, Power Clean Back Squat, leg press, Clean and jerk	90%	2	4	10sec.	2min
		Warm-up : Exercises in unit intensity 45% - 4 repetitions- 1 groups from (1) time lift				Maximum weight player	

cf.(Ebada, 2011, Ajan, 2006)

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INVESTIGATION OF FEARS OF NEGATIVE EVALUATION OF YOUNG NATIONAL KICK BOXERS IN TERMS OF SOME VARIABLES

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Abstract

*Purpose.*This research was a survey model that aimed at investigating fear of negative evaluation of young national kick-boxers in terms of some variables.
*Methods.*The study was conducted with 41 kick-boxers (23 female kick-boxers and 18 male kick-boxers) who were selected out of 48 kick-boxers of Turkish National Young Kick-boxing Team using random sampling method and who were preparing at Niğde Demirkazık Sportive Camping Center between the 27th of August and the 8th of September, 2012 for the World Young Kick-boxing Championship to be held in Slovakia-Bratislava between the 8th and the 15th of September. Participation was voluntary. The mean age was 17.2 ±.04 and mean sports-age was 5.40 ± 2.70. In the study; Fear of Negative Evaluation Scale which was developed by Leary (1983) and Turkish adaptation of which was performed by Çetin et al. (2010) was used. It is a five-point Likert type scale with 11 items. Internal consistency coefficient was .84. Reliability coefficient obtained by split-half was .83. The scale was administered to 76 subjects after a two-week interval using test-retest method in order to determine the reliability of the scale. After the administration of the scale, test-retest reliability coefficient of the scale was found to be .82. For the statistical analysis of the data, such descriptive methods as frequency (n) and percentages (%) were used for the personal descriptive data. In order to detect the differences; non-parametric test -Mann-Whitney U test- was employed because the data did not follow a normal distribution in the variables and homogeneity conditions were not obtained. Level of significance was set at 0.05. *As the result* of the study; it was seen that level of fear of negative evaluation of young national kick-boxers was not statistically different in terms of gender variable.
*Conclusions.*On the other hand; full contact kick-boxing and having a close/emotional friend from opposite sex affected their level of fear of negative evaluation negatively.
Key Words: Fear of Negative Evaluation, Social Anxiety, National Kick-boxer/

Introduction

Human beings are by their nature social creatures and live and die in a web of relations. These relations range from parents, friends, neighbors and colleagues and may be different in many ways (Hortaçsu, 2003). As long as a healthy relation with others is established, human beings can continue their life. Communication is one of the absolute facts for all people (Ergin and Birol, 2005). However; developing social relations, expression oneself –in short communicating- may pose a problem due to various reasons.

There are too many people who cannot express themselves, cannot talk in front of others, experience anxiety in community -that is, experiencing 'social anxiety' (Kağıtçıbaşı, 1988). Social anxiety is described as a constant fear for a situation in which others evaluate the individual; as a feeling of discomfort for being embarrassed, shame or being fooled due to his behaviors. Those who undergo social anxiety are over-sensitive to others' evaluations, negative opinions and tend to do everything to avoid these evaluations and opinions (Dilbaz, 1997). Social fear is a significant behavior disorder that prevents individual from many social settings, decrease his quality of life and isolates him from forming interpersonal relations.

Social anxiety is a common problem in the general population and many people experience anxiety in different social situations to some degree (Sanders, 2003). In the study of Bayramkaya, Toros and Özge (2005) on Turkish adolescents, it was seen that prevalence of social anxiety was 14.4%. social anxiety

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increases more and more among those who have poor social supports, lower educational status, receive psychiatric treatments and are female (Walsh, 2005). Social anxiety is described in Diagnostic and Statistical Manual of Mental Disorders as an intense, irrational and persistent fear of being scrutinized or negatively evaluated by others when the person is exposed to unfamiliar people or to possible scrutiny by others and the individual fears that he or she will act in a way (or show anxiety symptoms) that will be humiliating or embarrassing (Apa, DSM-IV, 2001). The difference between social anxiety and social anxiety disorder is the degree of the emotional problems experienced by the people. People with social anxiety disorder experience the problem more severely and more intensely (Cited: Hamatra, 2009)

Although the findings related to the age of the social phobia differed in the studies, Tillman et al. (2003) examined many behavioral disorders of social phobia among the children aged 7-16 and found out that the onset age of the social phobia was 7.3. There are also other studies that suggest that social phobia start during childhood. For example; the study of Boyd et al. (1990) on the frequency and onset-age of phobia reported that frequency of social phobia increased between the ages of 11 and 17. At the age of 20s, frequency of social phobia decreases and almost disappears during the following years (Cited by Demir, 2009).

It may be argued that communication with others has an impact upon one's psychological health (Demir and Kaya, 2008). Particularly; during the transition to adulthood -adolescent period- (Nurmi, 2004), relations of the adolescents with their peers play a key role in their social identity and social behavior development (La Greca and Lopez, 1998; Nurmi, 2004). When the developmental tasks to be done by the adolescents are considered, adolescent period poses the highest risk for social anxiety (Albano and Hayward, 2004).

As a result, many authors agree that social anxiety appears during adolescent period. Peer acceptance becomes very important during adolescent period and it is known how important that period is in terms of others' influences on us.

Sports has been increasing its influence on people both as an active participator and as a passive participator and has been growing and developing day by day. Together with this increased interest in sports; a significant rivalry atmosphere has been created and countries have been doing their best to use positive contributions of sports (Gümüş, 2002).

Today; there are many factors that affect sportive productivity. Some of these factors are called environmental factors while others as internal factors. One of the internal factors of the athletes is psychological factors. Psychological preparation of athletes is a crucial factor in sportive success. Psychological status and their performance are closely related with their anxiety levels (Karabulut et al. 2013.)

Anxiety is universal and may affect the performance positively or negatively among all of the players. Anxiety may lead to deterioration in behaviors and abilities of the players by causing wrong decisions. Over-anxiety levels may force the players to make unrealistic decisions. It is seen that athletes often make wrong decisions when they are under excessive anxiety and pressure conditions (Tavacıoğlu, 1999). Athletes who cannot get sportive achievement in the trainings and competitions or show low performance, too, may feel anxious about how they are evaluated. Stressful and anxiety states, occur for most athletes especially before and during competition, given the social, professional and emotional "stake" involved in achieving good results (İoana et al., 2012). In the studies, it was seen that high expectations, fear of error and failure, importance of competition, excessive importance attributed to the result and fear of negative evaluation are reported as the triggers of sportive anxiety (Sevimli, 2009).

When the literature is analyzed, it is noted that the number of the relevant studies is small. We are of the opinion that determination of the affecting-factors of fear of negative evaluation will be helpful in taking the necessary precautions so that the players can be more successful.

Material and Method

This research was a survey model that aimed at investigating fear of negative evaluation of young national kick-boxers in terms of some variables. The study was conducted with 41 kick-boxers (23 female kick-boxers and 18 male kick-boxers) who were selected out of 48 kick-boxers of Turkish Young Kick-boxing Team using random sampling method and who were preparing at Niğde Demirkazık Sportive Camping Center between the 27th of August and the 8th of September, 2012 for the World Young Kick-boxing Championship to be held in Slovakia-Bratislava between the 8th and the 15th of September. Participation was voluntary. The mean age was 17.2 ±.04 and mean sports-age was 5.40 ± 2.70.

In the study; Fear of Negative Evaluation Scale which was developed by Leary (1983) and Turkish adaptation of which was performed by Çetin et al. (2010) was used. It is a self-report scale to measure one's tolerance about negative or hostile evaluation by others. It is a five-point Likert type scale with 11 items. Internal consistency coefficient was .84. Reliability coefficient obtained by split-half was .83. The scale was administered to 76 subjects after a two-week interval using test-retest method in order to determine the reliability of the scale. After the administration of the scale, test-retest reliability coefficient of the scale was found to be .82.

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For the statistical analysis of the data, such descriptive methods as frequency (n) and percentages (%) were used for the personal descriptive data. In order to detect the differences; non-parametric test -Mann-Whitney U test- was employed because the data did not follow a normal distribution in the variables and homogeneity conditions were not obtained. Level of significance was set at 0.05.

Table 1. Demographic Data About The Study-Group

Variables	*Subcategory*	*N*	*%*
Gender	Female	23	56.1
	Male	18	43.9
	Total	**41**	**100**
Branch of Kick-boxing	Full-Contact	25	61.0
	Semi-Contact	16	39.0
	Total	**41**	**100**
Having a close/emotional girl or boy friend	Yes	13	31.7
	No	28	68.3
	Total	**41**	**100**

As seen in Table 1, 56.1% of the study group were female and 43.9% were male. Kick-boxers of full-contact composed 61% of the study group while kick-boxers of semi-contact composed 39% of the study group. 31.7% of the study group told that they had a close/emotional girl or boy friend while 68.3% told that they did not.

Findings

Table 2. Results Of Mann-Whitney-U Test Performed To Detect The Level Of Fear Of Negative Evaluation In Terms Of Gender

	Gender	**N**	**Median**	**Median Total**	**U**	**p**
Fear of negative evaluation	Female	23	22.41	515.5	174.5	.392
	Male	18	19.19	345.5		
	Total	**41**				

As understood in the data presented in Table 2, there was no significant difference between kick-boxers' mean scores of Fear of Negative Evaluation Scale and "gender" variable (p>.05). However; when the Table was analyzed, it was seen that mean scores of Fear of negative evaluation of female kick-boxers (X= 22.41) were higher than the mean scores of male kick-boxers (X=19.19).

Table 3. Results Of Mann-Whitney-U Test Performed To Detect The Level Of Fear Of Negative Evaluation In Terms Of Branch Of Kick-Boxing

	Branch of Kick-boxing	**N**	**Median**	**Median Total**	**U**	**p**
Fear of negative evaluation	Full-Contact	25	24.24	606	119	.030*
	Semi-Contact	16	15.94	255		
	Total	**41**				

According to the data presented in Table 3, there was a significant difference between kick-boxers' mean scores of Fear of Negative Evaluation Scale and "branch of kick-boxing" variable (p<.05). It was seen that mean scores of kick-boxers doing full-contact (X=24.24) were higher than those doing semi-contact (X= 15.94).

Table 4. Results Of Mann-Whitney-U Test Performed To Detect The Level Of Fear Of Negative Evaluation In Terms Of Having A Close/Emotional Friend From Opposite Sex

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	Having a close/emotional girl or boy friend	N	Median	Median Total	U	p
Fear of negative evaluation	Yes	13	27.77	361	94	.013*
	No	28	17.86	500		
	Total	**41**				

As seen in the data presented in Table 4, there was a significant difference between kick-boxers' mean scores of Fear of Negative Evaluation Scale and "having a close/emotional friend from opposite sex" variable (p<.05). Means scores of the kick-boxers who had a close/emotional girl or boy friend (X=27.77) were higher than those who did not (X= 17.86).

Discussion

In the study which aimed at investigating fear of negative evaluation of kick-boxers in terms of different variables; no statistically significant difference was found between kick-boxers' mean scores of Fear of Negative Evaluation Scale and "gender" variable (p>.05). However, when mean scores were analyzed, it was seen that female kick-boxers had higher scores from both of the scales. In a study conducted (West and Newman, 2007), it was pointed out that girls experienced higher social phobia because their parents and the society prevent their actions before and during adolescence. In light of this result; girls in our society are expected to show calm and modest behaviors and not to go too far in their behaviors whereas boys are expected to be more assertive, interrogative and aggressive behaviors. Additionally, it may be suggested that girls' having more sensitive and fragile personality -especially- during adolescence period may have affected the study findings. In the studies of Leary and Kowalski (1995), Köydemir and Demir (2007), Sevimli (2009) Polat et al. (2010) similar results were obtained. These findings were in agreement with our findings.

Another finding of the study was that mean scores of kick-boxers who participated in the championship in full-contact branch were higher than those who participated in the championship in semi-contact. Full-contact is a discipline in which the competitor intends to win the opponent with all of his energy and strength. The competitor should hit fast and strongly to the parts of the body allowed with kicks and punches. As for semi-contact, the aim is to win the highest score by using the regular techniques and speed and what matters is not efficiency but technique and speed (Kick-Boks gov.tr). In literature; there was no such a study on kick-boxers. Arslan ve ark. (2009), in a study conducted on muai-Thai athletes, the athletes of the factors affecting the level of anxiety and fear and the sense of competition refers to the importance of competition.

It may be concluded that this result may have been resulted from the possibility that full-contact boxers have more anxiety due to the fact that full-contact requires more struggling, is a more severe branch, more importance is paid to the success in full-contact and there are more trainers in full-contact than semi-contact.

It was discovered in the study that kick-boxers who had a close/emotional girl or boy friend experienced bigger negative evaluation fear. People who experience social anxiety have big difficulty in making social interactions. In order to form, to continue and to get satisfaction with positive interpersonal relations; people need to point out their emotions, opinions and wishes (Subaşı, 2007). Therefore; the fact that those who had a close/emotional girl or boy friend experienced bigger negative evaluation fear may have resulted from the possibility that the research group was composed of adolescents, they had emotional relations at an early age and ideas and opinions of the close/emotional girl or boy friend was valued a lot among this age group. And also; errors committed during the competitions in front of the close/emotional girl or boy friend may cause a humiliation and embarrassment among the adolescent kick-boxers.

Result

In the study, it was seen that gender variable did not have any effect upon the fear of negative evaluation of young national kick-boxer. On the other hand; another result of the study was that full contact kick-boxing affected the level of fear of negative evaluation negatively. Also; having a close/emotional friend from opposite sex affected the level of fear of negative evaluation negatively

The following recommendation can be put forward in light of the findings obtained in the study:

Families should be instructed by the specialists about the importance of child-raising.

Proper settings should be established so that children can be socialized.

Conclusions.During the selection of athletes; trainers and physical education teachers should select those who can minimize anxiety levels under every condition

Trainers should closely watch significant others of the athletes and should show attitudes that eliminate their anxiety.Trainers should be educated by professionals about how to eliminate anxiety and the athletes should be educated about the coping anxiety methods

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EFFECT OF THE BALL ON QUICKNESS AND ACCELERATION PERFORMANCE IN YOUNG SOCCER PLAYERS

ERKMEN NURTEKIN[1], TASKIN HALIL[1], ALPER TUNGA PEKER[2]

Abstract
The aim of the research. The purposes of this study was to examine the effect of ball on quickness and acceleration performance in young soccer players.
*Methods of research***.** A total of 16 soccer players were examined. These soccer players were playing in first leagues of Turkey. The mean (SD) age was 18,19±0,75 years, height was1,82±6,63 m, and weight was 73,5±6,07 kg for the 16 soccer players. While the tests were conducted, the same weather conditions were taken into consideration. This was followed by the administration of 5-m quickness, 5-m quickness with ball, 10-m acceleration, and acceleration with ball tests. Each test was applied twice, with a 3-minute interval, and the best result was recorded. There was a 5-minute rest session between the two tests. Soccer balls, cone, photocell, and tape measure for distance were used. The methodology employed during the tests is summarized in the following paragraphs.
*Main results***.** A significant relationship no existed between quickness and quickness wit ball ($P>0.05$). On the other hand, a significant relationship existed between acceleration and acceleration wit ball ($P<0.05$). A unit increase in acceleration with ball lead to a change in the rate of 51% in acceleration performance.
*In conclusion***;** our study showed that quickness is very important for soccer game. All soccer players need to moves quickly with ball and without ball. Also, to minimize change of speed, coaches should imporove acceleration wit ball in training. Their training should involve in multiple planes at varied speeds.
Key words: Football, quickness, change of speed, young.

Introduction

Soccer is one of the most widely played sports in the world and is a sport characterized by short sprints, rapid acceleration or deceleration, turning, jumping, kicking, and tackling (Arnason et al. 2004; Bangsbo and Michalsik 2002; Harris and Reilly 1998; Wisloff et al. 1998). Elite soccer is a complex sport, and performance depends on a number of factors, such as physical fitness, psychological factors, player technique, and team tactics (Rösch et al. 2000). Linear actions such as acceleration and top end speed can be affected by changing the mechanics of the arms or legs (Brown and Vescovi 2003). The mechanisms behind the link between agility, acceleration and quickness for starting performance are probably multifactorial (Ørtenblad et al. 2000; Ross and Leveritt 2001). Acceleration is the rate of change in velocity that allows a player to reach maximum velocity in a minimum amount of time (Little and Williams 2005). Accelerating from a stationary position or a moving start requires high force generation capacity to overcome the body's inertia. Delecluse (1997) found maximal speed and acceleration to be specific qualities in sprint athletes. Acceleration is defined as the rate of change in velocity and is often measured by assessing sprint performance over short distances, such as 5 or 10 yards (Murphy et al. 2003). Quickness is the ability to read and react to a situation (Moreno 1995). Quickness is considered both a multidirectional skill that combines explosiveness, reactiveness, and acceleration and agility while incorporating flexibility, strength, and neuromuscular coordination by allowing the athlete to move at a higher rate of speed (Brown and et al. 2000). The importance of that kind of muscle action can be seen when deceleration or acceleration actions are performed during a game (Jovanovic et al. 2011). Furthermore, elite players are mostly characterized by reaction ability in the distances ranging from 5 to 10 m (Sporis et al. 1953). We can find no published literature on quickness and acceleration which is effected by the ball. Acceleration and quicknes are important components of sport performance. Therefore, the purposes of this study were to examine effect of the ball on quickness and acceleration performance in soccer players.

Material and methods

A total of 16 soccer players were examined. These soccer players were playing in first leagues of Turkey. The mean (SD) age was 18,19±0,75 years, height was1,82±6,63 m, and weight was 73,5±6,07 kg for the 16 soccer players. Before conducting the experiment, all subjects were informed of the risks of the study and gave informed consent. The study was

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approved by an ethics board and met the conditions of the Helsinki Declaration. All of the soccer players included the study had the same physical fitness because they attended the preparatory period, which had lasted 6 weeks. The tests were applied the second week of december in the contest season, and the aims of all tests were explained to the players before the tests were conducted. The tests were started with a 20-minute warm-up session. While the tests were conducted, the same weather conditions were taken into consideration. This was followed by the administration of 5-m quickness, 5-m quickness with ball, 10-m acceleretion, and acceleration with ball tests. Each test was applied twice, with a 3-minute interval, and the best result was recorded. There was a 5-minute rest session between the two tests. Soccer balls, cone, photocell, and tape measure for distance were used. The methodology employed during the tests is summarized in the following paragraphs.

Quickness and acceleration without ball tests

Photocells were placed at the start, 5 m (quickness) and 10 m (acceleration) in order to collect sprint times over the 2 distances. The starting position was standardized for all subjects. Soccer players started in a 2- point crouched position with the left toe approximately 30 cm back from the starting line and the right toe approximately in line with the heel of the left foot. Soccer players wore rubber-soled track shoes. Therefore, Quicness was evaluated for 5-m. Acceleration was evaluated using a 10-m test. Test was applied twice, with a 3-minute interval, and the best result was recorded for statistical analysis.

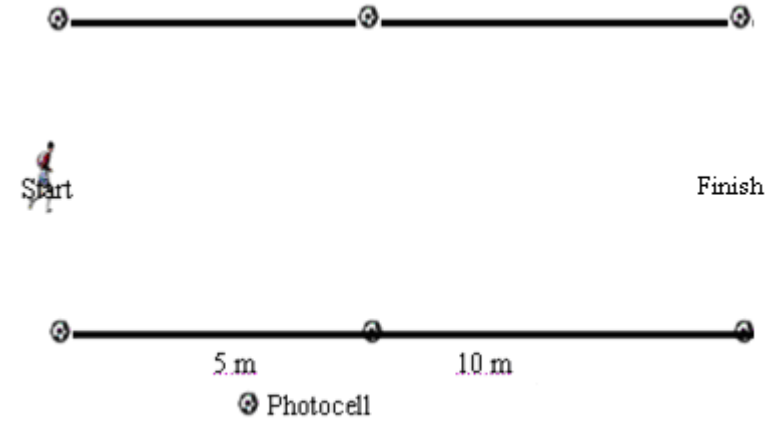

Figure 1. quickness test for 5 m, acceleration test for 10 m without ball

Quickness and acceleration with ball tests

Photocells were placed at the start, 5 m (quickness with ball) and 10 m (acceleration with ball) in order to collect sprint times over the 2 distances. The starting position was standardized for all soccer players. Soccer players started in a 2- point crouched position with the left toe approximately 30 cm back from the starting line and the right toe approximately in line with the heel of the left foot and with ball. Soccer players wore rubber-soled track shoes. Therefore, Quicness with ball was evaluated for 5-m. Acceleration with ball was evaluated using a 10-m test. Test was applied twice, with a 3-minute interval, and the best result was recorded for statistical analysis.

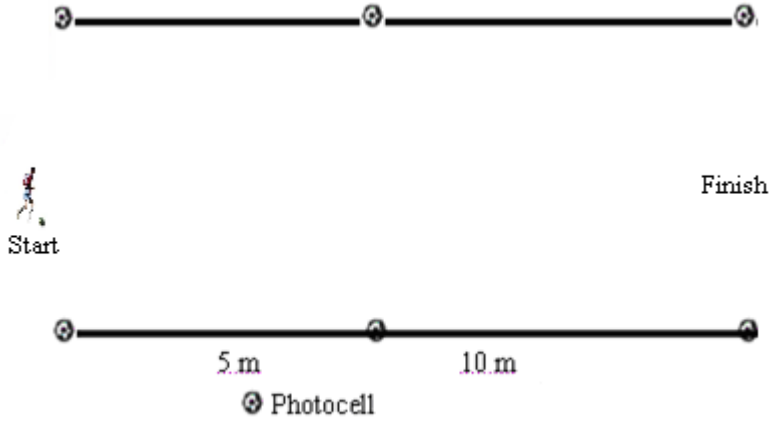

Figure 2. quickness test for 5 m, acceleration test for 10 m with ball

Statistical Analysis

SPSS 16.0 statistical program was used for evaluation and calculation of the data. The data was summarized and evaluated by the means and standard deviations. To explain relationship between measurements, Pearson Correlation analysis was used according to the results of the test of normality, and linear regression analysis was used to predictive power of explanation on quickness and acceleration of ball. The significance level was taken as 0.05.

Results

Table 1. Data summary for soccer players.

Variables	Mean (sec)	Std. deviation
Age (yıl)	18,19	0,75
High (m)	1,82	6,63
Weight (kg)	73,5	6,07

The mean (SD) age was 18,19±0,75 years, high was 1,82±6,63 m, and weight was 73,5±6,07 kg for the 16 soccer players.

Table 2. Data summary for soccer players in performance.

Variables	Mean (sec)	Std. Deviation
Quickness	1,04	0,11
Quickness with ball	1,08	0,07
Acceleration	1,69	0,11
Acceleration with ball	1,93	0,13

The mean (SD) quickness was 1,04±0,11 seconds, quickness with ball was 1,08±0,07 seconds, acceleration was 1,69±0,11 seconds, and acceleration with ball was 1,93±0,13 seconds for the 16 soccer players.

Table 3. Analaysis of regression between quickness, acceleration and ball

Dependent variables	**Variables**	**B**	**Standart hata**	**Beta**	**T**	**P**
Quickness	Ball	0,407	0,408	0,257	0,995	0,336
	R = 0,257	R^2 = 0,066	F = 0,991 P = 0,336			
Acceleration		0,513	0,185	0,594	2,764	0,015
	R = 0,594	R^2 = 0,353	F = 7,640 P = 0,015			

As shown Table 1, the model is not found to be meaningfull in the regresssion results of ball for quickness (P>0,05). A significant relationship no existed between quickness and quickness wit ball (P>0.05). On the other hand, the model is found to be meaningfull in the regresssion results of ball for acceleration (P<0,05). A significant relationship existed between acceleration and acceleration wit ball (P<0.05). A unit increase in acceleration with ball lead to a change in the rate of 51% in acceleration performance.

Discussion

The mean (SD) quickness was 1,04±0,11 seconds, quickness with ball was 1,08±0,07 seconds, acceleration was 1,69±0,11 seconds, and acceleration with ball was 1,93±0,13 seconds for the 16 soccer players. A significant relationship no existed between quickness and quickness wit ball (P>0.05). On the other hand, a significant relationship existed between acceleration and acceleration wit ball (P<0.05). A unit increase in acceleration with ball lead to a change in the rate of 51% in acceleration performance. Taskin et al. (2010) reported that did not find any statistical differences for 5-m quickness of the first output when evaluated collectively, and without the ball of soccer players (p>0.05). On the other hand, there was a statistical difference for 15-m acceleration phase when evaluated collectively, and without the ball of soccer players (p<0.05). This cross comparison collect the 15-meter acceleration phase duration times higher than without the ball was passed. Faster completion of acceleration for 10-m (3.72%) and quickness for 5-m (2.11%) indicates that the 8-week intervention was successful as regards performance enhancement when it comes to quickness and acceleration (Jovanovic et al.

2011). The facts presented are in relation with that study and the results that show the improvement in tests that estimate quickness for 5-m and acceleration for 10-m of elite soccer players (Jovanovic et al. 2011). Little and Williams (2005) found that acceleration for 10 m is 1,83±0,08 s for professional soccer players. The performances on the 10-m test for acceleration, the flying 20-m test for maximum speed, and the zigzag test for agility were all correlated at high levels of statistical significance ($p<0.0005$) (Little and Williams 2005). Research has demonstrated significant positive relationship between strength and acceleration and movement velocity (Hoff and Alamasbakk 1995).

Conclusion

Aur study showed that quickness is very important for soccer game. All soccer players need to moves quickly with ball and without ball. Also, to minimize change of speed, coaches should imporove acceleration wit ball in training. Their training should involve in multiple planes at varied speeds.

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EFFICIENCY OF LEARNING PROCESS FOR BEGINNERS IN THE GAME OF TENNIS

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Abstract
In this study we aimed to evaluate the extent to which learning basic strokes of tennis game becomes effective at the age group of 6 to 8 years, by applying specific methods and tools. Thus, in the operational approach of the study we assumed that the development and future appliance of specific algorithmic for learning basic strokes in the game of tennis will help efficiency of process training. Based on the objectives set out in the proposed experimental design we have set objectives and stages of research. Afterwards, we have established research methods and samples subjected to our study that children are starting to play tennis at age 6-8 years. In accordance with the training plan was applied the micro cycle training model, and the algorithmic systems were selected logical. Two batteries of tests (the general physical preparation and specific physical preparation) were applied in the two tests (initial, final). The results obtained showed statistically that the experimental group averages recorded results are significant at different thresholds of significance ($p < 0.025$, $p < 0.005$, $p < 0.0005$). Finally the appliance of training model in the training process led to an increase in the efficiency of learning the basic strokes in tennis at the age of 6 to 8 years.
KEY-WORDS: learning, efficiency, tennis, beginners.

Introduction

Tennis belongs to the large family of sports games, being an individual and team sport (doubles). Due to technical - tactical processes used during game by purpose in training and playing tennis is both a physical education too and sport, a sport. Movement technique is essential to ensure effective and successful in the game of tennis to develop an effective shot. Optimization of stroke biomechanics and movement is of particular importance, both in terms of performance and prevention of accidents and is as relevant for novice players as well as for professional players (Francesco, 2003).

In children younger than 10 years old who want to achieve maximum sporting potential it has to be increased the importance of learning ABC -'s (agility, balance, coordination) together with the physical skills of running, jumping, throwing and catching (Balyi and Hamilton , 2003).

In learning methodology on all three base strokes in introductory courses, it is recommended the use of practice proven methods with good results on acquiring accurate and easy basics of hitting.

In the learning process, strokes are approached in a specific sequence. Thus the recommended learning is forehand, backhand and last, serves. Having in mind that each shot consists in a number of shares of body segments in learning, these actions are addressed in a specific order (Schulz, 1993).

Dobos and Baciu, 2004 states: " Given the complex nature of strokes, the necessity of learning the correct and efficient execution of their learning process, consolidation and improvement is achieved in several stages:

- learning hitting mechanism
- strengthening and improving the game strokes in isolated conditions
- strengthening and improving the game strokes during action
- verification and themed game "

Learning striking mechanism is charged with striking movement habits, recommending exercises that are using the following sequence:

- ➢ preparatory exercises with ball and racket
- ➢ imitation exercises
- ➢ exercises on offered ball
- ➢ exercises with the ball thrown by the coach. In early learning skills the coach insists on actual stroke followed by the end of the stroke and preparation.

Initiation of the group can begin when a child may fall within a program group and the individual initiation by a foreign person can be started when child development stage does not limit the possibility of communicating with people of customary entourage (parents, grandparents) (Schulz, 1993).

R. Schulz said: "Learning the game of tennis from start with pleasure may not influence the future development. The child will gladly go to court if the early hours did not seem too difficult and noted that he

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progresses over time, and he is appreciated. "These considerations may benefit from coaching following:
Control the tennis racket, which must not be too large and too heavy.
The court is too large. To start learning phase three basic strokes played on a smaller area of court ("tennis on little court").
In young children, respectively in the first lessons and the games between beginners they use the ball of sponge (soft).
First learned basic strokes with proper technique are simple and effective (Schulz, 1993).

The basic technique of the two main strokes, right side stroke or forehand and left side stroke or backhand, is learned in the beginning on small court and by increasing the game distance continuously finally reaching the base line game. (Ene-Voiculescu, 2012)

Description of experimental design components:
Organization:

Research purposes: we watched if learning process of basic strokes in tennis game becomes effective at the age group 6-8 years by applying specific methods.
Hypothesis: it is assumed that the composition and the appliance of specific algorithmic learning basic strokes systems in the game of tennis will help the efficiency of the training process.

Objectives:
1. Study of theoretical concepts and practical experience of field specialists that are interested in strokes learning process efficiency.
2. Parameters study that highlights general physical and specific physical preparation of tennis players at this level.
3. Develop a training program for efficient learning of basic strokes during a macro cycle, for kids tennis players at this age.
4. Theoretical considerations and experimental methodologies for an efficient learning.
5. Based on the analysis and statistical processing of research and find a model for efficient training of basic strokes in the tennis game.
Research methods applied were: bibliographic study, teacher observation, experiment teaching, tests with the following batteries:
Anthropometric tests: measurement of height, weight, length, upper and lower limbs.
Tests of general physical training: running speed (30 m), long jump, high jump, tennis ball throwing.
Specific tennis game tests: cross court, long line, and maintained forehand.

Results. Experimental study approach

Statistical and mathematical method by which the following parameters were calculated: arithmetic mean, standard deviation, coefficient of variation; significance difference between the means (Student t test).
Methods. Description of tests:
Speed running distance on 30m – Specific tennis test for players at this level. Speed was measured by timing the scroll distance for each subject. Start was made from standing position on audible signal (whistle). There have been two attempts and best time was recorded.
Long jump
Was measured horizontal push power (cm) by standing long jump and we recorded best value of two trials?
Explosive power
Standing high jump with both feet; near a wall the athletes are trying to touch the wall as high as they can.
Tennis ball throwing
Throwing runs in place with one hand, carrying the only 2 attempts.
Cross court
The player behind the base line is playing the ball diagonally across the court, where a square of 1 meter is drawn, each player having 20 forehand shots.
Long line
Player is behind base line, is was forced to send the tennis ball along the line to the other side of the court, into a square of 1 meter, each player having 20 forehand shots.
Forehand maintained
The player will play forehand into the opponent's court until the first mistake.
Experimental design used in research practical design
Research subjects, the venue and stages of research:
FIRST STAGE: includes bibliographic study of all authors in the literature of the field. This phase lasted from 15th of March to 15th of June 2012.
SECOND STAGE: lasted from 20th of June to 25th of July 2012 in which we chose as research subjects the beginners kids from Laguna Sports Club, Constanta, age group 6-8 years (12 boys). Half were experimental group and half controls. We have elaborated chose and applied a series of anthropometric tests, for the general physical preparation in tennis at initial testing. Work preparation process took place in Queen Mary school gym and sports field of Samtronic Mamaia, Constanta.
Third stage: corresponded to the period 25th of July 2012 – 20th of January 2013 in which was designed and implemented the new program designed by us to increase the efficiency of training process in learning basic strokes in the game of tennis at the age 6-8 years. Also during this period, in the end there were applied again batteries of tests (final testing).
In the process of training during the experimental study we applied a specific training model for this age group (Table 1)

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TABLE nr.1 Micro cycle training model applied in the practice process

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sudnay
Am	L.D.1 20L L.S.1 4x20L	Free	L.D.2 4x20L L.D.4 4x20L L.S.3 4x20L	L.D.5 4x20L L.S.5 4x20L	Free	L.D.2 4x20L L.S.3 4x20L L.D.5 4x20L L.S.5 4x20L	L.D.1 20L L.S.1 4x20L L.D.4 4x20L L.S.2 4x20L
Pm	L.D.1 20L L.S.1 4x20L L.D.4 4x20L L.S.2 4x20L Motion games	Free	L.D.2 4x20L L.S.3 4x20L L.D.5 4x20L L.S.5 4x20L S1 4x20L Motion games	Free	L.D.4 4x20L L.S.2 4x20L S2 4x20L Motion games	Free	Free

The presented micro cycle training plan during 12 to 18 September 2012 contains the number of hours of training per day on court for tennis players aged 6-8 years. In tennis drills were introduced specific drives expressed by algorithms designed for forehand (LD), backhand (LS) and serve (S).

1. Forehand

L.D.1 – imitation forehand
L.D.2 – forehand long line and the try to hit standing cones
L.D.3 – forehand cross court and th try to hit standing cones
L.D.4 – forehand with the ball launched by coach
L.D.5 – mentained forehand until mistake
JOC – tennis game
L.V. – Various shots forehand and backhand

2. backhand

L.S.1 – imitation backhand
L.S.2 – backhand with the ball launched by coach
L.S.3 – backhand long line and the try to hit standing cones
L.S.4 – backhand cross court and the try to hit standing cones
L.S.5 – mentained backhand until mistake

3. service

S1 – sending the ball over the net into the opponent's court
S2 – sending the ball in one half of the service court.

Topics: Analysis and interpretation of data

Experimental data recorded during the study were processed, analyzed and interpreted in the final stage for the two groups of experimental and control subjects. Analysis of the results for all the parameters studied is shown in the tables that follow.

In the speed running test on 30m, for initial testing of experiment group average was 6.29 sec., and the final testing average was 6.12 sec. Mean difference between final and initial testing is 0.17 sec., and coefficient of variation for both tests is homogeneous. Calculating the significance of the average experimental group there was a significant difference $t = 4.47$ to $p < 0.0005$.

In long jump, for initial testing of experiment group average was 1.18 m and 1.23 m final, mean difference between final and initial testing is 0.05 m, and the coefficient of variability of both tests is homogeneous. Calculating significance of difference between the average experimental group there was a significant difference $t = 2.39$ to $p < 0.025$

In high jump (explosive power) for initial testing of experiment group average was 25.65 cm., and the final of 28.33 cm. Mean difference between final and initial testing is 2.68 cm., and coefficient of variation for both tests is relatively homogeneous. Calculating significance of difference between the average experimental group there was a significant difference $t = 2.1$ to $p < 0.025$, from initial testing to final testing.

For the experimental group throwing a tennis ball, initial testing average was 13.13 m and 15.56 m final, the mean difference between final and initial testing of 2.43 m, and the coefficient of variation in initial testing is homogeneous and the final is not homogeneous. Calculating the significance of the average experimental group there was a significant difference $t = 5.24$ to $p < 0.0005$.

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Table nr. 2 Analysis of the results achieved in the physical preparation of athletes parameters (experimental group) tested during the experiment (initial and final stage)

Nr. Crt.	Tested parametres	Testing		Statistical criteria C.V.%			
		Initial $\overline{X}$ ± DS	Final $\overline{X}$ ± DS	T.I.	T.F.	t	p
1	Speed running 30m (sec.)	6,29±0,52	6,12±0,49	8,04	7,82	4,47	P<0.0005
2	Long jump (cm)	1,18±0,04	1,23±0,04	3,44	3,25	2,33	P<0.025
3	Détente (cm)	25,65±3,5	28,33±3,13	14,19	11,45	2,1	P<0.025
4	Throwing a tennis ball (cm)	13,13±1,39	15,56±0,75	2,97	26,59	5,24	P<0.0005

As shown in Table 3**, forehand cross court on target (20 hits),** for initial testing experiment group average was 7.16 hits, and at the end 9.86 hits. Mean difference between final and initial testing was 2.70 strokes, the initial testing variability coefficient is inhomogeneous, and the final is relatively homogeneous. Calculating the significance of the average experimental group there was a significant difference t = 5.27 to p <0.0005. **Forehand long line test on target (20 hits)** for initial testing experiment group average was 7.83 hits, and at the end of 10.28 hits. Mean difference between final and initial testing is 2.45 hits, and coefficient of variation for both tests is inhomogeneous. Calculating the significance of the average experimental group there was a significant difference t = 2.45 to p <0.025. For the experimental group, maintained forehand (20 hits) on initial testing average was 7.54 hits, and the final testing of 11.23 hits. Mean difference between final and initial testing is 3.69 hits, the coefficient of variation in initial testing is inhomogeneous, and the final is relatively homogeneous. Calculating the significance of the average experimental group there was a significant difference t = 3.53 to p <0.0005.

Table nr. 3 Analysis of results achieved in specific physical preparation parameters of athletes (experimental group) tested during the experiment (initial and final stage)

Nr. Crt.	Tested parametres	Testing		Statistical criteria C.V.%			
		Initial $\overline{X}$ ± DS	Final $\overline{X}$ ± DS	T.I.	T.F.	t	p
1	Forehand cross court at target (20 hits)	7,16±1,46	9,86±1,2	20,39	12,42	5,27	P<0.0005
2	Forehand long line at target (20 hits)	7,83±3,42	10,28±2,6	43,67	26	2,45	P<0.025
3	Mantained forehand	7,54±1,74	11,23±1,74	23,73	18,64	3,53	P<0.0005

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As shown in **Table 4**, for the experimental group at initial testing in **speed run distance of 30m**, the average was 6.28 sec. and the final of 6.20 sec. Mean difference between final and initial testing is 0.08 sec, and the coefficient of variation for both tests is homogeneous. Calculating the significance of the average experimental group there was a significant difference t = 1.65 to p <0.0005.

In long jump initial testing average for the experimental group was 1.17 m and 1.19 m in the final. Mean difference between final and initial testing is 0.02 m, and the coefficient of variation is relatively homogeneous in both tests. Calculating the significance of the average experimental group there was a significant difference t = 2.47 to p <0.0005.

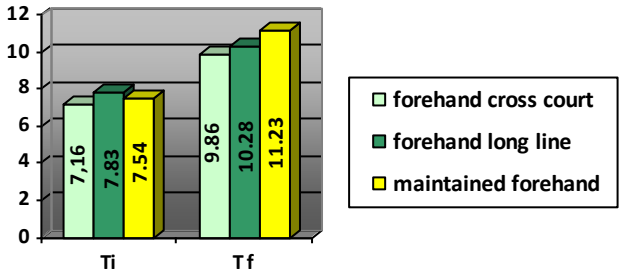

Figure 1. Dynamics of the experimental results achieved by the subjects during the experimental study
From the graphical representation (Figure 1) we can see the differences from one test to another for recorded performance of subjects experiment sample in the specific physical training test. RESULTS differences recorded averages highlights the effectiveness of the model in preparation for children beginners.

Table nr. 4 Analysis of results achieved for physical preparation parameters of athletes (control group) tested during the experiment (initial and final stage)

Nr. Crt.	Tested parametres	Testing		Statistical criteria C.V.%			
		Initial $\overline{X}$ ± DS	Final $\overline{X}$ ± DS	T.I.	T.F.	t	p
1.	Speed run on 30m (sec)	6,28±0,34	6,20±0,41	5,41	6,61	1,65	P>0.05
2.	Long jump (cm)	1,17±0,18	1,19±0,18	14,63	14,4	2,47	P>0.05
3.	High jump (cm)	26,5±5	27,83±4,26	18,86	15,3	1,06	P>0.05
4.	Throwing tennis ball (m)	12,89±2,6	13,38±2,11	20,17	15,76	1,27	p>0.05

In high jump (explosive power measured in centimetres), for initial testing experiment group average was 26.5 cm., and the final was 27.83 cm. Mean difference between final and initial testing is 1.33 cm., and coefficient of variation for both tests is relatively homogeneous. Calculating the significance of the average experimental group there was a significant difference t = 1.06 at p> 0.05.

For the experimental group for **tennis ball throwing test (m)**, initial testing average was 12.89 m and 13.28 m final at the mean difference between final and initial testing of 0.48 m. The coefficient of variation in initial testing is inhomogeneous, and the final is relatively homogeneous. Calculating the significance of the average experimental group there was a significant difference t = 1.27 at p> 0.05.

Tabel nr. 5 Analysis of results recorded parameters for specific physical preparation of athletes (control group) tested during the experiment (initial and final stage)

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Nr. Crt.	Tested parametres	Testing		Statistical criteria C.V.%			
		Initial $\overline{X}$ ± DS	Final $\overline{X}$ ± DS	T.I.	T.F.	t	p
1	Forehand cross court on target (20 hits)	7,16±1,46	8,66±1,2	20,39	12,42	1,92	P>0.05
2	Forehand long line on target (20 hits)	7,83±3,42	8,54±2,6	43,67	26	4,39	P>0.05
3	Mentained forehand	7,33±1,74	8,63±1,74	23,73	18,64	1,43	P<0.025

From the data recorded in Table 5 we can see that in case of **forehand cross court** test **(20 hits)** for the control group the average initial testing was 7,16 hits, and at the end was 8.66 hits. Mean difference between final and initial testing is 1.50 hits, the coefficient of variation in initial testing is inhomogeneous and the final is relatively homogeneous. Calculating the significance of the average experimental group there was a significant difference t = 1.92 at p> 0.05.\

Forehand long line on target (20 hits) for initial testing control group average was 7.83 hits, and the final testing was 8.54 hits. Mean difference between final and initial testing is 0.71 hits, coefficient of variation in initial testing is relatively homogeneous and the final is relatively homogeneous. Calculating the significance of the average experimental group there was a significant difference t = 4.39 to p <0.0005.

Maintained forehand (20 hits) for initial testing control group average was 7.33 hits, and the final testing was 8.63 hits. The same soft ball was used in the study of the beginners training by Francesco, R., 2003 and Steinhafel L., in 1995.

Mean difference between final and initial testing is 1.33 hits and coefficient of variation is relatively homogeneous at both tests. Calculating the significance of the average experimental group there was a significant difference t = 1.43 to p <0.025.

Conclusions

Bibliographic study allowed the development of structure and content of the training in the game of tennis at the age of 6-8 years;

By determining the levels of general and specific preparation were used general and specific physical preparation parameters specific to tennis game. Experimental results showed that at the age of 6-8 years children have a low level of physical preparation in the initial stage of the experiment. Development of a training plan and its implementation during a macro cycle led to improved results in the test subjects' general physical training as follows:

The long jump for the experimental group mean difference between final and initial testing is 0.05 m; there is a significant difference t = 2.39 to p <0.025 at final testing;

For height jump test the average difference between final and initial testing is 2.68 cm., and coefficient of variation for both tests is relatively homogeneous. Calculating significance of difference between the average experimental group there was a significant difference t = 2.1 p <0.025, from initial to final testing;

For the experimental group in throwing a tennis ball test, the mean difference between final and initial testing is 2.43 m and calculated significance of the difference between the average experimental group had a significant difference for t = 5.24 to p <0.0005.

At speed run on the distance of 30 m average difference between final and initial testing is 0.17 sec.; there is a significant difference t = 4.47 to p <0.0005 in final testing;

Training model application during training process caused an increase in the efficiency of learning basic strokes of tennis game so algorithmic systems that we have applied in preparing beginners tennis athletes has significant improvements in the group experiment in some tests as follows:

For forehand long line was an increase of 2.45 hits, t = 3.53 to be significant growth;

For forehand cross court was an increase of 2.70 hits, t = 5.27 to p <0.0005, being a significant increase;

For mentained forehand was an increase of 3.69 hits, t = 3.35 p <0.0005, being a significant increase.

Hypothesis that the composition and the application of specific algorithmic learning basic strokes of the game of tennis will help efficiency the training process were confirmed.

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THE EFFICIENCY OF TRAINING PLANNING IN AMPHIBIOUS CROSS-COUNTRY RACE

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Abstract
The efficiency of training planning for students' naval pentathlon team (mens) during a macro cycle is a very important factor for the sportive training in the amphibious cross-country race.
There was a lot of scientific and public discussion during the International Naval Championships annual edition on upper performance of amphibious cross-country race results. In this respect, the goal of this research is to analyses the team competition amphibious cross-country race participation results in 2012 International Military Naval Pentathlon Championships, Tusla, Turkey, after the macro cycle implementation model and before the 48th World Military Naval Pentathlon Championship, Berga, Sweden. The proposal of our study was to identify the dynamic statistic results after applied our macro cycle program (6 month). The subjects of this study were top-level 6 swimmers (20 years old) in Naval Academy "Mircea cel Batran", Constanta, Romania. After the statistic treatment we can determined the group average that shows significant difference between initial and final test. Highly significant differences were found between initial test and final test for each study parameters (all $p < 0.01$, n-1, Student Test, Fischer table). The statistical results of the experimental study led to a new coaching conception for the Navy Romanian team in amphibious cross country race. In our research the statistical treatment has demonstrated the significantly different between initial and final test. In that respect the comparative analyses in the amphibious cross-country event (start and run, shooting, running before water passage, water passage with rubber boat, and running before grenade throwing, finish) confirm the efficiency of training planning.
Key words: amphibious cross country, efficiency, training planning

Introduction

Naval Pentathlon is a military sport, wish started in Italy in the year of 1949 by the Italian Navy (www.forsvarsmakten.se). It was originally the Italian assault divers who started to train the different sports that today are included in the Naval Pentathlon. At the time, the sports creator conceived the idea of organizing a sport competition (Kirwan, J.P., Costill, D.L., Flynn, et al., 1988) for the navy to train and test the physical fitness and improves the general condition of the naval recruits.
The sport today is international and open equally for men and woman athletes.
Naval Pentathlon has five disciplines:
Obstacle race (305 meters) with 10 obstacles
Lifesaving swimming race (75meters) with 5 separate features with working dress
Utility swimming race (125 meters) with 6 separate features with swim-fins
Seamanship race (270 meters) with 7 separate features

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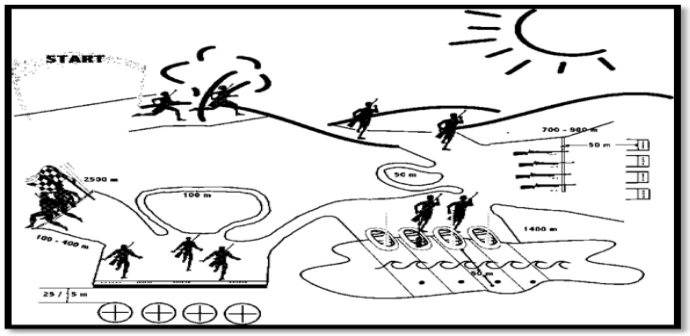
with land work and slalom rowing around buoys
Amphibious cross-country race (2500 meters) with 5 separate features with 50 meters shooting, 100 meters water passage paddling, 25 meters grenade throwing
Each competitor has to compete in all five disciplines wish demands an all-around physical training. Naval Pentathlon is considered as the ultimate fitness test for naval personal (Flyn, M. G., Pizza, F.X., Boone, J.B., 1994).
Naval Pentathlon is an individual, male and female, competition consisting of the following five events: obstacle race; lifesaving swimming race; utility swimming race; seamanship race; amphibious cross-country race. An "Individual champion" is determined by the overall result in the five events (Maglissho, E.W., 1993). The team champion is determined by adding the individual results of a country's team. The regulations prescribe the way a CISM (International Council of Military Sports) military world championship shall be conducted (CISM Regulations, 2009). I'm present in the next principal characters about 5nd event in naval pentathlon: amphibious cross-country. In this race (Appendices 1) the competitor shall perform in five (5) different features *(start and run, shooting, running before water passage, water passage with rubber boat, and running before grenade throwing, finish).*
The race shall take place in a location with suitable topographic conditions near a shooting range, bay, river or basin (Appendices 5.). The distance shall be 2500 m, including the paddling (without considering the distance of the penalty-run). In our research we want to present in the first step some general rules of the amphibious cross-country race (table 1).
Course markers shall properly mark the track at least every 100 m. Left and right turns should be clearly indicated. The track shall be placed on easily run ground e.g. hard earth/sand, grass, concrete or asphalt. No sharp (distinct) curves (>90°) or climbing hills (30%) are allowed (Appendices 2).
The dress for male competitors is optional competition dress and working dress (See sketch). The competitor's clothing shall be given to him just prior to his turn in this race. The use of a web belt shall be optional. The dress and equipment a competitor starts with must be worn/carried until the race is completed (e.g. if a competitor starts with shoes, he must complete the race with shoes).
Each male competitor shall carry a dummy-rifle during the race. It shall weigh about 3 kg and will be supplied to all the competitors by the sponsoring nation (Appendix 3). The rifle carried by the competitor shall not be used for the shooting feature of the race. The rifle can be carried by hand or slung over the shoulder without additional lashings to the body. No additional lashings also mean no additional padding may be added to the rifle. If the rifle provided to the competitor has a sling break, the competitor may accept no additional help from anyone (Appendices 4).

Table 1. Amphibious cross-country race



Amphibious cross-country race included 5 features (Naval Pentathlon Regulation, 2009) [1]:
Feature No. 1 - Start
Characteristics - Starting line drawn on the ground. Competitors shall receive the (dummy) rifle before the start of the race in ordered.
Conditions - Start and run.
Feature No. 2 - Shooting. Distance from the start at least 700 m, maximum 900 m. A flat platform for shooting, without support for the rifle.
Characteristics - A rifle (secured and not prepared for shooting), one magazine loaded with five cartridges, checked by the responsible of the rifle range (not loaded in the rifle) and three extra magazine with one cartridge in each magazine. All prepared (by a team-member) at the shooting range. There will be five targets per competitor. The targets are made of metal and functions as those used in the "Olympic Biathlon Competition". The diameters of the targets are 11.5 cm. The coach or team-member may prepare the rifle and make test shots but must not disturb any competitor. No assistance to the competitor shall be permitted during shooting.
No physical support (e.g. sandbags, boxes, bars) may be used other than provided by the sponsoring nation.

The sponsoring nation or team-member shall make a stand-by rifle available. The rifle must be secured and without a magazine/cartridge.

Condition - Shooting shall be performed from the prone position. All targets must be hit. Load the rifle with the magazine. Unsecured the rifle and shoot at the targets. If needed, reload the spare rounds one by one. Secure the rifle after completing the shooting.

If a competitor expends all his cartridges (1 magazine with 5 cartridges and three extra ones) and has not hit all the targets there will be a penalty of 50 m running per each target not hit. A judge will control the number of penalty rounds.

Feature No. 3 - *Water passage with rubber boat.* Distance from the start - at least 1500 m, maximum 1700 m.

Characteristics - Rubber inflatable boat of standard (not a one man rescue boat) type for one or two man with a single paddle. Length of course is a total of 100 m (female and male).

Condition - The boat shall be beached approximately 1 m from the water line and must be put in the water by the competitor. The competitor must take the passage with his rifle. Free-style rowing is allowed, as long as the paddle is used.

The start and finish of the water passage are marked. The boat and paddle shall be pulled up completely onto the beach or platform by the competitor after the paddling. The paddle may be left inside the boat. No assistance shall be permitted.

Feature No. 4 - *Grenade throwing* (Appendices 4). Distance from the start is at least 2100 m, not more than 2400 m.

Characteristics - Circular ring made of metal 5 cm in height and with a diameter of 2.00 m. The ring shall be placed on the ground with 25.00/15.00 m from the throwing barrier. The ring must be filled with a material (e.g. sand) which indicates a hit. The number of grenades a competitor can throw is up to six (6). The throwing barrier is approximately 200 x 10 x 10 cm. The grenades are placed on that barrier, in a fixed way, by the organizer (see sketch Obstacle Race No. 5).

Condition - The competitor throws the grenades so as to hit within the target ring. Hitting the ring does not constitute a hit, unless the grenade falls into the target area. Grenades shall be thrown over the shoulder one after another. For male competitors the rifle shall be kept by the competitor, either in his hand or slung over his shoulder. At no time shall it be placed, dropped or thrown on the ground.

The competitor will throw grenades from the barrier. Touching the barrier with the foot is permitted, but the competitor must not step on the barrier during grenade throwing (see sketch to Obstacle No. 5).

After hitting inside the ring the competitor continues running to the finish line.

If the competitor fails to hit inside the target with one of the six (6) grenades there will be a penalty of 100 m running. A judge will control the penalty rounds.

Feature No. 5 – *Finish.* Distance from the start is 2500 m. The finish line will be placed at least 100 m and not more than 400 m from the hand grenade throwing.

Characteristics - A finish marked with two posts and a finish line.

Condition - Pass the finish line. The final time shall be taken the moment the competitor crosses the finish line.

The description of components of experimental design:

Organization:

Research purposes: if we followed the preparation of amphibious cross country race becomes effective at all times proof by applying specific methods and training.

Hypothesis: it is assumed that the composition and the application of specific algorithmic system for the amphibious cross country, during a macro cycle will be efficiently into the planning for the training process

Objectives:

1. Study of theoretical concepts and practical experience of specialists in addressing the issue of streamlining the process
2. Study the parameters who give us the level of training for each stage of amphibious cross-country
3. Develop a training macro cycle to efficiently the training process
4. Theoretical considerations and experimental methods and means to streamline the process of preparing
5. based on the analysis and statistical processing model of research results confirm the efficiency of the training preparation

Experimental design used in practical design research

Research subjects, venue and stages of research:

Stage I includes bibliographic study of all authors in the literature of the field. This phase lasted from 15 March to 15 June 2011.

Stage II of lasted from 20 June to 20 October 2011 in which we chose research subjects. The subjects of this study were top-level 6 swimmers (20 years old) in Naval Academy "Mircea cel Batran", Constanta, Romania.

They were selected (after the commission selection process) from 250 students. Also at this stage we applied initial testing.

Stage III corresponded to period 25 October 2011 - 20 April 2012 which was designed and implemented new program designed to increase the efficiency of training process in amphibious cross-country. Also during this period, in the end they were applied again batteries of tests (final testing).

Experimental study approach

Methods

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The subjects of this study were top-level 6 swimmers (20 years old) in Naval Academy "Mircea cel Batran", Constanta, Romania.

They were selected (after the commission selection process) from 250 students. The method of developing a theoretical training macro cycle is as started below:

1. The technical elements of the 5th future amphibious cross-country race were analyzed based on an advanced swimmers technique.
2. Propose the coaching theory of the lifesaving race in coaching theory, the goal of coaching, coaching contents for every mezzo cycle, coaching materials and coaching program which was described in the process of coaching.
3. Make the coaching program which was described in the process of coaching.
4. Coaching program implementation in the macro cycle period.

Our study has 2 stage of testing (the first one – initial testing applied before the macro cycle implementation in the training program – and the second- final testing – after the experimental study and before the 48th World Military Naval Pentathlon Championship, Berga, Sweden. We made the final testing in according with five (5) different features *(start and run, shooting, running before water passage, water passage with rubber boat, and running before grenade throwing, finish)*.

For naval pentathlon we have allocate preparation and competition models specific all features. From this idea we propose a scientific program allocated in macro cycle. This macro cycle included five mezzo cycles: *Introductive mezzo cycles*: 01 October – 29 October - 4 weeks; *Remaking introductive mezzo cycles*: 30 October – 11 December - 6 weeks; *Base mezzo cycles*: 12 December – 12 March - 14 weeks; *Below contest mezzo cycles*: 13 March – 3 April – 3 weeks; *Contest mezzo cycles:* 4 April – 13 April - 2 weeks (table 2).

A coaching program [4], in fact a amphibious cross-country macro cycle training for 6 months, that subjects were able to learn a systematic technique tactics for the 5 features amphibious cross-country race was made. Table 2 shows the quantitative characteristic of the students' activities before and after applied the proposal program, in fact 105 hours for 5 mezzo cycle that: *Introductive mezzo* cycles - 12 hours; *Remaking introductive mezzo cycles* – 24 hours; *Base mezzo cycles* – 56 hours; *Below contest mezzo cycles* – 9 hours; *Contest mezzo cycles* – 4 hours.

Table 2. Coaching program for the Romanian naval student's team for amphibious cross-country race in the macro cycles period

Mezzo cycles		Introductive mezzo cycle	Remaking introductive mezzo cycle	Base mezzo cycle	Below contest mezzo cycle	Contest mezzo cycle	Total
Weeks		4	6	14	3	2	**29**
Nr. training /week.		8	8	10	8	5	
Total training/mezzo cycle (hour)		32 (64)	48 (96)	140 (280)	24 (48)	10 (20)	**254 (508)**
Start and run	Nr. our total obstacle race (weeks).	4	3	5	4	2	
	Total hour/ mezzo cycle	**16**	**18**	**70**	**12**	**4**	**120**
Shooting	Nr. our total lifesaving race (weeks).	3	4	4	3	2	
	Total hour/ mezzo cycle	**12**	**24**	**56**	**9**	**4**	**105**
Running before water passage	Nr. our total utility swimming race (weeks).	3	2	3	4	1	
	Total hour/ mezzo cycle	**12**	**12**	**42**	**12**	**2**	**80**
Water passage with rubber boat	Nr. our total seamanship race (weeks).	4	4	5	4	2	
	Total hour/ mezzo cycle	**16**	**24**	**70**	**12**	**4**	**126**
Running before grenade throwing	Nr. our total amphibious cross-country race (weeks).	3	4	2	3	2	
	Total hour/ mezzo cycle	**12**	**24**	**28**	**9**	**4**	**77**

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In table number 3 we shows the results comparative analyses in the amphibious cross-country event between the students team member in the initial and the final test. After the registration we made the statistic treatment (table 4) on the following statistical parameters: average, coefficient of variation and significantly different. Concerning the results obtained we develop the interpretation of our results.

In start and run, for initial testing average was 185 sec., and the final of 175sec. Mean difference between final and initial testing of 10 sec., and coefficient of variation for both tests is homogeneous. Calculating the significance of the average on final test there was a significant difference t = 17,321 p <0,01.

In shooting, for initial testing the average was 34 sec., and 26sec. on final testing at the mean difference between final and initial testing is 8sec., and the coefficient of variability of both tests is homogeneous. Calculating significance of difference between the average experimental group there was a significant difference t = 18,891 to p <0,01.

In running before water passage for initial testing average was 160sec., and the final of 152sec. Mean difference between final and initial testing of 8sec., and coefficient of variation for both tests is relatively homogeneous. Calculating significance of difference between the average there was a significant difference t = 7,171 p <0.025, from initial testing to final testing.

For our team **water passage with rubber boat,** initial testing average was 72sec., and 58sec., final at the mean difference between final and initial testing of 14sec., and the coefficient of variation in initial testing is homogeneous and the final is not homogeneous. Calculating the significance of the average there was a significant difference t = 29,493 to p <0,01.

As shown in table 4**, running before grenade throwing** for initial testing group average was 120sec., and at the end of event the average was 102sec. Mean difference between final and initial testing was 18sec., and the coefficient of variation is inhomogeneous on the initial test, and the final is relatively homogeneous. Calculating the significance of the average there was a significant difference t = 16,195 to p <0,01.

Grenade throwing for initial testing group average was 35sec., and at the end of was 28sec. Mean difference between final and initial testing of 7sec., and coefficient of variation for both tests is inhomogeneous. Calculating the significance of the average results group there was a significant difference t = 15,038 to p <0,01.

For our subjects **finish event** has 96sec., the average on initial test and 87sec., on final test. The coefficient of variation in initial testing is inhomogeneous, and the final is relatively homogeneous. Calculating the significance of the average on the final test there was a significant difference t = 22,407 to p <0,01.

Table 3. Comparative analyses results in the amphibious cross-country event

Nr.	Name	Parametric	Initial test	Final test
1	A	**Start and run (sec.)**	**179.0**	**168.0**
	B		**181.5**	**173.5**
	C		**185.0**	**175.0**
	D		**186.0**	**177.0**
	E		**184.5**	**172.5**
	F		**194.0**	**184.0**
2	A	**Shooting (sec.)**	**31.5**	**24.2**
	B		**33.2**	**25.7**
	C		**34.0**	**26.0**
	D		**36.1**	**26.5**
	E		**35.8**	**27.0**
	F		**33.4**	**26.6**
3	A	**Running before water passage (sec.)**	**158.3**	**149.7**
	B		**159.5**	**150.2**
	C		**160.0**	**152.0**
	D		**163.5**	**153.7**
	E		**164.9**	**155.2**
	F		**153.8**	**151.2**
4	A	**Water passage with rubber boat (sec.)**	**70.3**	**56.8**
	B		**71.1**	**57.0**
	C		**72.0**	**58.0**
	D		**73.4**	**58.6**
	E		**74.5**	**59.0**
	F		**70.7**	**58.6**

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5	A	**Running before grenade throwing (sec.)**	**117.9**	**100.1**
	B		**119.6**	**101.2**
	C		**120.0**	**102.0**
	D		**122.3**	**102.9**
	E		**124.6**	**103.3**
	F		**115.6**	**102.5**
6	A	**Grenade throwing (sec.)**	**33.9**	**26.5**
	B		**32.8**	**24.7**
	C		**35.0**	**28.0**
	D		**35.7**	**28.2**
	E		**36.6**	**29.4**
	F		**36.0**	**31.2**
7	A	**Finish (sec.)**	**93.2**	**85.0**
	B		**95.6**	**86.1**
	C		**96.0**	**87.0**
	D		**97.7**	**88.0**
	E		**98.2**	**88.1**
	F		**95.3**	**87.8**

Grenade throwing for initial testing group average was 35sec., and at the end of was 28sec. Mean difference between final and initial testing of 7sec., and coefficient of variation for both tests is inhomogeneous. Calculating the significance of the average results group there was a significant difference $t = 15,038$ to $p < 0,01$.

For our subjects **finish event** has 96sec., the average on initial test and 87sec., on final test, like in the Maglissho, E.W., (1993) study.

The coefficient of variation in initial testing is inhomogeneous, and the final is relatively homogeneous. Calculating the significance of the average on the final test there was a significant difference $t = 22,407$ to $p < 0,01$.

Finally the comparative analyses results in the amphibious cross-country event evidence in the end of testing a significantly different then total, $t = 19,339$ to $p < 0,01$. In our study we have applied the same psychological methods in succesive days for obtaining the intensive training like Kirwan, J.P., Costill, D.L., Flynn, M. G., Mitchel, J. B., Fink, W. J., Neufer, P.D., in 1988.

Figure nr. 1 illustrates a highly significant influence of training macro cycle on balance performance. The group average shows significant difference between initial and final test like follow: 10 sec. recovered for start and run feature; 14 sec. recovered for water passage with rubber boat on feature; 7 sec. recovered for grenade throwing; 9 sec. recovered for the finish recovery. Highly significant differences were found between initial test and final test for all study parameters (all $p < 0.01$, n-1, Student Test, Fischer table).

Table 4. Amphibious cross-country

		Start and run (SR) (s.)	Shooting (S) (s.)	Running before water passage (RBWP) (s.)	Water passage with rubber boat (WPRB) (s.)	Running before grenade throwing (RBGT) (s.)	Rrenade throwing (GT) (s.)	Finish (F) (s.)	Totals (T) (s.)
Initial testing (IT)	M±SD	185±5,109	34±1,726	160±3,946	72±1,649	120±3,174	35±1,421	96±1,801	702±13,115
	CV (%)	2.762	5.076	2.466	2.29	2.645	4.06	1.876	1,868
Final testing (FT)	M±SD	175±5,339 †	26±0,994 ‡	152±2,112 ▲	58±0,912 ▼	102±1,183 ◄	28±2,253 ►	87±1,238 ↑	628±11,735 ■
	CV (%)	3.051	3.823	1.389	1.572	1.16	8.046	1.423	1,869

† significantly different then SR, initial testing, t=17,321, p<0,01;
‡ significantly different then S, initial testing, t=18,891, p<0,01;
▲ significantly different then RBWP, initial testing, t=7,171, p<0,01;
▼ significantly different then WPRB, initial testing, t=29,493, p<0,01;
◄ significantly different then RBGT, initial testing, t=16,195, p<0,01;
► significantly different then GT, initial testing, t=15,038, p<0,01;
↑ significantly different then F, initial testing, t=22,407, p<0,01;
■ significantly different then T, initial testing, t=19,339, p<0,01;
s, seconds.

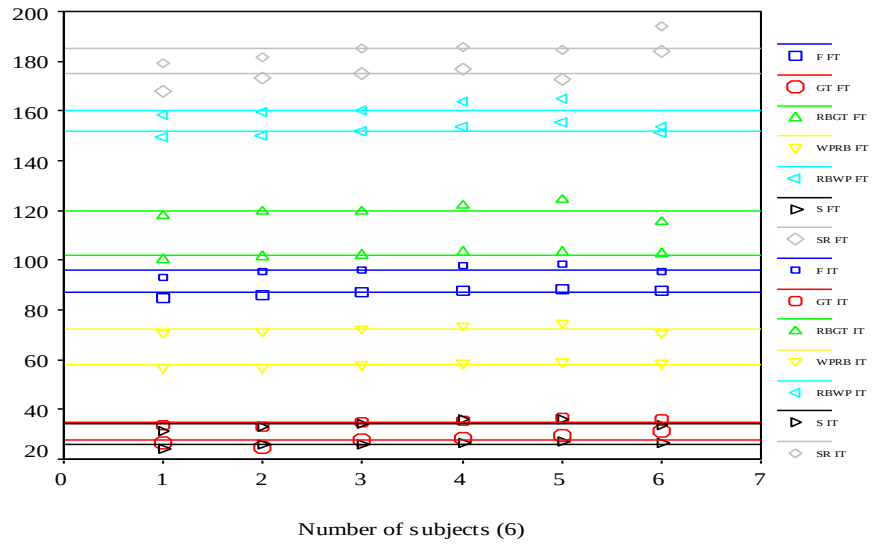

Figure 1. Individual values and mean times for each segment of Amphibious Cross-Country in final testing (FT) and initial testing (IT). Legend: SR, start and run; S, shooting; RBWP, running before water passage; WPRB, water passage with rubber boat; RBGT, running before grenade throwing; GT, grenade throwing; F, finish; s, seconds.

Conclusions

The present study provides the new data to reinforce the conceptual distinction between the naval pentathlon events. Obtained data suggest that the macro-cycle model in the amphibious cross-country race was used rational in the optimal weeks and hours/weeks for training in two directions (technical and tactical ways). The statistical results of the experimental study led to a new coaching conception for the Navy Romanian team. We can appreciate in this case the training program because in 2012 of the International Military Naval Pentathlon Championships, Tusla, Turkey (before the 48th World Military Naval Pentathlon Championship, Berga, Sweden), our team has occupied 3rd place in the general race classifications system.

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ASSESSMENT OF AEROBIC GYMNASTICS BY VIDEO ANALYSIS

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Abstract

Purpose. The Aerobic Gymnastics is a complex sport and the movements are performed continuously, intensely at high speed with the musical accompaniment. One can directly assess the overall performance to the naked eye, but is not able to assess the individual elements of movement and technical aspects (Raiola, 2012). The video analysis indirectly, through the ability to stop and review the various stages of movement several times, facilitates the evaluation. The aim of this study is to verify whether the use of video analysis in daily training activities can facilitate the evaluations of the coaches.
Methods. 4 female athletes will be evaluated using the tabs in the Code of Points with annotations for deductions (0.10 slight error, mean error 0:20, 0:50 fault) and after 30 sessions in two different ways. The athletes are divided into two groups: 1) Control which continues to be evaluated with the traditional forms, 2) Experimental which is evaluated through the use of two cameras, one placed opposite to the athlete and the other one on t222he side, which apply the points of repelle on specific anatomical points. At the end all the athletes will be traditionally evaluated and one will compare the assessments to highlight the difference between the two groups.
Results. . The athletes in the experimental group improved at 0.30 and 0.40 compared to initial assessments made without the video analysis and compared to the control group. The experimental group compared with the control group has a better final evaluations in the matter of execution and cleanliness of the gesture. Probably the rapidity of correction of the act requested by the coach after watching the video and the subsequent execution of the athlete support proper execution.
Conclusions. This new training methodology may be also tested on athletes, in order to allow a self-assessment through the measurement of the movie and the subsequent correction of performance so that it can better understand the errors committed and implicitly suggest the correction. The simultaneous use of video analysis by athletes and coaches during the training could further improve the result.

Keywords: Didactics, Training methodology, Code of points.

Introduction

The Aerobic Gymnastics is a complex sport and the movements are performed continuously, intensely at high speed with the musical accompaniment (Code of Points, 2013-2016). Gymnastics may be globally defined as any physical exercise on the floor or apparatus that promotes endurance, strength, flexibility, agility, coordination, and body control (Peter Werner, Lori Williams, Tina Hall, 2012). One can directly assess the overall performance to the naked eye, but is not able to assess the individual elements of movement and technical aspects (Raiola, 2012). The video analysis indirectly, through the ability to stop and review the various stages of movement several times, facilitates the evaluation. Aerobic Gymnastic is the ability to perform complex movements produced by the traditional aerobic exercises, in a continuous manner, with high intensity, perfectly integrated with soundtracks. This sport is performed in a aerobic/anaerobic lactacid condition and expects the execution of complex movements produced by the traditional aerobic exercises integrated with difficulty elements performed with a high technical level. An inaccuracy about this sport is related to the name itself "aerobic" because Aerobic Gymnastic does not use just the aerobic work during the competition, due to the fact that the exercises last among 1'30" and 1'45" at high rhythm. Agonistic Aerobics exploit the basic movements of amateur Aerobics and its coordination schemes, even though the agonistic Aerobics is so much intense than the amateur Aerobics to need a completely different mix of energetic mechanisms. Due to the complexity and the speed with which you perform the technical elements of Aerobic Gymnastic, the introduction of video analysis is essential for a qualitative and quantitative evaluation of athletes' performance during the training. "The performance analysis can enable the accurate analysis and explanation of the evolution and dynamics of a historical phenomenon and motor sports" (Hughes and Bartlett, 2002). "The notational analysis is used by technicians to have an objective analysis of

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performance. Tactics, technique and individual movements can be analyzed to help coaches and athletes to re-evaluate their performance and gain advantage during the competition "(Hughes and Franks, 2004). The purpose of the following experimental work will be a starting point for analyzing the performance of the athletes in an objective way, not only during competitions, but especially during the phases of training. It is, therefore, advisable to introduce the video analysis and notational analysis for more quantitative and qualitative examination of technical movements. The goal is to lead to an improvement of the technique of the athlete and the teaching of the coach.

Method

4 female athletes will be evaluated using the tabs in the Code of Points with annotations for deductions (0.10 slight error, mean error 0:20, 0:50 fault) and after 20 sessions in two different ways. The athletes are divided into two groups: 1) Control which continues to be evaluated with the traditional forms, 2) Experimental which is evaluated through the use of two cameras, one placed opposite to the athlete and the other one on the side, which apply the points of repelle on specific anatomical points. At the end all the athletes will be traditionally evaluated and one will compare the assessments to highlight the difference between the two groups.

Discussion

After experimenting with several athletes on the effectiveness of video analysis for the teaching of certain gestures engines, the coach can test the validity or otherwise of performance analysis for athletes. You can revise the method for helping athletes in self-movements during training, to achieve a greater awareness of the executive and correct their mistakes more quickly than before. The rapidity of correction of the act requested by the coach after watching the video and the subsequent execution of the athlete support proper execution. At the end of the work will be introduced new evaluation boards similar to those used by the judges during the competition, for an objective analysis even during workouts. This new training methodology may be also tested on athletes, in order to allow a self-assessment through the measurement of the movie and the subsequent correction of performance so that it can better understand the errors committed and implicitly suggest the correction. The simultaneous use of video analysis by athletes and coaches during the training could further improve the result. From the results it is evident how the video analysis may increase in a positive manner the execution of gestures engines of athletes. Using the video analysis as a method of constant evaluation, the technician will reevaluate its educational strategy to help in times more short athletes to correct errors that were easily seen with the naked eye. In addition, the athlete will improve the performance of the act making it perfect given the thorough processing of the results you can get with the video analysis. The video analysis indirectly, through the ability to stop and review the various stages of movement several times, facilitates the evaluation.

Conclusions

The aim of this study is to verify whether the use of video analysis in daily training activities can facilitate the evaluations of the coaches. This project therefore provides an improved evaluation of athletic performance that will be analyzed in a more objective and analytical way, with video analysis, than those commonly used by direct observation, trying to give an explanation for any technical error with tools ever used in Aerobic Gymnastic.

Result

Table 1. Evaluation method with video-analysis

Prima valutazione con video analisi: atleta sperimentale				
Nome elemento	Valore elemento	Voto da 0 a 10	Deduzione	
Push Up	0,1	7	0	
Straddle Support	0,2	6	0,1	
Air Turn	0,3	7	0,2	
Split Trought	0,3	7	0,2	
TOT.	0,9	27	0,4	**TOT. 0,5**

Quinta valutazione con video analisi: atleta sperimentale				
Nome elemento	Valore elemento	Voto da 0 a 10	Deduzione	
Push Up	0,1	7	0	
Straddle Support	0,2	7	0,1	
Air Turn	0,3	7	0,1	
Split Trought	0,3	7	0,1	
TOT.	0,9	28	0,3	**TOT. 0,6**

Decima valutazione con video analisi: atleta sperimentale				
Nome elemento	Valore elemento	Voto da 0 a 10	Deduzione	
Push Up	0,1	8	0	
Straddle Support	0,2	7	0,1	
Air Turn	0,3	8	0	
Split Trought	0,3	7	0,1	
TOT.	0,9	30	0,2	**TOT. 0,7**

Quindicesima valutazione con video analisi: atleta sperimentale				
Nome elemento	Valore elemento	Voto da 0 a 10	Deduzione	
Push Up	0,1	8	0	
Straddle Support	0,2	7	0,1	
Air Turn	0,3	8	0	
Split Trought	0,3	8	0	
TOT.	0,9	31	0,1	**TOT. 0,8**

Ventesima valutazione con video analisi: atleta sperimentale				
Nome elemento	Valore elemento	Voto da 0 a 10	Deduzione	
Push Up	0,1	9	0	
Straddle Support	0,2	8	0,1	
Air Turn	0,3	9	0	
Split Trought	0,3	9	0	
TOT.	0,9	35	0,1	**TOT. 0,8**

Table 2. Results with video analysis

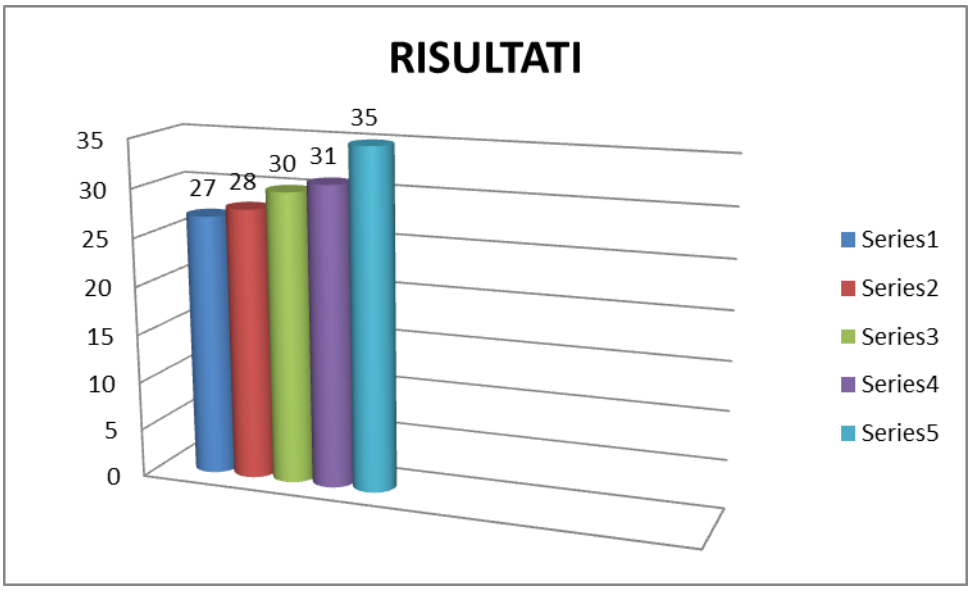


Table 3. Evaluation method without video-analysis

Prima valutazione senza video analisi: atleta controllo				
Nome elemento	Valore elemento	Voto da 0 a 10	Deduzione	
Push Up	0,1	7	0	
Straddle Support	0,2	6	0,1	
Air Turn	0,3	7	0,2	
Split Trought	0,3	7	0,2	
TOT.	0,9	27	0,4	

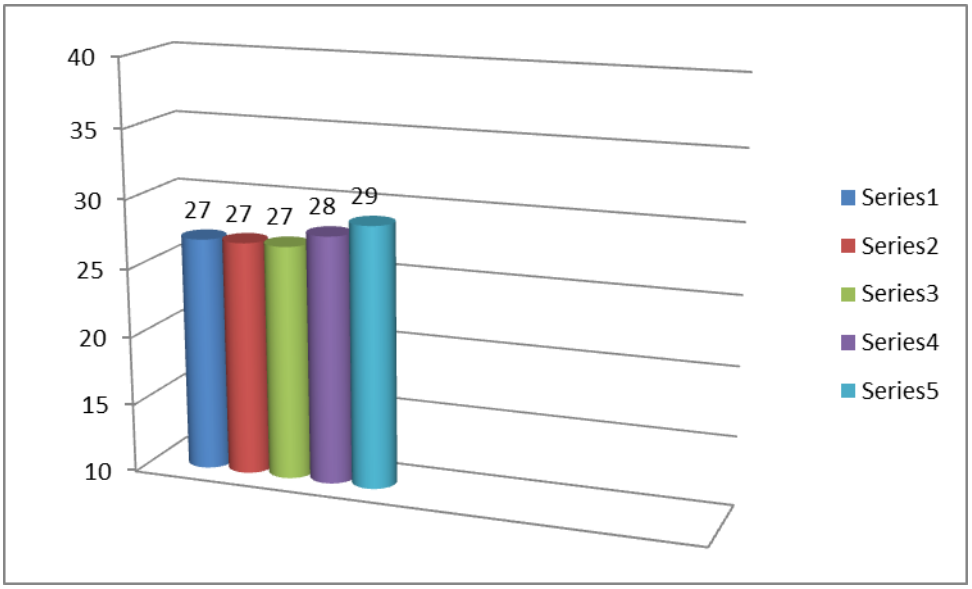
Quinta valutazione senza video analisi: atleta controllo				
Nome elemento	Valore elemento	Voto da 0 a 10	Deduzione	
Push Up	0,1	7	0	
Straddle Support	0,2	6	0,1	
Air Turn	0,3	7	0,2	
Split Trought	0,3	7	0,2	
TOT.	0,9	27	0,4	**TOT. 0,5**

Decima valutazione senza video analisi: atleta controllo				
Nome elemento	Valore elemento	Voto da 0 a 10	Deduzione	
Push Up	0,1	7	0	
Straddle Support	0,2	6	0,1	
Air Turn	0,3	7	0,2	
Split Trought	0,3	7	0,2	
TOT.	0,9	27	0,4	**TOT. 0,5**

Quindicesima valutazione senza video analisi: atleta controllo				
Nome elemento	Valore elemento	Voto da 0 a 10	Deduzione	
Push Up	0,1	7	0	
Straddle Support	0,2	7	0,1	
Air Turn	0,3	7	0,1	
Split Trought	0,3	7	0,1	
TOT.	0,9	28	0,3	**TOT. 0,6**

Ventesima valutazione senza video analisi: atleta controllo				
Nome elemento	Valore elemento	Voto da 0 a 10	Deduzione	
Push Up	0,1	8	0	
Straddle Support	0,2	7	0,1	
Air Turn	0,3	7	0,1	
Split Trought	0,3	7	0	
TOT.	0,9	29	0,2	**TOT. 0,7**

Table 4. Results without video analysis



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EFFECT OF FUNCTIONAL STRENGTH TRAINING ON CERTAIN PHYSICAL AND PHYSIOLOGICAL VARIABLES AMONG YOUNG FEMALE HANDBALL PLAYERS

HEBA LABIB[1]

Abstract

*Purpose***.**Functional strength training involves performance work against resistance in such a manner that the improvements in strength directly enhance The performance of movements so the an individual's activities of daily living are easier to perform simply stated, the primary goal of functional training is to transfer improvements in strength achieved in one movement to enhance the performance of other movements by affecting the entire neuromuscular system. The aim of this study was to investigate that Effect of functional strength training on oxidative stress and certain physical variables for young Handball players.

*Methods.*Twenty young handball female players, divided into (2) group. The experimental group (n = 10 female players) performance functional strength training And control group (n = 10 female players) performed traditional exercise. Blood and urine samples were collected before and after (10) weeks. Serum uric acid (UA), creatine phosphokinase and urinary malondialdehyde (MDA) were evaluated. As markers of oxidative damage to lipids and proteins, statistical analysis of the results was carried out with the use of SPSS software.

*Results***.**The experimental group had significantly higher than the control group in Serum uric acid (UA), and creatine phosphokinase and urinary malondialdehyde (MDA), and the experimental group had significantly higher than the control group on a core stability test, balance . In addition, No significant difference was found between the experimental group and the control group in power and strength .

*Conclusion***.**Under the condition of our study, functional strength intervention for twelve weeks has a beneficial effect on oxidative stress and core stability test, balance of Handball players.

*Key words***.** Functional Training, Handball players, Strength. Balance.

Introduction

The goal of exercise programs is to provide the body with an adaptation. An adaptation is an enhancement of bodily movements, resulting in aesthetic or athletic improvements.

The movement theory mimics daily and sporting actions and helps the body improve these activities, which is an adaptation. Training muscles increase their strength. This is an adaptation.

The theory that works best is a combination of training muscles and movements. Training a movement will make the body move more efficiently. At the same time, if a muscle is weak, the fastest way to make it stronger is to isolate it. Train the movement first because a movement requires more energy. Train the muscle second. The combination of movements and muscles is hard to beat (Christine, 2000).

Functional training is old news in the sports and rehabilitation world, but it wasn't until just a few years ago that it really came to my attention because I started

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seeing it catch on in a big way inside our health clubs. All of a sudden, the trainers had medicine balls, core balls, core boards, rubber tubing, stability balls, rollers and foam pads all over the place, whereas just five years ago, there wasn't a ball to be found in the entire joint (Michael, 2004).

The idea behind functional strength training is that the body is integrated, with hundreds of muscles working together to perform a variety of functions. Functional programs are designed to mimic everyday activities. These activities range from moving furniture to swinging a golf club. (J. Ron, 2003)

Functional strength training simply means training our bodies to better perform the types of movements we use for everyday living. The time spent developing this specific strength, flexibility and agility have the optimum carry-over into daily activities (Mackelvie, et al., 2002).

Functional Strength is a combination of all elements of fitness to produce peak performance for your specific needs. Whether your goal is to look better, feel better, or perform better - Functional Strength Training will help you achieve your fitness goals. Functional Strength begins with a thorough evaluation of your current fitness level to uncover your strengths and weaknesses. Based on the results of your evaluation, a program will be designed to complement your strengths and improve your weak points (Michael, 2004).

Functional Strength goes beyond where some fitness programs fall short. We realize that to have strength requires a balance of joint mobility, endurance, muscle flexibility, balance, speed, agility, quickness, body composition, and "mindfulness"; as well as attention to appropriate rest/sleep, nutrition, medical health, and stress levels. Our programs vary for everyone to include all aspects of fitness (Maryg, 2003).

As a strength and conditioning coach for college Handball players, there are four goals that must be accomplished with my strength training program. These goals include:

1. Increase maximum strength
2. Increase explosiveness
3. Enhance functional movement
4. Prevent injury

The best way to increase maximum strength is by training with a basic Powerlifting routine. My training program incorporates maximum effort lifts and dynamic effort lifts for the main movements. These exercises are done in the 1–5 rep range and are performed explosively, usually between 70–80 percent of a max. Explosiveness is achieved in two ways. The first is through the dynamic effort lifts of Powerlifting program. The second way train for explosiveness is by incorporating Plyometrics into the programs. And Enhanced functional movement is achieved through exercises that relate directly to the movements that my Handball players will use on the mat. Wrestling involves a lot of core movement, especially in the hips. To improve strength in this area, a lot of medicine ball work. Woodchoppers are not only a great way to increase functional strength but can also act as a good warm up.

Continuing the exercise an adaptation of the cardiovascular system is verified, with the increase of the cardiac rhythm and cardiac force, increase of the arterial pressure, adaptation of the respiratory system, increase of the sanguineous flow, the increment of the metabolism, the rise of the glucose concentration in the blood, increase of glycolysis in the liver and muscle. All these factors, inset, contribute to a good performance of the physical exercise (Guyton, & Hall, 1998). The presence of oxygen, although indispensable, can become dangerous, promoting oxidative stress. The increase of the volume of oxygen favours the production of reactive oxygen species (ROS), unchaining of oxidative stress, with all the baleful consequences (Sayre, et al., 2001; Sousa, et al., 2005). The ROS increase can compromise the antioxidant (chemical and enzymatic) defence available in the organism.

Free radicals are capable of independent existence and are produced in all living cells.

Reactive oxygen species (ROS) or reactive nitrogen species (RNS), e.g., superoxide (O2), hydroxyl (OH•), alkoxyl (RO•), peroxyl (ROO•), and hydroperoxide (ROOH) can oxidize other biological molecules, including carbohydrates, amino acids, fatty acids and nucleotides.

Previous data shows the high level of lipid peroxidation from detection the malondialdehyde (MDA) represented the oxidative stress in the body (Halliwell and Gutteridge, 1999). Scavenging of all free radicals produced in vivo by both enzymatic- and non-enzymatic antioxidants usually occur. Antioxidant enzymes include superoxide dismutase, glutathione peroxidase and catalase. The main non-enzymic antioxidants include glutathione (GSH), vitamin E and vitamin C (Cooper et al., 2002) proposes to total antioxidant capacity (TAC) in the biological system. The potential sources of free radical generation in exercising muscle are mainly from mitochondria, xanthine oxidase, prostanoid metabolism, catecholamines, NAD (P) H oxidase and secondary sources such are phagocytosis or calcium accumulation (Jackson, 2000).

The aim of this study was to investigate that Effect of functional strength training on oxidative stress and certain physical variables for young Handball players.

Material and Methods

Experimental Approach to the Problem

Two groups (experimental and control) performed a pre and post - training designed intervention in which Vertical Jump Test (VJ), Seated Medicine Ball Throw (SMBT) , leg strength (LS) back

strength (BS) by the dynamometer , Dynamic strength test (DST) and Performance levels of landing in floor exercise (LFE) were recorded. The experimental group (EG) (10 young Handball players) trained 1 hour per day 3 times a week on functional training besides the wrestling training for ten weeks. The control group (10 young Handball players) continued their normal training, while the experimental group completed a functional training program to see whether this type of training modality would have a positive or negative or no effect on (VJ), (SMBT), (LS) and (PLL).

Samples

Twenty young Handball players, divided into (2) group. The experimental group (n = 10) performance functional strength training And control group (n = 10) performed traditional exercise. Blood and urine samples were collected before and after (10) weeks. Serum uric acid (UA), creatine phosphokinase and urinary malondialdehyde (MDA) were evaluated. As markers of oxidative damage to lipids and proteins. Subject's parents and coaches were required to read and complete a health questionnaire and informed consent document; there was no history of injuries, diabetes or recent surgery.

Testing Procedures

Subjects were assessed before and after a 10-weeks of complex training program All measurements were taken one week before and after training at the same time of day. Tests followed a general warm-up that consisted of running, calisthenics, and stretching.

Static strength test (LS) (BS)

A Takei leg and back dynamometer was used to measure the static leg strength. The subjects stood on the dynamometer platform and crouched to the desired leg bend position, while strapped around the waist to the dynamometer. At a prescribed time they exerted a maximum force straight upward by extending their legs. They kept their backs straight, head erect and chest high. 3 trials were allowed to the subjects and the best score was taken. Subjects had a rest between the trials (Jensen & Fisher).

Standing Stork Test (SST):

To assess the ability to balance on the ball of the foot.

The athlete Remove the shoes and socks (they might cause you to slip or gain extra leverage). Place your hands on your hips.

Place one foot flat against the inside of the other leg's knee.

There should be one foot that is resting flat on the floor (the one you're standing on) – lift your heel off the ground and put all of your weight on the ball of that foot.

The athlete should practice for about a minute before testing and the test begins counting from the moment you lift your heel from the ground

Hand Grip Strength Test

The purpose of this test is to measure the maximum isometric strength of the hand and forearm muscles.

The subject holds the dynamometer in the hand to be tested, with the arm at right angles and the elbow by the side of the body. The handle of the dynamometer is adjusted if required - the base should rest on first metacarpal (the heel of the palm), while the handle should rest on middle of four fingers. When ready the subject squeezes the dynamometer with maximum isometric effort, which is maintained for about 5 seconds. No other body movement is allowed. The subject should be strongly encouraged to give a maximum effort.

Dynamic balance

Dynamic balance is very important in sports which need to many joint awareness, and overall proprioception. Balance test investigated by 5 m-timed-up-and-go-test (5m-TUG). Subjects performed 5-TUG with time taken to rise from a chair, walk a set distance 5 m, turn around, walk back and sit down. Each subject was given 2 practice trials performed to familiarize. All subjects completed three trials with 1 min recovery between trials. The less time for each trial was recorded.

Blood test

Blood is drawn from a vein (venipuncture), usually from the inside of the elbow or the back of the hand. A needle is inserted into the vein, and the blood is collected in an airtight vial or a syringe. Preparation may vary depending on the specific test.

Statistical analysis

All statistical analyses were calculated by the SPSS statistical package. The results are reported as means and standard deviations (SD). Differences between two groups were reported as mean difference ±95% confidence intervals (meandiff ± 95% CI). Student's t-test for independent samples was used to determine the differences in fitness parameters between the two groups. The $p<0.05$ was considered as statistically significant.

RESULTS

Table 1. Anthropometric Characteristics Training experience of the Groups (Mean ± SD)

Group	N	Age [years]	Weight [kg]	Height [cm]	Training experience [years]
Experimental	10	13 ± 1.5	44 ± 2.7	147 ± 2.95	3 ± 0.7
Control	10	14 ± 1.8	42 ± 3.4	148 ± 3.11	3 ± 0.8

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Table 1 shows the age and anthropometric characteristics of the subjects. There were no significant differences were observed in the anthropometric characteristics and Training experience for the subjects in the different groups.

Table 2. Mean ± SD and " T" Test between the two Groups (experimental and control) in Dynamic balance , Hand Grip Strength , Static strength test (LS) (BS) and Performance level of running a shoot

Variables	Experimental group		Control group		T test	Sign.
	Before	After	Before	After		
Standing Stork Test	32.11 ±2.09*	38.31 ±3.11	32.74 ±3.19	33.85 ±2.89	4.60	S
Dynamic balance	10.16 ±1.15*	12.46 ±1.43	9.92 ±0.87	10.03 ±1.08	5.93	S
Handgrip Strength	25.68 ±2.54	26.16 ±2.63	25.31 ±2.46	25.87 ±3.02	0.32	NS
Static strength test (LS)	59.42 ±3.84	62.22 ±4.89	59.25 ±4.26	60.74 ±4.38	0.98	NS
Static strength test (BS)	37.51 ±4.26*	45.22 ±3.79	38.05 ±4.37	40.31 ±3.28	4.27	S
Performance level	3.01 ±0.41*	4.13 ±0.73	2.97 ±0.59	3.06 ±0.62	4.86	S

Table 2 shows that:
Significant Difference between the experimental group and control group in Standing Stork Test , Dynamic balance. Static strength test (BS) and Performance level of Running shoot for posttest to the experimental group.
No Significant Difference between two groups in Handgrip Strength and Static strength test (LS)

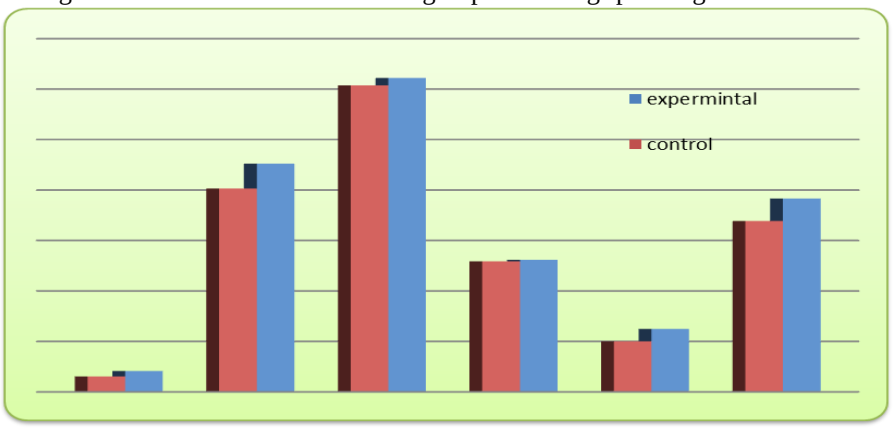

Fig 1 shows the differences between the two groups (experimental and control) in Dynamic balance , Hand Grip Strength , Static strength test (LS) (BS) and Performance level of running a shoot

Table 3. Mean ± SD and " T" Test between the two Groups (experimental and control) in malondialdehyde (MDA), creatine phosphokinase (CPK) and Serum uric acid (UA)

Variables	Experimental group		Control group		T test	Sign.
	Before	After	Before	After		
MDA (mmol/L)	11.09 ±0.65*	10.11 ±0.58	11.11 ±0.37	11.10 ±0.88	4.13	S
CPK (umol/L)	185.22 ±18.25*	197.46 ±17.73	181.87 ±15.64	183.08 ±17.11	2.55	S
UA (umol/L)	298.78 ±49.74	277.61 ±63.63	283.41 ±38.46	275.87 ±55.02	0.09	NS

Table 3 shows that:
Significant Difference between experimental group and control group in malondialdehyde (MDA), creatine phosphokinase (CPK) for posttest to the experimental group.

No Significant Difference between two groups in Serum uric acid (UA)

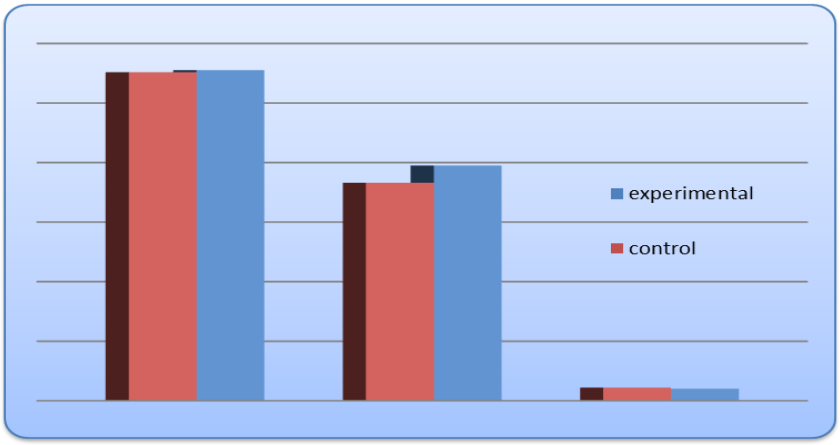

Fig 2 shows the differences between the two groups (experimental and control) in malondialdehyde (MDA), creatine phosphokinase (CPK) and Serum uric acid (UA)

Discussion

This study assessed the effects of an 10-weeks functional training program, on the powerful , complex movement performances, total protein , albumin concentration and erythrocyte SOD activities. Experimental results indicated that all variables were significantly increased in the experimental group only after the contrast training program.

The researchers believed that , the training program which designed and implicated on the experimental group were affected and improvement this variable .

Exercise is not just important for general health, it helps build bone mass in youth and slows down bone loss in adults. Exercise is also a factor in helping to reduce the risk of falls as it strengthens muscles, increases flexibility, and improves coordination and balance. During physical activity bones receive messages that they need to work and be strong. When there is a lack of exercise, bones does not receive these messages and lower bone mass can result. Regular physical activity on a long-term basis maintains the benefits of Cardio Health (Cress, et al., 1996).

Both research and anecdotal evidence suggest that functional strength training leads to better muscular balance and joint stability, which in turn results in fewer injuries and increased performance

Current research shows that using natural, continuous, and integrated movements incorporating the use of gravity along with your own body weight or free weights is the best approach to building strength. This type of strength training is called "functional strength training".

Functional strength training has been shown to:

Increase bone density, thereby reducing the risk of injury due to osteoporosis.

Improve coordination through the development of proprioceptive feedback mechanisms .

Develop systems of muscles rather than individual muscles, thereby reducing the risk of tears in ligaments and tendons.

Increase the strength and power to perform throughout a range of motion for a specific sport or activity.

Increase resting metabolic rate by increasing lean body mass so more calories will be burned during inactivity.

Improve use of oxygen throughout the body.

Improve appearance through overall muscle tone. (Halliwell, & M. Gutteridge, 1999)

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EFFECT OF COMPLEX TRAINING ON CD34/CD45 STEM CELLS, CERTAIN PHYSICAL VARIABLES AND JUMP SHOOT PERFORMANCE FOR FEMALE HANDBALL

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Abstract

Complex training is a valuable tool to enhance the Handball skills. The aim of this study was to determine the effect of Complex training on cd34+/cd45 stem cells, certain physical variables and jump shoot performance for female handball.

Methods

(20) Female handball players. Divided into two groups, The experimental group comprised of (10) female handball players in the age groups of 18-22 years , all participations are members of a handball team of faculty of physical education , Helwan university. The subjects in this group underwent a Complex training program comprising of various weight and Plyometric exercises for (2) months. The control group comprised of (10) female handball players at the same age for the experimental group. Parameters assessed the high, weight, power; strength, training age and Blood Sample were collected from an antecubital vein into vacuum tubes to measure the Cd34+/Cd45 Stem Cells. All subjects were free of any disorders known to affect performance, such as bone fractures, osteoporosis, diabetes and cardiovascular disease. The participants did not report use of any anti-seizure drugs, alcohol consumption, and neither smoking cigarette. And all participants were fully informed about the aims of the study, and gave their voluntary consent before participation. The measurement procedures were in agreement with the ethical human experimentation. All statistical analyses were calculated by the SPSS statistical package.

The results are reported as means and standard deviations (SD). Differences between two groups were reported as mean difference ±95% confidence intervals (meandiff ± 95%). T test for samples was used to determine the differences in the parameters between the two groups. And Pearson correlations between all variables was used, the $p<0.05$ was considered as statistically significant.The results indicated that increased significantly between the pre and post

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measures for the experimental group in accounting of cd34+/cd45 stem cells, power, strength, and composite Skillful Performances.
Conclusions.
The results indicate that two months of the Complex training program can improve physical variables, cd34+/cd45 stem cells and jump shoot performance for female handball.
*Key words***:** Complex training – Cd34+/Cd45 Stem Cells, handball.

Introduction

Strength and power are important aspects of fitness, sport and everyday activity. However, much debate remains as to how these two qualities should be assessed. Much of the debate originates from the definition of strength and power and the different terminology used across laboratories. (Sale, 1991) defined strength as the force exerted under a given set of conditions during a maximal voluntary contraction (MVC). Sale continued to define power as the rate at which mechanical work is performed under a specified set of conditions, or the product of force and velocity.
Both definitions imply that strength and power are defined by conditions such as velocity, contraction type, and posture and movement pattern specificity. That is, strength for one task may not imply strength for another. An associated problem with this is that strength and power are quite often measured in contexts dissimilar to the environment in which functional strength and power are needed. (Fatourous, et al. 2000)
Handball is an explosive sport (E. Gorostiaga, et al. 2006). During the match, handball players must be physically prepared for continuous sprints (R. Clanton & MP. Dwight, 1997). Jumps, changes of direction . (Cuesta, 1991), and explosive ball throwing (Mario, 2010).
The game includes body contact as the defenders try to prevent opponents from approaching the goal. Contact is only allowed when the defensive player frontally opposes the offensive player, that is, between the offensive player and the goal. Furthermore, because these actions must be performed over long periods, muscular endurance is also important to maintain high performance levels (Mario, 2010). Thus, handball players need to develop power to apply their skills plus muscular endurance to maintain high levels of application throughout the entire game.
Coaches and athletes have modified training method in an attempt to develop explosive power; some researchers showed that combining Plyometric with weight training could have more effect. More specifically, Complex training alternates biomechanically similar high load weight training exercises with Plyometric exercises, set for set, in the same workout.
More recently, a number of researchers and practitioners have advocated the use of complex training (CT) techniques, a term credited to Verkhoshansky. Although the term has been used to describe slightly different approaches to training, CT generally involves the execution of a resistance-training exercise using a heavy load (1–5RM) followed relatively quickly by the execution of a biomechanically similar plyometric exercise (David, et al. 2004).
Complex training protocols offer a novel exercise sequence based on the principle that exercise for the development of reactive ability can be fulfilled in a background of heightened CNS excitability, brought about by preliminary fulfillment of exercise requiring greater power.
Repeated bouts of structured bodily exertion requiring energy expenditure above resting levels result in the occurrence of multiple molecular and cellular events leading to several functional changes and providing countless health-related benefits. The disruption of the dynamic equilibrium of body homeostasis is the sine qua none of the exercise-induced adaptations at the level of the cardiovascular and neuromuscular systems.
Skeletal muscle is a dynamic tissue able to adapt to various physiological conditions. The ability of skeletal muscle to regenerate is mainly due to small mononucleated cells, called the satellite cells, located between the basal lamina and the sarcolemma of muscle fibers. Satellite cells are considered as skeletal muscle stem cells as they can reenter the cell cycle to generate differentiated cells and new undifferentiated myogenic precursor cells, allowing the renewal of their own population (Hawke, 2005).
Exercise is one of the most powerful nonpharmacological strategies, which is able to affect nearly all cells and organs in the body. In this context, a new research avenue focusing on the action of exercise on adult stem cells has emerged during the last decade. Changes in the behaviour of adult stem cells from different regions including skeletal muscle and the cardiovascular system have been shown to occur in response to exercise training. Through its action on adult stem cells, exercise may act on the regenerative potential of tissues by altering the ability to generate new stem cells and differentiated cells that are able to carry out tissue-specific functions. (Kadi, & Thornell.2000)
The aim of this study was to determine the effect of Complex training on cd34+/cd45 stem cells, certain physical variables and jump shoot performance for female handball.

Material and Methods

Experimental Approach to the Problem

Two groups (experimental and control) performed a pre and post training designed intervention in which Standing Long Jump Test (SLJ), Seated Medicine Ball Throw (SMBT) , leg strength (LS) back strength (BS) by the dynamometer , Dynamic strength test (DST) and jump shoot Performance (JSP) were recorded. The experimental group (EG) (10 female handball players) trained 1 hour per day 3 times a week on Complex training drills for eight weeks. The control group (10 female handball players) continued their normal training, while the experimental group completed a complex training program to see whether this type of training modality would have a positive or negative or no effect on (SLJ), (SMBT), (LS), (BS), (DST) , (JSP) and CD34/CD45 stem cells.

Methods.(20) Female handball players. Divided into two groups, The experimental group comprised of (10) female handball players in the age groups of 18-22 years , all participations are members of a handball team of faculty of physical education , Helwan university. The subjects in this group underwent a Complex training program comprising of various weight and Plyometric exercises for (2) months. The control group comprised of (10) female handball players at the same age for the experimental group. Parameters assessed the high, weight, power, strength, training age and Blood Sample were collected from an antecubital vein into vacuum tubes to measure the Cd34+/Cd45 Stem Cells. All subjects were free of any disorders known to affect performance, such as bone fractures, osteoporosis, diabetes and cardiovascular disease. The participants did not report use of any anti-seizure drugs, alcohol consumption, and neither smoking cigarette. And all participants were fully informed about the aims of the study, and gave their voluntary consent before participation. The measurement procedures were in agreement with the ethical human experimentation.

Training Protocol. The 8-weeks in-season training program consisted of a set of resistance exercises followed by a series of Plyometric exercises. All sets of the weights exercise with a recovery of 60 seconds/set. This is followed by a three minute rest before performing all sets of the matched Plyometric exercise with a recovery of 90 second/set. Load intensity was ranged between 50-60% .The Complex training program is described in Table 1.

Testing Procedures

Subjects were assessed before and after an 8-week training program Tests followed a general warm-up that consisted of running, calisthenics, and stretching

Static strength test (LS)(BS)

A back dynamometer was used to measure the static leg strength. The subjects stood on the dynamometer platform and crouched to the desired leg bend position, while strapped around the waist to the dynamometer. At a prescribed time they exerted a maximum force straight upward by extending their legs. They kept their backs straight, head erect and chest high. 3 trials were allowed to the subjects and the best score was taken. Subjects had a rest between the trials.

Standing Long Jump Test (SLJ):

The subject stands behind a line marked on the ground with feet slightly apart. A two foot take-off and landing are used, with the swinging of the arms and bending of the knees to provide forward drive. The subject attempts to jump as far as possible, landing on both feet without falling backwards. Three attempts are allowed.

Seated Medicine Ball Throw (SMBT):

The subject stands with their back to a wall, on a mat facing the area to which the ball is to be thrown, and with the feet extended and slightly apart. The ball is held with the hands (two hands)on the side and slightly behind the center. The ball is brought to the chest, and then thrown vigorously out as far as possible. The back should remain in contact with the wall at all times. Three attempts are allowed. The distance from the wall to where the ball lands are recorded. The measurement is recorded to the nearest 10 cm. The best result of three throws is used.

Dynamic strength test (DST)

A barbell and free weights were used to measure dynamic strength. A suitable starting weight, close to, but below the subject's estimated maximum lifting capacity was selected. If one repetition was completed, the experimenter added weight to the barbell until the subject reached his maximum capacity. Both legs were tested(Legs Push).

The weight increments have been usually 5, 2 and 1kg during the period of measurement.

Jump shoots Performance (JSP)

The subject Run slowly towards the goal and quickly jump and shoot whilst in mid-air. Continue to do this until you are confident in your timing, and accuracy of your shooting. The subject can gain an advantage in a jump shot if you wrong-foot the defender, so try and fool them into thinking you are moving in another direction, are about to pass, or about to attempt a different type of shot.

Blood Samples:

During the rest period, blood drawn by venipuncture and used the Flow cytometry for counting and examining microscopic particles, such as CD34/CD45

Statistical analysis

All statistical analyses were calculated by the SPSS statistical package. The results are reported as means and standard deviations (SD). Differences between two groups were reported as mean difference ±95% confidence intervals (meandiff ± 95%). T test for samples was used to determine the differences in the parameters between the two groups. And Pearson

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correlations between all variables was used, the $p<0.05$ was considered as statistically significant.

Results

Table 1. Complex training protocol.

Complex	Exercise	Reps	Rest/Set
Station 1	**Squats**	3 × 12RM	60 seconds
Station 2	Vertical Jumps	3 × 10	90 seconds
Station 3	**Bench Press**	3 × 12RM	60 seconds
Station 4	Medicine ball chest pass	3 × 10	90 seconds
Station 5	**Barbell Lunge**	3 × 12RM	60 seconds
Station 6	Step Jumps	3 × 10	90 seconds
Station 7	**Lat Pull down**	3 × 12RM	60 seconds
Station 8	Medicine ball overhead pass	3 × 10	90 seconds
Station 9	**Abdominal crunches**	3 × 12RM	60 seconds
Station 10	Medicine ball sit up and throw	3 × 10	90 seconds
Station 11	**Decline press**	3 × 12RM	60 seconds
Station 12	Zigzag drill	3 × 10	90 seconds

Table 2. Mean ±SD in (SLJ), (SMBT), (LS), (BS), (DST), (JSP) and CD34/CD45 stem cells for the control and experimental groups

Variables	Unit	Control			Experimental			T test between two groups
		pre	post	T test	pre	post	T test	
SLJ	Cm	199.23 ± 3.62	202.11 ± 4.07	Not Sign	200.65 ± 3.27	210.23 ± 5.32	Sign	Sign
SMBT	Meter	6.25 ± 0.37	6.62 ± 0.45	Not Sign	6.27 ± 0.14	6.96 ± 0.54	Sign	Sign
LS	Kilogram	79.26 ± 3.57	80.29 ± 3.99	Not Sign	79.21 ± 3.55	84.86 ± 4.11	Sign	Sign
BS	Kilogram	54.34 ± 3.91	56.03 ± 3.52	Not Sign	55.09 ± 3.11	59.74 ± 3.72	Sign	Sign
DST	Kilogram	83.11 ± 6.34	83.56 ± 5.61	Not Sign	81.81 ± 5.48	87.90 ± 5.55	Sign	Sign
JSP	Second	4.55± 0.21	4.89 ± 0.33	Not Sign	4.54± 0.34	5.34 ± 0.21	Sign	Sign
CD34/CD45	Count(N)	10.98± 1.17	11.11 ±1.67	Not Sign	11.07± 1.21	13.75 ± 1.62	Sign	Sign

Table 2. Shows the mean scores and differences significant on (SLJ), (SMBT), (LS), (BS), (DST), (JSP) and CD34/CD45 stem cells for the control and experimental groups. The t-test showed a significant changes between pre-and post-training scores for all variables ($P\leq 0.05$) for experimental group .however no significant differences was shown between pre-and post-training scores for all variables for control group($P\geq 0.05$) .

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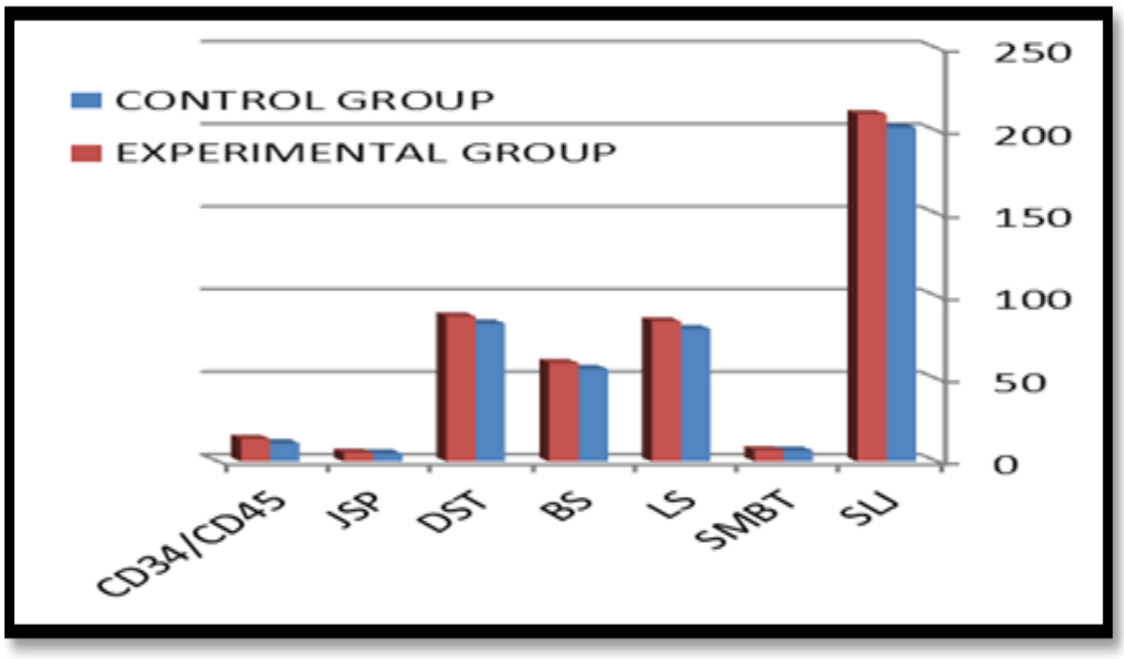

Fig 1. Explain the percentage changes for on (SLJ), (SMBT), (LS), (BS), (DST) , (JSP) and CD34/CD45 stem cells for the control and experimental groups

Discussion

The purpose of this study was to determine if Complex training s can enhance SLJ), (SMBT), (LS), (BS), (DST) (CSP) and CD34/CD45 among female handball players

The results indicate that Complex training s is capable of improving the physical - skill variables and counting of CD34/CD45 stem cells.

There are a number of potential explanations for these findings.

In the fact that Complex training s stimulates the neuromuscular system. That is, it activates both the muscular fibers and the nervous system, so that slow-twitch fibers behave like fast-twitch fibers. (D. Chu, 1998). Furthermore, resistance training increases motor neuron excitability and reflex potentiation, which may lead to better training conditions for subsequent Plyometric exercises (Ebben, & Watts, 1998); higher EMG activity was discovered in the hamstring muscles during depth jumping indicates that more fast-twitch fibres were being recruited, which in time could have provided more propulsive power.

This fact may have contributed to the increments observed in the present study.

It is postulated that the resistance exercise will have a performance enhancing effect on the Plyometric activity. (Ebben, & Blackard, 1998)

Another explanation, the muscles was involved in a very rapid switch from the eccentric phase to the concentric phase (Stretch-shortening cycle). This SSC decreases the time of the amortization phase that in turn allows for greater than normal power production. (. Hamza, 2008)

According to Rahimi, & Behpur, (2005) In the SSC the muscles undergo transition energy (from eccentric to concentric muscle action), so that to train and enhance this transition phase requires a Complex training s , such as the programs used in this study. Thereby, weight training increases muscular strength and plyometric training exploits the SSC; therefore, the strength acquired by the weight training protocols will be used in this cycle (SSC) to produce a more forceful concentric muscle action and increase anaerobic power. The results of this study showed that Complex training have a more significant effect.

A number of studies demonstrate the effectiveness of Plyometrics compared to non-exercising control groups. (J. Blakey & D. Southard 1987; O. Diallo, et al., 2001), other studies demonstrate an enhancement of motor performance associated with Plyometric training combined with Weight training or the superiority of Plyometrics, compared to other methods of training (Adams, et al., 1992; J. Vossen, et al., 2000). The evidence indicates that the combination weight training and Plyometrics are effective.

the Muscles will best respond to Complex training when utilized through their full range of motion, this is also beneficial to the handball practitioner as techniques are executed through their full range of motion and therefore the training program consider to train in this manner .

Research has found the Complex training can be beneficial to athletic performance Comyns, et al. 2007; Evans, et al. 2000).

The results of this investigation are in accordance with previous studies (Adams, et al. 1992; DSale, 1991),

showing that a combined program of weight lifting and Plyometrics can significantly increase the power and strength.

In his article Hamza, (2008) suggested that a greater muscular power may be related to a more effective and contributing to the improvement in the lung technique for young fencers.

Studies have shown increases in contraction speed when weight training was used in conjunction with sport skill practice (Dengel, et al.1987). Improved sprint performance subsequent to weight training demonstrates the application of strength to speed production . Delecluse, 1997).

Another important result of our study is the significant reduction in the CD34/CD45 stem cells secretions after the training program; these findings show the quality of the training program design.

Several mechanisms may contribute to increase of CD34/CD45 stem cells followed 8- weeks of the Complex training s program. Concerning the adaptations to strength and power training, (A. Ferrauti, et al. 2001) main factors are referred to in the literature: neural and hypertrophic. and resistance training is more likely to be associated with increases in fiber cross-sectional area.

A number of studies have shown that exercise improves the function and regeneration of the cardiovascular system and skeletal muscle by activating and mobilizing organ-resident stem cells (Crameri, et al. 2007; Petrella, et al. 2006)or by recruiting blood-circulating stem or progenitor cells (Adams, et al. 2004).

Kadi, & Thornell. (2000) suggest that physical exercise can exert powerful effects on different stem cell niches by altering their microenvironment. Currently, the mechanisms behind the maintenance of a quiescent state within each stem cell niche as well as the exact signals leading to the proliferation of stem cells following exercise are not fully understood.

Conclusions and Practical Applications

Upper and lower body explosively levels of female handball players can be improved with a combined program of Plyometrics and resistance training. These power level improvements are usually seen as essential in handball performance. The use of Complex training which contain of both resistance and Plyometric training in the same workout is an adequate strategy of training process organization, having highly positive effects on jump shhot level and CD34/CD45 stem cells.

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PREPARING OF LEARNING PORTFOLIO TO TEACH THE TECHNICAL PERFORMANCE OF THE LONG JUMP ACTIVITY FOR DEAF

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Abstract
Purpose. The preparing of program of technical learning performance of long jump came at the beginning of the research by designing learning briefcase concerning with requirements of special needs including topics and activities that can realize the equal prompting of all learners through their dependence on perceptible experiences which compensate their missing the sense. The research showed uninterested in putting special programs for this group of special needs (the deaf & dumbs) taking into consideration how to compensate them during learning in the sense of hearing whom they missed by focusing on the sense of sight using some educational devices and tools that have produced by modern technology. The research aimed to prepare a briefcase for the long jump activity to the deaf & dumbs kids, as well to be acquainted with this briefcase for learning the long jump activity.
Methods. The selection of the sample is considered as important steps and stages of the task of the search. The nature of the research controls the type of sample used. The researcher has chosen the sample of her research in a manner of intention and that of students from sixth primary class at Al-Amel Institute for the Deaf Mute for the academic year (2011-2012). The number is (13) students from the research community of (16) students.
Results. The researcher had assumed that there are differences of statistical signs and achieving long jump activity between the post and posterior the tests. The researcher had done her test for pupils of primary sixth class in Al-Amal (Hope) institute located in Basra, using the experimental program by preparing the propounded educational briefcase, Its contents have been executed by the specimen of the research as well as the test of long jump activity, post and posterior. We have got a development in the level of jump activity
Conclusions. According to the data and information reached out by the researcher , necessarily with interesting of preparing of program and educational briefcases of different activity and games foraging groups in need of interesting of special needs groups
Key words: portfolio, long jump, deaf.

Introduction

The contemporary educational trends confirms to build a new education system based on the involvement of the student with the teacher at all stages of the educational process and leave the familiar, the teacher is to be the only axis of the educational process to teach the curriculum, he is responsible for sending the information most of the time and the student's duty is to listen and imitate what the teacher says. This is confirmed by many of the methods of traditional teaching ((the centre of the educational process must be the transferred to the student and the role of the teacher is a guide of learning, he designs interesting and exciting learning situations and manages the class intelligently, asks questions , manages discussions and uses new technologies that contribute to building an education system that takes into account the advantage of the technology of education keeping its suitability for his students concerning their mental, emotional, psychological, physical and dynamic growing) (Najah, 1986). (The self-learning is one of the modern methods that gives the role to the student side aside with the teacher whose role is to facilitates learning and to achieve the goal of the lesson. In this way he will come into an active and vital learning, and it will transfer the center of the educational process for the student himself to discover his self-aptitudes and capabilities to plan for developing directing it according to his private tendency in line with his needs and self-growth ability) (www.wahat.com/htm (2002), and to stimulate his personal motives and desires to be able to reach the maximum energies and potential of his own. The educational bags are one of the types of self-education and of the best educational techniques that rely on the introduction of learning during the class and to help in organizing the vocabularies within groups containing all what are needed by the student since they provide him applicable activities and tasks, modern techniques, tests and means assessment to give him a chance to learn according to the their possibility of learning.

If the planners of the educational process (curriculum) could employ this kind of learning to

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teach the curriculum for children with special needs, including deaf and dumb children, we might diminish some of the difficulties facing them compared with a normal child due to the loss of speech as well as the sense of hearing. (F. Mustafa , 1993).have pointed out that the information learned by the human eye forms (75%), while the acquired information gained through the sense of hearing constitutes (13%) only ".

The scholars differed concerning the appropriate age for teaching them how to speak and then they join the ranks of education. Many of them point that "it is possible to start with them at the stage of kindergartens", that is, at the age which is equal to the age of the average child, to allow them the opportunity to attend special classes as they begin to learn speaking and to study curriculum designed for them. The above is clear that although this child is unable to listen to the teacher and talk with those around him, in spite of that, it does not make us lose hope in his teaching, because the deaf child has the mechanism of speech what the normal child has. He lacks the sense of hearing only dominated by two types of special language for the deaf (sign language and the language of the lips) that facilitate it to deal with them and deliver the information after he gets the point through which we can say he begins to control the language by reading lips in addition to the control of the written operations which must go hand in hand with the process of verbal expression (Mukhtar, 1975). This group needs special care and if we want to teach them we must put special programs according to them and agree with their abilities because they have a right towards us as a normal child has according to the principle of equal opportunities for all children.

Sports Education has sought, as one of the branches of education which enters the curriculum for these children, to take care of continuous renewal and the evolution of the curriculum of physical education to ensure they're prepared physically, skillfully, health, social and psychological with the assistance of modern technology. In order to ensure the program's success, researchers have chosen the activity of the long jump which is of the natural movements of which is practiced at general level where it enjoys the fourth place in terms of the natural progression of movements of children that begin with crawl, walk, run then jump (Qasim, 1999).

The significance of the study hides in preparing of educational program to teach the technical performance of the activity of the long jump and the development through the design of educational bag taking into account the privacy of learners and their abilities, and to include it topics and activities that can achieve the equivalent advancement for all learners containing optical feedback using the video, booklet, photos, serial, CD and displaying drives at normal speed or slow. Thus they will learn by adopting the sensory experiences that make up their missing sense where the program relies on the vivid images embodied by the video and brochure that meets the desires and needs and increases their self-confidence as a result of security and not to be afraid of mistakes and a sense of inferiority and helplessness.

It is difficult for ordinary people to know what a deaf means, they spend time imagining how could a man be a deaf ? Deafness seems to those who rely on their hearing as something strange, and the word cannot be believed or imagined, and as a sense of voice regulates the lives of listeners in terms of communication and networking, it leads them to believe that deaf people living in a world of emptiness. Such a belief would close many doors in their lives. This situation cannot be avoided, so negative complications reflect on the life of the deaf themselves; and looking at the deaf through their lack, make them suffer from the way they are treated more than suffering from the deafness.

Deafness may represent a real disability but deaf suffer from our closed minds more than they suffer from their closed ears, and this is the cause of serious attention with deaf. Before identifying the facts of their lives, we should know first the damage caused to them and what are the damages which they suffer today, that is, the difficulty of hearing, this means a hearing disability permanently or intermittently and significantly affects academic and educational achievement, but it is not included within the field of deafness(Farok , 2002).

We all know that the process of language acquisition is the process depends on the child's ability to imitate. Firstly he mimics himself (self-imitation), that is, in the stage of (almunaghat), after that, the stage of outer imitation, that is, he imitates his mother or mother substitute. Without limitation, the child is deprived of an important means of being able to acquire the language. When a child releases a voice of (DA), for example, a voice issued automatically at first, he feels with some pleasure that motivates him to repeat this sound, and this makes the child hears his voice and delight of this process and this drives him to attempt to repeat (da - da). The new situation becomes of this type of reaction as a circular ring including the hearing and speaking and in the same way other similar forms to be formed as conditional and circular structures. (Mustafa, 1993).

The ancient philosophy in education confirmed that the teacher was the one who performed all educational activities, and he the only leader while the modern philosophies emphasizes the positive role of the learner, because he is the center of the educational process, therefore, new patterns of learning have emerged, affected by the scientific and technological development in the field of education in order to raise efficiency of the educational process by the best investing of modern technology and employ it in a way that fits the need. The bag of education is one of these applications that have proven its efficiency in

various fields providing the learner more than means to learn as well as the teacher. This course will contribute to the progress of the learning process. Through the follow-up of researchers to the studies and through their experience in the field of teaching methods and Racetrack, they have found a clear shortage in the use of modern technology represented by the educational bag, but it is through our knowledge on the existing curriculum in the schools of the deaf dumb and all levels of education including the curriculum of physical education * we have found that there is weakness caused by lack of interest to set up special programs for this group taking into account the compensation of hearing sense that they have lost and focus on the visual sense through learning to enter some of the provided technology for the education such as sets and instruments allow the students to set their imagination. The objectives of teaching should not be restricted to gain the knowledge only, but also to include guiding the students to use potential using thinking skills and learning processes and autonomy by assist of modern educational techniques because it will provide the ability to attract the attention of students for a long time, and to comprehend understand the information through the living image, so they will acquire new experiences that work on the reorganize of previous experience, which is the basis for understanding of subjects, and not only explain cognitive aspects and the collection of information, and then performance in the school yard without taking into account the aspects of skill or emotional or individual differences among them, which the researcher has regarded as a problem that is worthy to study through a design of educational bag containing several materials (notebook dump, pictures, videos and CD) to view and provide information for the education of deaf mute children the long jump activity and to develop some physical attributes.

The research aimed to prepare a briefcase for the long jump activity to the deafs & dumbs kids , as well to be acquainted with this briefcase for learning the long jump activity.

Methods

The selection of the sample is considered as important steps and stages of the task of the search. The nature of the research controls the type of sample used. The researcher has chosen the sample of her research in a manner of intention and that of students from sixth primary class at Al-Amel Institute for the Deaf Mute for the academic year (2011-2012). The number is (13) students from the research community of (16) students.

Thus, the percentage of the sample is (81.25), and the arithmetic mean of age (12.38). In order to ensure homogeneity of the sample in the (age, height, weight), we have used the coefficient of variation where the results show in Table (1) that there is no significant difference between the sample as it becomes clear that the value of the coefficient of variation for the varying age (4.03) and variable length (6.61) and the variable weight (15.41). The value of the coefficient of variation calculated is less than 30% (Wadea, 1999).

Educational bag

Educational bag is "a set of training experiences designed by specialists in a systematic, organized, coordinated method; it includes materials, activities, learning and training experiences related to a particular subject, and includes the essential elements of education which are (goals, activities, training materials and expertise, Calendar".

Field experience

The management of the test distance of achievement before and after the implement of teaching bag items is under discussion. I have done pre-tests on Wednesday 21/3 in the Stadium of Basra sport Club for track and field at 10.00 am.

Teaching programme

Before putting the curriculum of the educational bag, we have analysed the content of many books and sources that deal with the long jump activity in order to identify the parts and the key stages of artistic performance (technique) for this activity. We refer to the experts and specialists of track and field and the methods of teaching physical education. I have offered them (CD) that contains the players such as U.S. (Johnny Johnson) winning the first place in the world championships and the other the Iraqi winning the first place (Karim Tarek) for the championship of Iraq's universities. The researcher explains the technical stages of the long jump activity. She has also cut the images from disks and turned them into fast and slow. She has adopted this division in the preparation of the educational program in accordance with the teaching bag. The educational program includes technical performance of the long jump activity and technically included special exercises for the stages of the activity. The teaching unit has been divided into three divisions.Preparatory Department and its duration (22 minutes) is divided as foll

- Register of attendance (2 minutes) - Showing discs (CD) in the allocated room and the distribution of the booklet and photos (10 minutes). - Special and general preparatory Physical exercises (10 minutes).The main section and duration (18 minutes) including:
- The educational activity (3 minutes). - Applied activity (15 minutes) 3. Final section and duration (5 minutes) including small toys. The educational program includes (20) educational units continuing for(10 weeks) for the period from 10/10/2011 till 25/12/2011 at the rate of two units per week at a rate (45 minutes) per unit. The research has been initiated.

Design of the teaching Bag

Through access to studies and research on the preparation of education, the bag and educational use in teaching and dependence on the method of self-education and the availability of educational materials

and programs are designed according to approach a particular learner can choose what suits his tastes and abilities and raises motivation towards learning effectively to facilitate the learning process n through the design of the learning environment and activities in that environment and those programs that have spread use in the educational field suitcase and is designed in the light of instructional design and the steps that have been directed by the bag and as educational as the final steps we have developed components(Fawzi, 1980).

Choose a subject mode:eaching effectiveness of the long jump for the deaf and dumb children of ages (12-13 years) for being the effectiveness of the new have never performed or even identify them (Abdel Bari, 1988)

Identify the characteristics and needs of learners:

That all members of the research sample are students from the sixth stage in the Hope Institute for the Deaf dumb and have never participated in such a special program for handbag educational as well as they are of an age group and we tried to determine the characteristics of the learners through the numbers of educational material and analytical content of the books and sources that addressed the effectiveness of the long jump (Mohamed,1999).

The number of scientific material and content analysis:

After analyzing the content of the books and sources that addressed the effectiveness of the long jump, including (KH. Resan and M. Abdul Rahman, 2002) (H. Qasim,, 1999) (R. Kamal, 2005) (O. Mohammed, 1990). Prepared the content of scientific material of the bag, which included learning the stages (approach and sprint sprint. Foot landing) and in units of the bag and educational illustrations for each part of the event.

Write the introduction:

In this step shows the importance of the content of the bag for students through the key ideas and information contained therein and the importance of every idea and work to raise the attention of the student on the topics and materials to be covered and activities to be undertaken as it is in the introduction to explain the relationship between the bag material other study that facilitate student learning is also provided should contain the overall objective of the bag which is designed for it (Noor, 1996).

Guidance and instructions:

It is a set of instructions and guidance to the student explains how to use the bag and alternatives and the various activities and instructions for the program.

The formulation of goals, behavioral and education:

Should then write the introduction and guidance to formulate goals, behavioral, that are written in the form of statements accurately describe what the students do and the educational goals that will lead him to perform effectively correctly, has been prepared in T modules and arranged scientific material in modules small to be a sequential study of each unit in a class, and employed in various teaching aids available to meet the goal that the student will be learning on the basis of that part of the effective parts (long jump), these activities have been divided into:

- Activities are mandatory:

Includes reading information written on the bag on the technical performance (technique) is usually prepared by the designer bag of books and resources and look at the illustrations in question in the bag and the Appendix.

- Activities are optional:

Possible trend toward the student view (CD) or to see what books or a drawing of this part of the event brochure or to deepen his understanding of the dynamic behaviour (technique).

- Activities An Empirical

These activities are designed to encourage a student to deal with the content of the activities of reference and then achieve the behavioural objectives of the case. (G. Ibrahim , 1992)

The selection of alternatives and educational activitie

This step is of major steps in the preparation of the bag educational and construction because the availability of many educational alternatives in front of learners and levels of different difficulty will take into account the individual themselves and commensurate with their speed of learning, all directed activity of the learner to help him in achieving the educational goals established, and in light of the above chose us a number of alternatives and activities Education through.

(See the Arabic sources Included the effectiveness of the long jump and take advantage of the experience and competence and access to teaching aids available in the Faculty of Physical Education at the University of Basra, and then we started to design and build a bag, use, and about which there is content on the education of the effectiveness of the long jump. That the diversity of activities and alternatives learning allows the learner complete freedom to choose what is suitable and appropriate for his abilities and inclinations based the principle of individual differences, which is one of the principles on which a reliable teaching bags educational as well that this kind dispels boredom and increases in the thrill of a substance of learning. We have used alternatives to the following in the bag:

The alternative I: printed material: print media is one of the most important tools and equipment educational all, if what has been used effectively (A. Saad, 1992). And allows the learner the opportunity to bring it back more than once to stop and take notes, and verification of the ideas in the lesson and the exposure accurately to clarify some of the illustrations also provide a wider base of information and take into account individual differences among learners. And printed material for the book to be formed to explain the parts of the

effectiveness of the long jump according to content analysis of scientific material in the modules and the framework for sequential and organized according to the sequence of scientific material, also contained this alternative set of instructions to facilitate the learning process, as well as on (objective behavioral motor - printed scientific material - illustrations - the duties and activities and the organizational and practical tasks - the self-test for each unit).

The second alternative: - image sequence (securitization). This is a variant of the easiest alternatives to use and less expensive as it provides the learner perception is clear of the movement, and how the movement of different body parts during the performance art of the movement that has on the effectiveness of the long jump for the world champion U.S. and also the researcher has filmed universities in the country championship which was held in Basra and recorded on a CD and then cut through the computer to the sequential images of the sprint to the approximate landing stages.

The third alternative: DVD CD. A CD is characterized by connection of education and its association with a special way from beginning to end, put the disk in the device driver CD and features to offer high-tech where you can turn off the picture and keeping it before any part of the procedure's effectiveness and also view the film quickly or slowly and can remodeling film or any section of the county several times and all it helps to understand the dynamic performance.

Guide teaching package:

For the purpose of completing the bag educational and facilitate the task of the learner to reach the objectives of the lesson self-designed guide teaching package, which included a general idea of what to do when you use the bag and also includes instructions and recommendations and guidelines that should be on the learner to follow in his study using the teaching package as well as for providing students with the idea of general activities and alternatives in the bag has been arranged according to sequence content of Article.

post-test (final)

We conducted a posteriori tests. The sample on the day on Monday, 26/12/2011 and keen to find the same conditions and requirements of the experiment Allasttalaih in terms of time and place and the means used.

Results

Table (1) he value of the arithmetic mean, standard deviation and the value of (t) calculated and tabular test results to accomplish the long jump in pre and posttests.

Pre		Post		Accounted value	Result
S	A	S	A	6,19	Moral
245	46,3	316	35,3		

* Value (v) the degree of freedom under the spreadsheet (12) and the level of moral T. (0.05) is equal to (2.18)

Table (1) Shows that there are differences between the averages and standard deviations of the values of test results done the long jump, as was the arithmetic mean of the test tribal (245) cm and standard deviation (46.3 cm) while the arithmetic mean of the test dimensional (316) cm and standard deviation (35.3 cm) For the purpose of testing the hypothesis on the terms of the differences between the circles calculations treated the results statistically by t-test, as it became clear that the value of (t) calculated amounted to (6.19) is greater than (C) indexed under the degree of freedom (12) and the level of significant (0.05), amounting to (2.18) and this means that there is significant difference in favor of the post test.

From the foregoing we see that the evolution in the level of completion of the research sample was the result of the developments that have taken place in the key variables affecting the level digital event as it is the body of sports in this case an object projectile at an angle with the horizontal line and influenced accordingly, all the factors affecting the arc aviation and space achievement.

In addition, the construction motor right as a result of what has happened in the research sample of doses of an educational training program has contributed to a favorable situation for the start of the player during the promotion, which is achieved through the tide full of men rising and vertical position of the trunk with the activation of both the movement of arms, harmonic and weighted man free through the promotion and look forward in this regard should be drawn to the hand of great importance is the survival of focusing on the imaginary point above the line of sight horizontal during the flight because the focus to look at the bottom of the lead to land early as the head is the one who leads the body and this leads to make the center of gravity of the body in a position suitable for starting and then increase the difference vertical between points of departure and landing Recalling (Talha, 1993), that in the case of a tie both the speed and angle of departure, the body emanating from the increase of the highest achieving distance horizontal Akbar "(Qais, 1989).

Also attribute the reason for this is to bag educational as it prepares students to different areas of experience visual and sensual, with the learner to gain experience teaching diverse through interaction and participation, practice and contact data of the environment through the diversity of sources of knowledge that are appropriate to the needs and inclinations and abilities as the availability of alternatives in the bag provides the learner feed feedback and evaluate them on an

ongoing basis and its effective participation in the education process it all leads to be proficient in the student learner conduct educational mission as a whole as well as this, the participation of the learner in the learning process is essential to attract his attention and to bring about the behavior of reinforced and a shift to practice real "in bag of educational activities and teaching aids that integrates the learner and the right to share in the learning process "(Qais, 1989). and teaching package provided a positive impact in the education and the improvement and development phase of flight in the research sample, using the easiest way to learn, as indicated by the sources, but a method step (A.Samir,1981) and add to that that master the operation of aviation during the long jump contribute to maintain the flight path of center of gravity of the body and prepare for the economic downturn as a player during the latter part of the stage of flight to lift the legs forward to the highest level possible, with the weighted arm front and look for the farthest distance and head up to the top to continue in the flight for greater distance, as the descent of the legs leads to a landing early reduces the distance achievement, and thus contributed to group aids in the teaching package proposed to achieve this through the development of some of the barriers the foam in the performance to work incentive urges students to raise the feet during the phase of flight .

Conclusions

Depending on the results of research and statistical analysis of data was reached the following conclusions:

-

1 - There are significant differences in the level of achievement of the long jump with the sample between the pre and post tests and in the post.

Recommendations

The start of what was possible to discuss the results deduced from the data the researcher put the following recommendations:

1 - attention to the preparation of programs for various activities and games for children with special needs.

2 - Conducting similar studies for the rest of the activities of track and field games.

3 - Diversification of the educational alternatives for the purpose of thrill.

4 - Adoption of modern technologies in teaching and learning of their importance in improving the level of achievement and the development and diversification of sources of education and made available to account for individual differences among students.

5 - The adoption of forms of self-education to learn the various activities and sports skills. The transmission axes of the educational process of the axis of the teacher to the axis of the learner are important in the integration of the learner and the learning process and its ability to develop differently.

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STUDY ABOUT THE REACTION TIME RELATION TO SPORTS PERFORMANCE IN KARATE DO

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Abstract

In karate do, the primordial motor quality is represented by speed, under all its manifestation forms. Among them, we shall approach the reaction time, because it is particularly important to athletes and its decrease by a few tenths or one hundredth of second may condition the achievement of a very good sports result. In order to efficientize the competitive results and to better manage the athletes' training, all these aspects should be taken into account.

Purpose. This paper represents a starting point for an ampler study related to the way in which the reaction time may become a prediction factor for the karate do athletes' competitive performances. It also proposes some individualized intervention strategies meant to improve the reaction time, with the final goal of increasing each athlete's performance level.

Methods. In order to develop our research, we used the case study method, the observation method and the graphical representation method. They consisted of administering the Reaction Time (RT) Test, included in the PSISELTEVA computerized battery created by RQ-Plus, to top performance senior athletes from the "Rapid" Sports Club of Bucharest, components of the WKC (World Karate Confluence) National Karate Squad. Testing was performed within the UNEFS Psycho-Pedagogy Lab.

Conclusions. Tests provide an important database that can be subsequently used to make a correlation between the test results, the top performance athletes' training and their competitive results.

Key-words: karate do, Goju-ryu, reaction time, sports performance.

Introduction

Sports performance is a bio-psycho-social value achieved within some official competitions, as a result of a multiply determined capacity assessed according to some rigorously established criteria or standards. Performance depends on the task-activity-result relationship.

Capacity is a multifactorial resultant determined by aptitudes, by the personality maturation degree, by learning and exercise: it can be educated, developed through exercise, or "atrophied" through demobilization, which occurs more often than the physiological function diminution due to the aging process.

Teodorescu (2009), by quoting Dragnea (1996), asserts that performance capacity results from the operational interaction of some bio-psycho-educogene systems and is concretized in recognized values that are classified according to some socio-historical criteria. It represents the complex manifestation of the individual's availabilities, being materialized in objective values or in values expressed through points, scored goals, lifted kilograms, ranks, classifications, earned rights etc.

The performance capacity structure is conditioned by two groups of determining factors:

internal factors – aptitudes, attitudes, characteristics of the functional activity and of the body structure;

external factors – ambiance, including in its structure both training and competition, as a special socio-educational environment, the general socio-educational environment and the natural environment, physical and climatic factors.

Aptitudes result from the interaction of the hereditary predispositions, the educative conditions for their development and the subject's activity. When aptitudes reach a higher development level, we speak about talent.

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Attitudes represent a person's conception and philosophy of life, his preference for certain activities, which is determined by inner convictions or by external influences that characterize his personality. The types of attitudes specific to sports field are the cognitive, affective and conative ones.
Ambiance represents the environment in which the individual lives his life and which requires him to cope with.

Sports training is a complex long-term process that has for goal to maximally develop the athlete's performance capacity and personality (Epuran, 1990: 35-58).

Frédéric (1993: 7) considers that martial arts are a universe in itself, a captivating one, which couldn't be discovered in its whole complexity not even if man had been given to live many lives one after another!

Karate represents a system of fighting without weapons, performed at top level as a competitive sport, its practitioners being specialized in kicking and striking techniques, blocking techniques and defensive movements (Enoeda & Mack 1975: 4).

Karate is "a school of life and its principles, when transferred to physical and mental practices, help us gradually improve our spirit and expand our knowledge, by enriching our personality!" (Deliu, 2008: 121). At the same time, Kancho Kanazawa states that, although karate is a combat sport, the spiritual attitude is extremely important.

Goju-ryu is one of the four major styles composing the karate do branch, together with shotokan, wado ryu and shito ryu. The style name comes from the words "GO" = hard, "JU" = soft and "RYU" = style. This sports branch has continuously evolved due to the creative efforts of many masters, each one improving it according to his psycho-somatic specificity and to his social experience accumulated throughout the years (Mageriu, 1991: 20, 21).

Karate is a dynamic and acyclic sport that opposes unpredictable and combative athletes. It is extremely complex, because all the body functions are involved in, it is very stressful due to the acute time pressure specific to each competitive fighting (the last 30 seconds) and to the speed imposed by all the fighting actions, it is spectacular, heuristic etc.

Epuran (2001) by quoting Chappuis, presents a classification of sports based on the energetic expenditure and the nervous concentration criteria, according to which karate do is a combat sport that requires a high energetic expenditure and nervous concentration to win the supremacy.

In the combat styles, speed represents a primordial motor quality, if we refer to the fighting dynamism and unpredictable character, but also to the time pressure that characterizes any karate do fighting style.

In Goju-riu, speed has also priority over the other motor qualities, because this style places a strong emphasis on the very quick execution of the kicking and striking techniques, on the soft or hard defenses and on the sudden counter-attacks. In the fighting situation specific to Goju-ryu, the athlete who attacks faster and more unexpectedly than his opponent has the best chance to score a point (ippon).

According to the above-mentioned aspects, the motor quality indispensable to karate do is speed, under all its manifestation forms (execution speed, movement speed, repetition speed and reaction time). Among them, we shall approach the reaction time, because it is particularly important to the practitioners of any branch and even more important to the karate do athletes, because all the technical-tactical actions are performed at maximal speed, in order to accumulate the points necessary to win the victory, sometimes even before the statutory time expiration (2 minutes for women and 3 minutes for men, in senior class). The reaction time decrease often makes the difference between a world champion and a simple participant in a world championship. In order to efficientize the competitive results and to better manage the athletes' training, we should take into account all these aspects.

The reaction time in karate do

The motor reaction latency time represents the time interval between the subject's motor response and its stimulation (Deliu, 2008: 49).

The reaction time improves along with the athlete's brain maturation, according to an ascendant dynamics, starting from the age of 6-8 years old, and it reaches maximal values at the age of 20-30 years old, then it slowly decreases until the age of 65-70 years old (Manno, quoted by Dragnea, 1996), with 5 ms every 5 years, and significantly decreases after this age (Grouios, 1991, quoted by Deliu, 2001). The latter author also specifies that, at the age of 20, women have a latency that exceeds with about 50 ms men's latency.

The prerequisites for a quick reaction in Goju-ryu are represented by: a very good visual, acoustic, tactile and kinesthetic acuity, an optimal condition of the excitation, inhibition and cortical processes involved in the motor response, an appropriate psychic background, an optimal physical fitness, optimism and confidence in one's personal fighting capacities.

Athletes' reactions to different signals can be simple or complex.

Simple reaction is a concrete response to a familiar but unexpected stimulus (for instance, a flash, a very loud noise). This type of reaction is extremely important in sports and in daily life. The necessary time to respond to a stimulus may take many hundreds of milliseconds. "The development of the simple reaction speed is particularly important to athletes, because its decrease, even by a few tenth and one hundredth of second, may condition the achievement of a good result" (Dragnea, 1996).

Complex reaction is generated by two typical situations: the reaction to the moving

objects/body/body segments and the choice reaction. The former case can be exemplified by the reaction of a karate athlete who must evaluate and react to the opponent's kick (Deliu, 2001:64). In the latter case, the fighter must pick, from a multitude of responses, that which corresponds to his opponent's behavior. The latency time to such stimuli increases proportionally to the number of alternative responses and this relation is reflected by a supplementary cortical processing that requires the athlete to select the optimal program, appropriate to the concrete situation, and to put it into practice.

In top performance athletes, especially in karate do fighters, the choice reaction is so quick that it gets close, from the latency time point of view, to the simple reaction.

In karate do, the entropy should be as low as possible, almost close to zero, such in the case of the simple reaction (for one's own athletes), while for the opponents, the entropy should be as high as possible, so that their reactions are delayed or even tardive.

The reaction time to the complex stimuli of the competitive fighting decreases in the karate do athletes concomitantly with the increase of their motor experience through specific training sessions, in inverse ratio to their specific technical-tactical improvement (Deliu, 2001).

Purpose of the research

This paper represents a starting point for an ampler study related to the way in which the reaction time may become a prediction factor for the karate do athletes' competitive performances. It also proposes some individualized intervention strategies meant to improve the reaction time, with the final goal of increasing each athlete's performance level.

Methods

In order to develop our research, we used the case study method, the observation method and the graphical representation method.

The subjects of our research are top performance senior athletes from the "Rapid" Sports Club of Bucharest, components of the WKC (World Karate Confederation) RKF National Karate Squad.

The competitive activity considered by us for the development of this study refers to the national contests that took place in 2012, namely:

- Transylvania Cup;
- National Championship;
- Dojokan Cup;
- Unirea Cup;
- European Champions Cup;
- Romanian Cup;
- Ippon Cup.

On the international level, the competitive calendar included the following contests:

- Five Nations Tournament, developed on five stages (Belgium, Ukraine, England, Romania, Italy);
- Italy's International Competitions (Italy);
- 3 Borders Championship (Belgium);
- International Shikon Cup (England);
- European Senior Championship (Scotland, Glasgow);
- World Club Championship (Italy).

We shall approach in our study only the top level competitions, where the participants are considered to be have reached their peak sports shape, namely the National Championship and the European Senior Championship.

In our research, we administered the Reaction Time (RT) Test included in the PSISELTEVA computerized battery created by RQ-Plus.

Testing was performed within the UNEFS Psycho-Pedagogy Lab, under the supervision of Assistant Lecturer Radu Predoiu, Doctor of Psychology.

The RT Test is conceived as a dynamic pattern made up of 50 sequences. It consists in the emission of pre-established responses to a generated signal-stimulus and takes place within an imposed time frame. In the test construction, we had in view to create problem situations through:
a variable rhythm of the signal-stimuli generation;
a limited time frame for the signal-stimuli generation.

The test involves the following aspects:

- prompt reactions;
- constant attention;
- optimal dosage of the inhibitor process.

From the diagnosis perspective, this paper aimed at measuring the simple reaction time. The test has many parameters that pursue the following aspects:

- number of correct responses;
- number of anticipated responses;
- number of delayed responses; omissions; error rate = (anticipated responses + delayed responses + omissions) / 50; reaction time mean (rtm_mean);
- mean standard deviation (std_dev).

The final testing phase is assessed through a series of coefficients, namely:

- reaction time mean (rtm_mean);
- coefficient of performance (Cperform).

The psychomotor information offers two components: simple reaction time; test performance.

The table 1 presents our athletes' results in the National Championship held in Bucharest (from 21 to 22 April 2012) and in the European Senior Championship held in Glasgow, Scotland (from 29

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May to 3 June 2012). The athletes tested by us are aged between 18 and 25 years old. Therefore, two of them are juniors, because juniorship includes the age category from 18 to 21 years old, that is why they couldn't participate in the European Senior Championship, seniorship including athletes above 21 years old.

According to table 1, the subjects of our research are elite athletes, with remarkable results in the big competitions.

Table 1. Sports results 2012

Crt. no.	Surname and name	National Championship	European Senior Championship
1.	A.G.	1st place	No participation
2.	B.D.C.	3rd place	No participation
3.	B.F.	1st place	1st place
4.	I.V.R.	1st place	1st place
5.	L.E.A.	1st place	1st place
6.	L.I.S.	1st place	1st place
7.	S.D.M.	1st place	3rd place

The reaction time test is represented in table 2. The resulted data are directly interpreted by the PSISELTEVA battery software.

The number of stimuli represents 50 sequences of responses to some generated signal-stimuli, within an imposed time frame.

The simple reaction time mean (ss) represents one of the test parameters and, as we can see in table 2, our athletes' reaction time mean is comprised between 15 and 20 ss.

The same table shows us that all the athletes emitted correct responses to the 50 signal-stimuli, which can be correlated to the competitive fighting in karate do as follows: during a competitive match, all the opponent's attacks will be blocked by our athletes or all the attacks initiated by our athletes will be successful.

Table 2. Reaction Time Test

Crt. no.	**Surname and name**	**Number of stimuli**	**Simple RT mean (ss)**	**Correct responses**	**Corresponding class**	**Coefficient of simple RT**	**Coefficient of performance**
1.	A.G.	50	15	50	3	0.178	5.618
2.	B.F.	50	15	50	5	0.153	6.553
3.	B.D.C.	50	16	50	3	0.164	5.116
4.	I.V.R.	50	19	50	3	0.188	5.319
5.	L.E.A.	50	16	50	4	0.160	6.258
6.	L.I.S.	50	15	50	4	0.148	6.360
7.	S.D.M.	50	20	50	2	0.203	4.916

The coefficient of simple RT and the coefficient of performance obtained by the tested athletes positioned them in classes corresponding to levels from 1 to 5, where 1 represents the poorest class and 5 represents the best class. The table 2 shows us that one of the athletes (S.D.M.) is positioned in the lowest class (2), which is also reflected by his international competitive activity: in the 2012 European Championship, he was ranked 3rd, as compared to his teammates who were gold medalists within the same competition.

Three athletes (A.G., B.D.C. and I.V.R.) are positioned in class 3 (mean level), two of them being juniors, respectively the age category comprised between 18 and 21 years old, which indicates a performance potential that can be maintained and, in optimal conditions, improved in the course of time, which would help them achieve very good results in the big senior competitions (above 21 years old). As to the third athlete belonging to class 3 (I.V.R.), we can notice that he was ranked 1st in the European Championship, so we can consider that, at the test administration, he wasn't in his best sports shape, which was however reached by him in the European Championship.

Other data provided by table 2 indicate that three athletes (B.F., L.E.A. and L.I.S.) are positioned in superior classes, respectively 4 (good level) and 5 (very good level), which means that they are the most

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valuable athletes of our sample, with a rich competitive experience and excellent competitive results. Their very good results in the Reaction Time Test and their promotion to higher classes are also positively reflected by their competitive activity: they are elite athletes with outstanding results on the national and international levels, being ranked 1st in the big competitions of the year 2012, respectively the National Championship and the European Championship.

From the graphical interpretation of the reaction time results, we can see that three athletes (L.I.S., B.F. and L.E.A.) obtained the best times in this testing, which positioned them in superior classes, namely 4, respectively 5. They are the most skilled athletes of our sample, who have been practicing karate do for more than 15 years, and they have excellent results in the national and international competitions, which can be noticed in table 1 that presents their competitive results in 2012, when they were ranked 1st in the National Championship and the European Championship.

At the same time, in the graphical interpretation we can see that the two junior athletes (A.G. and B.D.C.) are positioned in class 3, which indicates their mean level. In senior class, the competition is more strenuous by far and top performances are much more difficult to reach due to the sports elite at this level and to the extremely high competitive level, but the athletes' positioning in class 3 gives us the hope that, by knowing these results and by implementing an appropriate scientific management in their sports training, they will be able to improve their performances and, consequently, this will have a positive influence on their future activity, as senior athletes.

The third athlete positioned in class 3 (I.V.R.), who passed from junior to senior class about one year ago, is a gifted and very ambitious athlete, with competitive results that ranked him 1st in both the National Championship and the European Championship.

The graphical interpretation shows us that one of our athletes (S.D.M.) is positioned in a less valuable class, respectively 2, from the perspective of his reaction time, and in class 3, if we take into account his coefficient of performance. This positioning is also reflected by his competitive activity: in the European Championship he was ranked 3rd, as compared to his teammates who achieved more valuable results, but we shouldn't ignore that this athlete has recently been promoted to senior class. We think that, through a rigorous scientific training, his results can be improved.

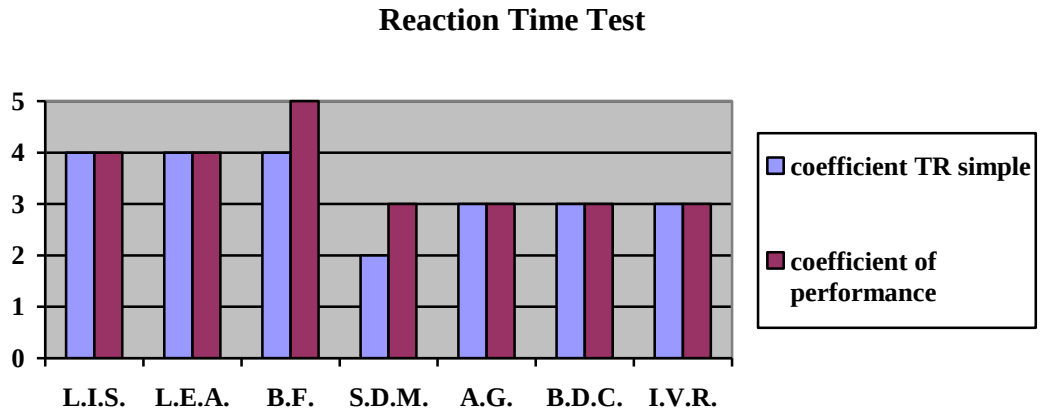

Figure 1. Graphical interpretation of the reaction time

Discussions

According to the previously mentioned aspects, the primordial motor quality in karate do is represented by speed, under all its manifestation forms. We approached the reaction time because it is particularly important to the practitioners of any branch and even more important to the karate do athletes, where everything is performed at maximal speed. The reaction time decrease by a few tenths or one hundredth of second may both condition the achievement of a very good sports result and insure the points necessary to win the victory, even before the statutory time expiration (2 minutes for women and 3 minutes for men, in senior class). In order to efficientize the competitive results and to better manage the athletes' training, all these aspects should be taken into account.

Many foreign authors and romanians as well had performed studies regarding the reaction time and revealing important aspects such as: the reaction time improves along with the athlete's brain maturation, according to an ascendant dynamics, starting from the age of 6-8 years old, and it reaches maximal values at the age of 20-30 years old, then it slowly decreases until the age of 65-70 years old (Manno, quoted by Dragnea, 1996), with 5 ms every 5 years, and significantly decreases after this age (Grouios, 1991, quoted by Deliu, 2001).

We tried to highlight the practical aspects of reaction time on high-performance karate do athletes, and we consider that the prerequisites for a quick reaction in Goju-ryu style, are represented by: a very good visual, acoustic, tactile and kinesthetic acuity, an optimal condition of the excitation, inhibition and cortical processes involved in the motor response, an appropriate psychic background, an optimal physical fitness, optimism and confidence in one's personal fighting capacities.

In karate do, the entropy should be as low as possible, almost close to zero, such in the case of the simple reaction (for one's own athletes), while for the opponents, the entropy should be as high as possible, so that their reactions are delayed or even tardive.

Following the statistical data processing and interpretation, we can notice that the most valuable athletes of our sample, with a rich competitive activity and outstanding results in the big competitions, obtained the best times, which positioned them in superior classes, respectively 4 and 5. Athletes who have recently been promoted to senior class, where the competition is strenuous by far and top performances are much more difficult to reach due to the sports elite at this level, achieved poorer results, being positioned in a mean value class, respectively 3.

The administered test has provided us an important database that can be subsequently used to make a correlation between the test results, the top performance athletes' training and their competitive results.

Conclusions

1. We found out that tests provide an important database that can be subsequently used to make a correlation between the test results, the top performance athletes' training and their competitive results.

2. We can notice that the most valuable athletes of our sample, with a rich competitive activity and excellent competitive results in the big contests, obtained the best times, which positioned them in class 5.

3. The primordial motor quality in karate do is represented by speed, under all its manifestation forms.

4. In top performance athletes, especially in karate do fighters, the choice reaction is so quick that it gets close, from the latency time point of view, to the simple reaction.

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POSSIBILITIES TO MODERNIZE THE HANDBALL TRAINING SESSIONS AT JUNIOR LEVEL BY USING THE RHYTHMIC GYMNASTICS APPARATUS

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Abstract
Objectives. The objectives of our research mainly aimed at developing the coordination components, psycho-motricity and suppleness, but also at identifying some attractive and efficient means for the training modernization. The actuality of the topic chosen for this study is given by the changes produced in the handball game playing, determined by its very evolution.
Methods. The study was developed at the School Sports Club 6 of Bucharest and its subjects were the components of the club junior female team. The purpose was to create a training system specific to handball, which leads to the training modernization and increased efficiency. By using exercises with the rhythmic gymnastics apparatus, we mean to influence the coordination development in relation to the ball control by the female players, while performing the technical procedures.
*Results***.** We shall propose exercises performed with the rhythmic gymnastics apparatus, which can highlight the above-mentioned aspect and can also assure the novelty and attractiveness of the training sessions. We think that our scientific approach will provide some interesting perspectives of acting when confronted to the modern handball challenges.
*Conclusions.*We found out that the utilization of modern materials for the fitness improvement, such as fit-ball, stepper, boss or hoop and clubs from the rhythmic gymnastics, has increased the handball training attractiveness and has also determined the female athletes' more active involvement in the training process.
*Key-words***:** rhythmic gymnastics, handball, performance.

Introduction

Due to the fact that rhythmic gymnastics is a sports discipline that offers a great variability of acting systems based on the utilization of different hand apparatus, we aimed at integrating some of these means in handball training, by hoping that this will help us achieve the objectives of our study.

By introducing some of the rhythmic gymnastics elements in handball training and by combining them with its specific exercises, we mean to increase the classical training attractiveness and, in parallel, to further develop the motricity components that can contribute to the individual technique improvement.

Presently, the top-class athlete model embodies multiple somatic, physiological and psychic aspects, but also aspects related to physical fitness and motor capacities. It should be prepared through appropriate means, but its implementation should be as diversified as possible (Simion, Mihăilă, Stănculescu, 2011).

Training sessions imperatively need modernization, so that they represent a daily challenge for the athletes and stimulate them to actively and consciously get involved in their practice.

Purpose and hypothesis

This study started from the following hypothesis:

- We assume that, by using some of the rhythmic gymnastics means in handball training, we can optimize the specific preparation by improving the performance capacity coordination components in female junior handball players.
- The implementation of some modern preparation methods in handball training can assure the increase of sports efficiency.

The purpose of this study is to take from rhythmic gymnastics some representative preparation means and to adapt them to the handball game specificity.

We hope that, after the implementation of the technical-tactical actions that require a special ability and can be performed only by the skilled athletes, a number of players as great as possible will be able to both assimilate them and perform them with accuracy and efficiency.

The objectives of our study are:

- to modernize the training sessions at junior level, by introducing some preparation means focused on the rhythmic gymnastics techniques, in order to develop the coordination, psychomotricity and suppleness components;
- to prepare and implement a program of adapted means taken from rhythmic gymnastics, which can be introduced in the handball-specific training.

Through the achievement of these objectives, we want to complete the existing training programs, by

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hoping that we shall facilitate the Romanian handball connection to everything that means progress and modernism in the international handball.

Approached topic

The way in which contemporary sport has evolved and the necessity to achieve performances have led, in recent years, to significant progresses in sports science, by determining new approaches and substantiations of sports training (Epuran, 1990).

The continuous modernization of the training process and of the big handball competitions represents a permanent preoccupation for the whole staff of specialists and technicians, who constantly intensify their efforts and professional qualities in order to modernize and reevaluate, at a higher level, the methodology and the techniques for a successful management of the performance handball game.

Practice demonstrates us that, in the existing generations of athletes, the classical methods based on intense training loads, but with means that lack variety, doubled by the training monotony, don't have any more the expected efficiency.

Due to the society evolution, to the easy access to information (internet, specialty sites, media, television), the today's juniors have other responsibilities and multiple preoccupations in their not much available leisure time, which is reflected by their lower and lower interest in practicing performance sports.

The necessity to modernize and diversify the training means comes in reply to the challenges encountered by the technicians during the training sessions at junior level.

The adaptation of classical training methods to the modern handball trends and their diversification should increase the attractiveness of the training sessions up to the point that the today's junior can see in the handball game practice an agreeable way of spending his leisure time and, why not, an opportunity for him to achieve performances.

On the international level, there is a major interest in creating new training means adapted to the modern handball requirements, by keeping, at the same time, to the basic methodology for their introduction and adaptation to the training specific to each sports branch that uses them.

In this sense, the European Handball Federation supports the technicians' attempts by annually organizing specialization courses, where lecturers from different parts of the world present the latest interventions for the training modernization.

For instance, the lecturer appointed by the European Handball Federation, (Pollany, 2010) presented, within one of his courses given in 2011, a new program of training means containing exercises with different objects, such as: frisbee, beach ball, boomerang, badminton shuttlecock.

All these exercises were presented in the handball gym and were adapted, with the mentions that they can be adapted to the long-term training objectives and that their presentation form depends on the coaches' creativity.

The current trend in the training methodology utilization compels the technicians to be permanently connected to the novelties in the modern handball game, generated by the society evolution characteristics.

The present study gets along with these trends, the idea of using some means specific to rhythmic gymnastics taking into account that juniors' preparation is polyvalent, in order to assure the multilateral development of all the factors that influence their performance capacity. Consequently, we shall use both classical and modern training means, their selection being made according to some age-related morphological particularities and to the athletes' performance level.

Why exercises with the rhythmic gymnastics apparatus?

The present study mainly aims at creating some possibilities for the handball training modernization, but, at the same time, we underline that the implementation of the rhythmic gymnastics means will have an influence on the body functionality and will improve(Macovei, Ganciu, Ganciu, 2010):

- the muscle tone;
- the joint mobility, the extensibility and elasticity of the muscular tissues and ligaments;
- the capacities of control over one's own movements;
- the different types of coordination at the inter-segmental and inter-muscular levels;
- the control of the movement amplitudes;
- the control of the movement execution durations and pace;
- the control of the movement execution plans and directions.

The used methodology resorts to means from the rhythmic gymnastics domain and aims at developing the coordination components, so important to the learning and consolidating of the handball-specific technical procedures.

Coordination and movement are elementary requirements for the development of the capacity to practice handball, and in the coordination education, an important role is played by the amount of accumulated information (Bon, 2009).

By using exercises with hand apparatus, we mean to influence the coordination development in relation to the ball control by the female players, while they perform the technical procedures.

These exercises enable us to act on three levels: motricity, psycho-affective communication and

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creation. By their implementation, we shall influence (Macovei, 2007):

- the harmonious physical development;
- the education of the capacity to perceive and reproduce through the body movement;
- the education of the capacity to grip and manipulate different apparatus;
- the acquisition of a specific motor repertoire, able to improve the athletes' movement capacity;
- the capacity to perform successive and fluent movements.

According to the sports training principles, by using some training means taken from other sports branches, we can achieve a more efficient modeling, which helps the players enrich their technical-tactical knowledge and define their personality (Cârstea, 2000).

The utilization of apparatus that differ among them through their form and material provides the subjects a multitude of opportunities and results in the development of a wide range of motor capacities, most of them coordination-related capacities.

The modern training characteristic is given by the technical-tactical orientation transfer among different sports games.

This transfer allows generalizations synthesized in characteristics of the actuality and of the trends in course of being confirmed (Teodorescu, 1975).

Utilitarian applications

The study was conducted at the School Sports Club no. 6 of Bucharest, it had for subjects the girl junior handball players of the club team and it took place in the period August 2012 to February 2013.

We enjoyed the collaboration of the team's woman coach, who accepted to introduce in the athletes' training program the set of exercises proposed by us in this study.

Exercises were introduced in the team's training program 2 times a week, on Mondays and Tuesdays.

The team's involvement in the Girls' Junior National Championship determined us to introduce the exercises with apparatus only in the first training part, under the form of play, which included relays and some exercise circuits that aimed at developing the coordination components.

The sets of exercises represent combinations of arm and leg movements proper to rhythmic gymnastics.

They were performed with different hand apparatus and adapted so that the handball-specific objectives can be achieved.

Exercises had a ludic character, because the play facilitates spontaneous actions, develops motor intelligence, generates pleasure and diversity and allows the natural influencing of the coordination capacities (Garcia, 1990).

We present in the following tables the exercises proposed for the training program.

Exercises with hoop (table 1), under the form of play, influenced the anticipation capacity, the decision-making capacity, the motor reaction capacity, the spatial-temporal orientation capacity, all these being important to the achievement of individual and collective technical-tactical actions during a handball match playing.

The introduction of gymnastics hoops in the composition of exercises, in order to improve the ball control and the ball passing rhythm, provided the athletes new modalities to solve their training tasks, in relation to this aspect.

Table 1. Exercises with hoop

Exercises with hoop	
	**Hoop transportation:** – while running, one hand guides the hoop and the other performs dribble moves with the ball. Dribble through the hoop: – with hoop placed around the body, alternating dribble moves from inside the hoop (Kissling, 1995). Ball through the hoop: – in couples: a player rotates the hoop on floor, then both of them try to pass the ball between them through the hoop, until it falls down. **Exercise under the form of play for warming-up:** – application of the handball rules and game on all the playing field The point is scored thus: A player holds the hoop overhead, so that his teammates can pass the ball among them through the hoop. The point is validated only when the ball passes through the hoop and is caught by a player from the same team as that one who has passed the ball through the hoop. If not so, he losses the possession of the ball.

Exercises with clubs (table 2) aimed at improving the ball manipulation, by positively influencing the individual ability. These exercises involve the action of the fist and the wrist joints.

Table 2. Exercises with clubs

Exercises with clubs	
	**Ball transportation on the clubs:** – ball is equilibrated on the body of the club and is transported while running, without letting it fall down. **Dribble moves with the club:** – club grip on its neck, while its body touches the ball so that dribble moves are performed without losing the ball control. **Small circles:** – clubs are rotated around the grip point – the fist; rotations are performed in the sagittal, frontal and horizontal plans (Macovei, 2007). **Mills:** – performed in all the plans

Exercises with ribbon (table 3) aimed at developing the arm-leg movement coordination and at improving the locomotor apparatus functionality.

Table 3. Exercises with ribbon

Exercises with ribbon	
	**Leaps over the ribbon:** – horizontal circular underfoot balance with leap over the ribbon **Spiral on the floor:** horizontal *spiral* on floor, with passage through the ribbon drawing (S. Macovei, 2007).

Exercises with rope (table 4) had for goal to improve the ball perception and passing in the conditions encountered during a match, but also to develop the rhythmicization capacity.

Table 4. Exercises with rope

Exercises with rope	
	**Exercises performed by four players:** – two players hold the rope and rotate it, the third skips the rope and passes the ball to his teammate. **Exercise: "the snake**": – a player holds the rope at one end and rotates it around him, so that the rope is stretched and doesn't touch floor. His teammate, positioned at about 2 meters away from him, will skip the rope each time when it arrives in front of him. **Skips:** – horizontal circular underfoot balance and skips over the folded rope held in one hand at both ends.

Exercises with ball (table 5) had for goal to develop the ball control and also to improve the capacity of kinesthetic differentiation.

Table 5. Exercises with ball

Exercises with ball	
	**Dribble moves:** – exercise with two balls, one of handball, the other of rhythmic gymnastics. Alternating and simultaneous dribble moves, without losing the ball control. **Ball passing, exercise in couples:** – each player has a gymnastics ball. – players pass the handball ball among them. – before catching the handball ball, each player throws overhead the gymnastics ball and, after he passes the handball ball, he tries to catch the gymnastics ball before it touches floor.

The exercises proposed by us were used in the competitive period, but they can also be used in the pre-competitive period.

We mention the possibility to create sets of exercises adapted to the preparation period or to the training objectives.

The utilization of these means allows the technicians to juggle with them and to diversify the modality of introducing them in the training program.

The utilization of exercises with apparatus specific to rhythmic gymnastics complete the existing system of means, by facilitating the handball technique assimilation and learning, as well as the creation of a set of exercises that can be introduced in the handball-specific training.

The utilization of these training means improves the coordination capacity components, such as: spatial orientation capacity, rhythm capacity, capacity of differentiating and leading the body movements, motor learning capacity, balance capacity, ambidextrousness.

A low coordination level renders difficult the assimilation and learning of the handball-specific technical procedures, which reflects how it is important to use these means almost in each training session, at junior level.

We can thus avoid educating some future senior handball players who are not able to fully master the technical procedures necessary to practice the handball game at the performance level.

Discussions

The handball training modernization enjoys the attention of the specialty federations that promote different researches within the specialization courses for coaches.

The idea to develop the coordination-related aspects, so necessary to the handball player, by using

some complementary means, is accepted and promoted by different authors or lecturers participating in the international courses for the coaches' upgrading.

Bon (2009) recommends the utilization of balls having different sizes (for instance, those of volleyball, basketball, field tennis), in order to develop the coordination skills specific to the technique with the ball.

In the same train of ideas, Tamljanovic (2010) presents, in his methodical lessons, handball-specific exercises, by using sticks, rolls, fit-balls and bosses, already consecrated objects due to their beneficial influences on the development of coordination skills.

By adhering to these conceptions, we used in the present paper some means from the rhythmic gymnastics, which we adapted to the handball game specificity.

The motivation and the originality of our approach consist in the formative-educative valences of this discipline and in its major implications on the development of the coordination components.

The exercises introduced in the training program aimed at developing some coordination components necessary to assimilate the basic handball technique, in parallel with the increase of the lesson attractiveness.

Conclusions

We think that the introduction of exercises with apparatus proper to rhythmic gymnastics in our girl athletes' program represented a beneficial and attractive activity that diversified and completed their preparation, by placing a special emphasis on the coordination development.

By analyzing, through the observation method, the female junior players' qualitative evolution during the training sessions, we noticed an improvement of their self-confidence, but also of the confidence in their physical and technical-tactical capabilities.

We hope that the introduction of these means in the female junior players' program can represent a methodical intervention appropriate to the training conception improvement.

The training modernization will create new interesting perspectives of acting when confronted to the modern handball challenges and the utilization of these exercises will provide the athlete the possibility to find an efficient solution to the stimuli encountered during the game playing.

By stimulating the attractive character of the training sessions, that should develop the athletes' active involvement in the game playing, we also aim at increasing the interest in this sports discipline, reflected by the more and more increased number of children eager to practice handball.

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EFFICIENCY OF BODY BALANCE EXERCISES ON THE ABILITY & FLEXIBILITY OF THE LOWER LIMB, THE SKILFUL AND RECORD LEVEL FOR CONTESTANTS OF THE TRIPLE JUMP

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Abstract
Purpose. The position of the body balance is considered an essential component in most of the athletic activities generally, and in the field & track competitions especially. It is a main factor in activities which require a sudden change in movements in which the player lose his balance, and the necessity of regaining this balance quickly to start a new movement. This study aims to identify the effect of balance body position exercises concerning stretching on the ability & flexibility of the lower limp, and the triple jump performance in female physical education students.
Methods. The sample contains (20) students from the second year, has been randomly assigned to control and experimental group. Homogeneity and equality between groups were considered in the following variables: age, height, weight, ability of legs' muscles(A, M, L), flexibility of legs' joints, consists of hip drape (F, H, D), extend the hip (F, E, H), knee drape (F, K, D), exit end the knee (F, E, K), feet drape (F, F, D), extend the feet (F, E, F), the skilful level consists of distance of the Hop (D, H) , distance of the step (D, S), distance of the jump (D, J), and the digital level (D, L). The experimental group was subjected to 8 weeks, 3 sessions weekly, with a total of 24 training sessions of balance body position exercises training. The medical protractor was used to measure flexibility of the joints and jumping ahead with both legs to measure the explosive power of the lower limb
Results. The data showed a significant exceeding of the experimental group compared with the control one of the study variables (legs' ability which (U=*18. -), flexibility of leg joints, which (U=*12. -) (U=*15. -) (U=*2. 50-) (U=*3. -) (U=*9. -) (U=*4. 50-), skilful and digital level) which (U=*12. 5-) (U=*9. -) (U=*3. -) (U=*1. -) of contestants the triple jumping ($p< 0.05$).
Conclusions. According to the results, consider raising the efficiency of responsible muscles about balance body position in order to be able to perform stretching exercises from the best position of the body which leads to the efficiency of such exercises and the resulting improvement in the skilful and digital level of the contestant**.**
Key words: Balance Exercises, Ability, Flexibility, Triple Jump.

Introduction

Improving body balance is important for effective athletic performance because agility relies on proper balance. Striving to improve balance is a good idea for everyone, because having good balance makes a person steadier on his or her feet and this may help prevent dangerous falls.
The position of the body balance is considered an essential component in most of the athletic activities generally, and in the field & track competitions especially. It is a main factor in activities which require a sudden change in movements in which the player lose his balance, and the necessity of regaining this balance quickly to start a new movement (Foad, 1995)
The expression of body position refers to the relationship between the different parts of the body. Its importance is clear as the proper body position represents the fundamental base for training styles. Exercises starting with incorrect body position do not achieve the desired goal, which causes the increase in certain tissues' job and the decrease in other tissues' job. Consequently it leads to imbalance on the short run concerning the strength and flexibility (Norees, 2008).
Reaching to and keeping the balanced body position is achieved by both muscles and tissues which lack the ability to contract on their own. Therefore the balance between muscles responsible for the movement and those responsible for the body balance position is highly important (Norees, 2008).
The triple jump completion is considered one of the complicated ones which require full cooperation between each of the nervous and muscular systems in order to be able to perform the best movements (A. Abd El Hameed, 2009). The focal base is changing more than once to reach the desired goal, so the movement balance is considered one of the most

important physical characteristics needed for the triple jump player, for its ability to control and combine movements (Anetabeen, 2004). The experiments proved the importance of studying gravity centre of the body during performing the triple jump (Ahmed, 1997).

Keeping balance of the body position is achieved through prolonging the tensed muscles, and increasing the stiffness of the balance muscles (Norees, 2008)

Balance' muscles tend to be deep inside the body and keep body position, such as the deep abdominal muscles and the hip muscles. Those muscles slightly contract, yet stay contracted for a long time, so the stiffness of those muscles are limited , and in a relaxing condition. Muscles malfunction and disorganizing cause difficulty of the nervous pulses to reach those muscles, though they control all muscles (Norees, 2008).

The researcher noticed, through her teaching of the triple jump, the deficiency of the skilful and digital level of the students which may be because of the decrease in flexibility and ability level of their lower limb. Those physical elements are very important and related to the triple jump which may suggest that the benefit of such exercises is not enough to perform the skill better, as the ability element is one of the most important special physical elements in triple jump (Ahmed ,1997) which need enough strength for all the holding muscles for the joints of limbs, knees, and foot ankle to push the body to the required direction (The Egyptian Federation of athletics for amateurs, 1995) .The ability of legs' muscles is clear through the work of movement joints in the body during the extending and draping of the leg joints in the most important stages of the movement work in the triple jump , they are (hop - step – jump) as the ability factor plays a very active and positive role in the jump level (Ahmed , 1997).

As the triple jump skill is one of the complicated movement skills which require repetitive and fast movements where the movement series of take-off, flight , and landing are repeated three times, the final results specified by the level of the horizontal speed in the take - off movement (K. American Sport Norees , 2008 & education program , 2008) and depends mainly on the lower limb of the body in the movement, so it is necessary to train on how to reach and keep the balance of the pelvis area, and the lumber spine before starting the exercises of prolonging the lower part muscles.

Consequently there is an improvement in the functional efficiency of muscles which appear in the developed skilful and physical performance. Thus the player can perform movements on a large scale and with the best production of strength and speed, and this is because of the importance of prolonging the joints of the limb, knee, and the foot to the maximum possible degree during the take – off (Abd el Hameed, 2009) and the importance of the balance strength in the pelvic area and the back bone to achieve the flexibility and strength of the lower limb (Porcary, et al. 2011). So the researcher performed such a study in a trial to keep the balanced position of the body during performing the prolonging exercises and benefitting of them in functioning the muscle positively during performing the movement.

The purpose of the study is to examine the effectiveness of the proposed program to keep the balanced position of the body in correspondence with the prolonging processes on the strength and flexibility of the lower limb, and the level of the skilful and digital performance of the triple jump competition.

Materials and Methods

The researcher used the experimental method by designing two groups, one of them is experimental and the other is control by applying the pre post test to measure each of (the ability of legs' muscles using the test of broad jumping with the feet) , (the flexibility of the legs' joints using the medical protractor to measure the flexibility and it includes the extending and draping of the limps' joints – extending and drapding of the knees – extending and draping of the feet) , (level of the skillful performance and it includes the length of the hop distance – the length of the step distance – the length of the jump distance) , and (the digital level of the triple jump)

Participants

The sample was chosen by the random and intentional method from the female students in the second year in the faculty of Physical Education for girls , their number is (20) students , as per (10) students for each group , homogeneity and equality of the sample were considered in the sample in: age, height , weight , and all the study variables . The proposed training program was applied using the special exercises for keeping the balance of the pelvis and the lumber spine accompanied on the experimental group with the prolonging exercises for the lower part of the body which use in the traditional program in the college. Same prolonging exercises were only applied to the control group for (8) weeks per (3) training sessions a week.

Program Procedures

The training program contains the special exercises of keeping the balanced position of the pelvis and the lumber spine area as the study concentrates on the lower limb of the body which depend on the deep abdomen muscles, such as the Internal Oblique muscle, and the Transverses Abdomens muscle, and the flat abdomen muscles, such as the External oblique muscle, the Rectus Abdomens and the gluteal (K. Norees, 2008). As the exercises of the deep abdomen exercises ranging from (8 – 20) time with considering that performing some of the abdomen exercises on an

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unstable base, such as the Swiss ball, as it helps the flat and deep abdomen muscles to perform more efficiently (Anetabeen, 2004) and practicing the exercises of the lower part slowly, and with encouraging to keep the final position of the prolonging for a time ranges from (20 – 30) seconds, with breathing naturally and feeling of relaxing. Prolonging exercises which use in traditional program such as the prolonging of the hip Flexor muscle and the iliopsoas muscle, and the Hamstring muscle should be appropriate to the levels of the beginners and increase gradually to the intermediate level (Norees, 2008).The intensity of the exercise ranges from (50 – 80 %) from the maximum number a person could stand using the periodical training method: law and high intensity, and with an increase of 5% each week. The training groups range from (3 – 6) ones and the time of each range from (30 – 90) minutes including the warming and calming down periods, the in between periods of rest range from (30 – 60) seconds between repetitions, and from (60 – 180) seconds between groups.

Procedures. Measures were performed before and after the training program for all the study variables which are:

Ability for leg muscles (A, L, M) , flexible joints of legs consists of { drape the hip (F,D,H) , balance the hip (F,B,H) drapes the knee (F,D,K) , balance the knee (F,B,K) ,drape the feet (F,D,F) , balance the feet (F,B,F) } and level of skill consists of { distance Hop (D, H) , distance step (D, S) , distance jump (D,J) } and level digital (L,D)

Data Analysis. All statistical analyses were performed using the non-parametric statistics and it includes the Descriptive Statistics and the Wilcoxon Signed Test (Z), and the Mann – Whiney test (U) as per 0.05<P as P was considered as Statistically Significant

Results

Table.1 shows that significance clear positive differences for the post tests in (A,L,M) (F,D,H) (F,B,H) (F,D,K) (F,B,K) (F,D,F) (F,B,F) (D, H) (D, S) (D,J)and (L,D) in the experimental group.

	Pre test		Post test					Pre test		Post test			
Variables	mean rank	Sum of ranks	Mean rank	Sum of ranks	Z	sign	Variables	Mean ranks	Sum of ranks	Mean ranks	Sum of ranks	Z	sign
A,L,M	-	-	5.50	55.	*2.80	.005	F,B,F	-	-	5.50	55.	*.05	..005
F,D,H	-	-	5.50	55.	*2.81	.005	D, H	-	-	5.	45.	*.08	.008
F,B,H	-	-	5.-	45.	*2.67	.008	D, S	-	-	5.50	55.	*.05	.005
F,D,K	-	-	5.50	55.	*2.82	.005	D,J	-	-	5.50	55.	*.05	.005
F,B,K	-	-	5.50	55.	*2.82	.005	L,D	-	-	5.50	55.	*.05	.005
F,D,F	-	-	5.-	45.	*2.69	.007							

Table.2 shows that significance clear positive differences in (A,L,M) (F,B,H) (F,D,K) (F,B,K) (D, H) (D, S) (D,J)and (L,D) for the post tests also shows that no significant positive for the post tests in (F,D,H) (F,D,F) (F,B,F) in the control group

	Pre test		Post test					Pre test		Post test			
Variables	mean rank	Sum of ranks	Mean rank	Sum of ranks	Z	sign	Variables	Mean ranks	Sum of ranks	Mean ranks	Sum of ranks	Z	sign
A,L,M	-	-	5.50	55.-	*2.80	.005	F,B,F	4. -	16.-	4. -	12.-	.342	.733
F,D,H	7. 50	7. 50	4.69	37.50	1.77	.075	D, H	3. 25	6.50	6. 06	48.50	*2.15	.031
F,B,H	1. -	1. -	4.50	27.-	*2.23	.025	D, S	-	-	5. -	45.-	*2.67	.007
F,D,K	-	-	5.50	55.-	*2.81	.005	D,J	-	-	5. 50	55.-	*2.81	.005
F,B,K	3 . -	6. -	5.57	39.-	*1.97	.048	L,D	-	-	5.50	55.-	*2.81	.005
F,D,F	6.17	37. -	4.50	18.-	.977	.329							

Table 3. Shows the Mean rank, sum of rank and U score in(A,L,M) (F,D,H) (F,B,H) (F,D,K) (F,B,K) (F,D,F) (F,B,F) (D, H) (D, S) (D,J)and (L,D) between post tests for the Experimental and control group which the experimental group was more superior to the control group in all variables than control group.

Variables	Experimental group	control group	U	sig

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	mean rank	Sum of ranks	mean rank	Sum of ranks		
A,L,M	**13.70**	**137.-**	**7.30**	**73.-**	***18.-**	**.014**
F,D,H	**14.30**	**143.-**	**6.70**	**67.-**	***12.-**	**.004**
F,B,H	**14.-**	**140.-**	**7.-**	**70.-**	***15.-**	**.007**
F,D,K	**15.25**	**152.50**	**5.75**	**57.50**	***2.50**	**.00**
F,B,K	**15.02**	**152.-**	**5.80**	**58.-**	***3.-**	**.000**
F,D,F	**14.60**	**146.-**	**6.40**	**64.-**	***9.-**	**.002**
F,B,F	**15.05**	**150.50**	**5.95**	**59.50**	***4.50**	**.001**
D, H	**14.25**	**142.50**	**6.75**	**67.-**	***12.5**	**.004**
D, S	**14.60**	**146.-**	**6.40**	**64.-**	***9.-**	**.002**
D,J	**15.20**	**152.-**	**5.80**	**58.-**	***3.-**	**.000**
L,D	**15.40**	**145.-**	**5.60**	**56.-**	***1.-**	**.000**

Discussion

It is clear from the statistical analysis of table (3) the improvement in each of : Ability for legs' muscles (A,L,M) , flexible joints of legs consists of drape the hip (F,D,H) balance of the hip(F,B,H)drape the knee (F,D,K),balance the knee(F,B,K), drape the feet(F,D,F),balance the feet (F,B,F) and level of skill consists of distance Hop (D,H) ,distance step D,S), (distance jump(J,D) and level digital(L,D) for the experimental group comparing to the control group in the post tests. The researcher attributes this to the systematic training of the proposed program exercises specialized for the deep and flat abdomen muscles which are responsible for the body balance as it helped the passing of the line of the body gravity center through the stability base and its existence in the middle of the body which helps reaching the right position of the body (Norees, 2008). As the flat abdomen muscles pull the pelvis to the rib cage when performing the tensing whereas the deep abdomen muscles pull the abdomen wall to the backbone, and consequently they have greater ability to keep the balance of the trunk, (Norees, 2008). References point out that the exercises of the deep abdomen muscles lead to the reaching of the nerve pulse, which control all the muscles, to the deep muscles, and change the bad functioning of the muscle to its good functioning and achieving the right body position which represents the base for coordination between body muscles and the resulting full benefit from this exercise (Norees, 2008). So , the researcher attributes the improvement in the ability and flexibility of the lower limb of the sample participants in the experimental group to the positive influence of the balance exercises specialized for the area of pelvis and back bone and reaching the body balanced position during the performing the movement which lead to performing the prolonging exercises related to the skill type of the lower limb effectively with the benefit from them and the consequent results of the efficiency of the exercises of ability and the flexibility of the joints dealt with by the researcher during her training for the triple jump. (Frederick & Frederick, 2006) and (Brain, et al. 2007)confirmed that as they point out that prolonging muscles from the right position of the body gives muscles the ability to perform their function more effectively and producing an amount of speed and strength. This is because of the keeping the flexible energy in the muscular tissues during the prolonging stage, then it is released to perform highly contracting movements. This is matching with the study of (Bazett – Jones, et al. 2009) ; Wong , et al. 2011) (Fletcher , 2009) as they pointed out that the 6 – week training period of the prolonging exercises for the legs affect the speed, ability, and flexibility of athletes.

The researcher attributed the improvement occurred in the experimental group in the skillful level in comparing to the control group Table 2 to the positive effect of the proposed program and the reaching to the balanced body position in the pelvis and back bone area and the improvement of the muscles' ability and the joints' flexibility ,which on its role leaded to the improvement of skillful level concerning the coordination in distances in all the stages of triple jump (hop – step – jump) resulting from the active extending of the limb, knee, and the ankle joints to the maximum degree in each take - off point from the different stages of jump and also the active bending to complete the rest of the stage . (The American Sport Education program, 2008) refers to the necessity that all triple jump stages should be almost equal and this is matching with the study of (Wilson , et al. 2008) as they point out that the most skillful triple jump players and who enjoy high level of balance during movement got high scores in coordination between the different jump stages comparing with less skillful players and this is a result of the regular training , this is confirmed by (Alfanno , 1994) (Homel , and Muller , 1999)(Wilson , et al. 2009) also points out that the intensive trainings similar to the skill were more effective in coordination models in the triple jump stages . The

study also is matching with (Foad , 1995) & (Saad , 2002) as they point out that the right performance of the skill requires a player's high ability to keep the body in a balanced position, and that the international players score supremacy concerning the flight angle of the take- off for each of the hoop, the step, and the jump .

The researcher attributes the improvement in the digital level of the experimental group compared with the control group to what have been improved in each of the legs' ability and flexibility and the skilful level in the triple jump as the (The Egyptian federation of Athletics For Amateurs 1995) referred to the importance of acquiring and mastering the skill of triple jump.

This is matched with the study of (Mohamed, 2010) (S. Rushdie, 2007) (O. Ahmed, 2002). As they pointed out that players who use the highest degree of leg strength score supremacy in the digital level of triple jump.

Referring to table 1, it is clear that there are substantial differences in the control group in post-measures compared to the pre-measured in all variables except in (F, D, B), (F, B, F) (F ,D, H) .This improvement is attributed to the traditional program accompanied with the exercises of triple jump. The researcher attributes the occurring deficiency in the flexibility of some joints, and the decrease in the improvement percentage in all variables comparing to the experimental group to the inability to reach the balanced body position during the performance of prolonging exercises. The imbalance of muscles during the movement is producing changes in the body position and the decrease in the strength and in the performance level (Ban, 2008) this also matches with (Rawhy, 2010) as she referred to the importance of balance element in achieving the ability necessary for succeeding the skill accuracy.

Conclusion

The researcher recommended the necessity of focusing on the exercises which achieve the balanced body position before starting in the prolonging exercises for their significant role in achieving the hopeful benefit from the physical fitness elements, and the digital and skilful level for the triple jump and the other sport activities.

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INDICES TECHNIQUES TO A GROUP OF CHILDREN WITH AGE OF 8 YEARS FOOTBALL

MELENCO IONEL[1], STĂNCULESCU GEORGE[1], POPA CRISTIAN[1]

Abstract

*Purpose***.**The paper aims to examine how techniques have evolved some indices over two years to a group of children aged 8 years players. We want to see if my training during this period led to significant improvements in indices of the children tested techniques. Also consider it very important that acquiring basic technology in football to be made at early age.

Research methods

In our research we used a number of known methods for investigating the technical parameters. To solve the proposed tasks we used the following methods: literature review, teacher observation, test method, teaching experiment, statistical and mathematical method.

*Results.*The test showa us significant differences between test 2 then test1.

Conclusions

Comparisons within the group in terms of technical performance revealed significant differences between tests. We believe that progress was due to use of our training. Significantly better results achieved by children in these technical tests confirm the hypothesis of the paper.

Keywords: football, child development, technical indices.

Introduction

French philosopher Jean-Paul Sartre said: "In football everything is complicated by the presence of opposing teams!" Football has become a kind of chess game in which teams think long before the opponent moves. Football is a miracle, Andre Maurais said: "This sport is nothing but an intelligence in motion". Ekblom, (1989) describes the efforts of the football game as one flash, but high intensity. Also, he says that we encounter in the game efforts relatively short but high intensity alternating with great efforts, but low intensity. Aime Jacquet (1999), says that the versatility

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factor is a key player in the constitution of his band. Ozolin N.G. (1972) sports training defines teaching as a process of education and training of the athlete and not a process of training. Harre D. (1973) considers training to be a planned process of preparing athletes to achieve superior results.

The importance of technical factors are reflected in the influence it exerts on other factors and especially the tactical factor. To apply superior tactics to achieve easier tactical ideas are needed primarily technical executions supperior. When players have a rich stock of technical knowledge they have more opportunities to make creative and appropriate in every situation tactical game (Ionescu, 1995). Thinking and creative imagination can successfully manifest only when the player has the technical skills, developed to perfection, virtuosity. Knowing and possessing well a large variety of techniques, the player can perform tactical plan designed without apparent difficulty.

The player is technical perfection, the more it needs less energy to achieve a certain action. As such, the equation seems to express the reality of the game: good technique - high efficiency.

A problem faced by the correlation technique to the psychological background of the game relates to the capacity of the player as of all its technical skills to filter only maneuvering for tactical reasons, needed efficiency of each phase of the game. Player filtering of several possibilities must eventually reach the optimal technical solution. Quality of shares is determined by the optimal solution of each tactical tasks.

Tactics technical skills necessary to use technology in such a way as to achieve in any case the player with the ball a certain gain. The player must exercise selectivity of the technique, ie to discern the large amount of technical solutions is offered, the one that has a high degree of effectiveness.

technical terms, we can say that now it is complex, fast, adequate variety of game situations. In football today, technical management features are multiple, but have in common the need to make clear decisions in a short time the game ever smaller spaces. Technology today is tacticizată game, each technical element must address the requirements of the game, the tactical significance of the fairway with increasing the constructive spirit and aggressive (Ionescu, 1995).

Objective

To develop our study we set the following tasks:

- ✓ Develop and implement a drive system in the footballers aged 8 years.
- ✓ Develop and implement a battery of tests to check the preparedness of the group.
- ✓ Collection and interpretation of the effectiveness of our research and applied systems.

Research methods

In our research we used a number of known methods for investigating the technical parameters. To solve the proposed tasks we used the following methods: literature review, teacher observation, test method, teaching experiment, statistical and mathematical method.

Experiment content

The experiment took place at FC Portsmouth in the group of children born in 2004. Group selection was made during 2010,and for the duration of the experiment was conducted over 120 training. This experiment involved 10 children. Throughout the period of the experiment (January 2011 - January 2012) were performed by three workouts per week. The presence of children in the training group was 80%. In the experimental group children were subjected to the following technical tests: keeping the ball in the air by successive blows with deft foot alternately with both legs shot on goal in the fixed area, care aisle.

Tests

1. Keeping the ball in the air by successive strokes (skilled foot).
2. Keeping the ball in the air by successive blows alternately with both feet.
3. Shot on goal in the fixed area (10 executions). Player leads the ball and shoots at goal from 10 meters with full shoe. Is required to shoot for over gate (gate size of 2/5metri).
4. Pass the aisle (10 executions). Draw a corridor 10 meters long and 1.5 meters wide. The player must hit the ball and send it across from side to side of the aisle.

Note that the trainings were conducted in room or outdoor (grass field). In the training I used:

- Exercises to develop the reaction rate, displacement and coordination, (15-20 minutes / week);
- Ways of driving the ball with the foot; (10-15 minutes / week);
- Ways to improve the sense and control the ball, (12 minutes each workout);
- Learning transfer across the ball with (3 / week), to take over the ball (3 / week);
- Learning the shot at goal with full shoe (3 / week).

Results

Table 1

Nr. crt.	Name and surname	Maintaining skilled foot January 2011	Maintaining skilled foot April 2011	Maintaining skilled foot August 2011	Maintaining skilled foot January 2012
		Testing 1	Testing 2	Testing 3	Testing 4

1	**C. L.**	2	25	51	88
2	**Ţ.T.**	3	20	93	126
3	**F. T.**	2	35	111	185
4	**L.D.**	3	250	541	650
5	**D. R.**	2	30	105	145
6	**B.D.**	3	16	41	85
7	**N.D.**	2	415	841	2618
8	**G.A.**	4	220	580	1116
9	**M.A.**	2	70	326	525
10	**R.V.**	4	110	361	440
	X+ DS	**2,7+ 0,82**	**119,1+ 134,03**	**305+ 274,66**	**597,8 + 781,98**
	CV	**30,48**	**112,53**	**90,05**	**130,81**
	t		**2,74 (a)**	**3,97(b)**	**2,30 (c)**
	p		**< 0,05**	**<0,01**	**p< 0,05**

(a) significantly different from test 1 (p <0.01);
(b) significantly different from test 2 (p <0.05);
(c) significantly different from test 2 (p <0.05).

Table 2

Nr.crt.	**Name and surname**	**Keeping both feet alternately January 2011**	**Keeping both feet alternately June 2011**	**Keeping both feet alternately January 2012**
		Testing 1	**Testing 2**	**Testing 3**
1	**C. L.**	2	7	24
2	**Ţ.T.**	2	7	33
3	**F. T.**	4	10	35
4	**L.D.**	8	47	77
5	**D. R.**	4	20	36
6	**B.D.**	3	8	32
7	**N.D.**	10	264	314
8	**G.A.**	10	100	153
9	**M.A.**	8	101	121
10	**R.V.**	8	90	110
	X+ DS	**5,9+ 3,213**	**65,4 + 80,34**	**93,5+ 89,73**
	CV	**54,45**	**122,85**	**95,96**
	t		**2,41 (d)**	**6,80(e)**
	p		**< 0,05**	**< 0,001**

(d) significantly different from test 1 (p <0.05);
(e) significantly different from test 2 (p <0.001).

Table 3

Nr.crt.	**Name and surname**	**Shot in the fixed area January 2011**	**Shot in the fixed area June 2011**	**Shot in the fixed area January 2012**
		Testing 1	**Testing 2**	**Testing 3**
1	**C. L.**	2	4	5

2	**Ţ.T.**	2	4	6
3	**F. T.**	3	5	6
4	**L.D.**	2	5	7
5	**D. R.**	4	8	8
6	**B.D.**	2	5	6
7	**N.D.**	4	9	10
8	**G.A.**	4	9	10
9	**M.A.**	2	5	5
10	**R.V.**	2	5	5
	X± DS	**2,7± 0,94**	**5,9 ±1,96**	**6,8± 1,93**
	CV	**35,14**	**33,37**	**28,41**
	t		**8,91 (f)**	**3,85 (g)**
	p		**p< 0,001**	**p< 0,01**

(f) significantly different from test 1 (p <0.001)
(g) significantly different from test 2 (p <0.01)

Table 4

Nr.crt.	Name and surname	Pass the aisle June 2011	Pass the aisle January 2012
		Testing 1	**Testing 2**
1	**C. L.**	4	6
2	**Ţ.T.**	4	6
3	**F. T.**	4	6
4	**L.D.**	6	7
5	**D. R.**	3	5
6	**B.D.**	3	5
7	**N.D.**	7	9
8	**G.A.**	7	9
9	**M.A.**	3	5
10	**R.V.**	3	5
	X± DS	**4,4 ±1,64**	**6,3± 1,56**
	CV	**37,43**	**24,87**
	t		**19 (h)**
	p		**p< 0,001**

(h) testing significantly different (p <0.001)

Discussions

Exercise 1. The exercise of keeping the ball in the air Differences between trials (January 2011-January 2012) (p <0.05, p <0.01).

Exercise 2. In keeping exercise ball with both feet differences (p <0.01 - p <0.001) between tests.

Exercise 3. Also, the exercise shot on goal in the fixed area there is a good development results from testing. Table 3 shows that significant differences exist in this exercise, players have progressed significantly between trials (p <0.01, p <0.001)

Exercise 4. To exercise care aisle, players were able to by successive blows foot skilled observed significant d alternatively there is a positive development of results between trials (January 2011-January 2012). From Table 2 it is noted that this evidence significant progress between the two tests. It appears that two results are significantly better test than a test. (P <0.001, Table 4). Yamanaka, K et. 1991 compared the technical indicators teams in Europe.

Conclusions

Comparisons within the group in terms of technical performance revealed significant differences between

tests. We believe that progress was due to use of our training. Significantly better results achieved by children in these technical tests confirm the hypothesis of the paper.

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THE EFFECTS OF SOCCER POSITIONS ON BONE STRENGTH

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Abstract

*Purpose***.** Soccer can be classified as an impact loading sport. Because it characterized by various types of running with rapid changes in direction starts, stops, jumping and kicking, resulting in large ground reaction force (GRF) at the skeleton. The aim of this study was to determine the Effect of playing positions on bone mineral density (BMD), bone mineral content (BMC) among Egyptian professional soccer players.

Methods. Data were collected on professional players from three positional Groups (defenders, midfielders, strikers) representing various Egyptian Premier League clubs during the 2011-2012 season. The committee granted ethical approval from the EgyptianFootball Association. 42 players (14 defenders, 16 midfielders, 12 strikers) from three different teams were selected in the study. All subjects were free of any disorders known to affect bone metabolism, such as bone fractures, osteoporosis, diabetes and cardiovascular disease. The participants did not report use of any anti-seizure drugs, alcohol and cortoon consumption, neither smoking cigarette. Regional BMD was measured by a bone densitometer (QDR-1000®, Hologic Inc., and Waltham, Massachusetts, USA) using dual-energy x-ray absorptiometry. The measured regions where lumbar spine (L2, L3, L4) and the femoral regions of the kicking leg, neck (NECK), trochanter (TROCH), ward's triangle (WARDS). The region "lumbar spine" (L2-L4) is defined by the mean value of L2, L3 and L4; the coefficient of variation was < 1.5%.

Results. There was a Significant Difference between Defenders group and the Midfielders group in BMD of Fem Neck for Defenders group. Significant Difference between Defenders group and Strikers group in BMD of Fem Neck for Defenders group. No Significant Difference between Midfielders group and Strikers group in BMD of Fem Neck. Significant Difference between Defenders group and Midfielders group in BMD of Troch for Defenders group.Significant Difference between Defenders group and Strikers group in BMD of Troch for Defenders group. No Significant Difference between Midfielders group and Strikers group in BMD of Troch. No Significant Difference between all groups in BMD of Wards – Tri. Significant Difference between Defenders group and Midfielders group in BMD of L2-L4 for Defenders group.Significant Difference between Defenders group and Strikers group in BMD of L2-L4 for Defenders group. No Significant Difference between Midfielders group and Strikers group in BMD of L2-L4. Significant Difference between Defenders group and Midfielders group at BMC of Fem Neck for Defenders group.Significant Difference between Defenders group and Strikers group at BMC of Fem Neck for Defenders group.

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Conclusions. This analysis has shown that the assessment of bone mineral density , static muscular strength and kicking distance according to field positions among soccer players has very important, and coaches Must be developed and modified their training load according to individual capacity.

Key words: Bone Mineral Density, Positions, Static Muscular Strength, soccer.

Introduction

Soccer is probably the most popular sport among the male population in the world, At least 200 million licensed players participate in soccer and 20 million soccer games are arranged each year in the world (Witvrouw et al. 2003). Skilled movement must be executed under the situation of match related conditions of restricted space, limited time, physical and mental fatigue and opposing players. Soccer players have to possess moderate to high aerobic and anaerobic power, have good agility and joint flexibility, and be capable of generating high torques during fast movements (Reilly et al. 2000).

Assessment of physical and physiological profiles on soccer players has become important in recent years, in that training load can be decided according to individual capacity.

Research in soccer physiology and medicine has seen notable development in recent years. Investigations of the ideal physiological and anthropometric characteristics of successful soccer players (Bangsbo, Mizuno, 1988; Shephard, 1999) have shown that there has been a notable increase in the overall intensity of the game which can be attributed to the increase in the speed and agility of the players

Bone is a vital tissue with three functions: 1) to provide maximal mechanical competence with minimum weight for locomotion, 2) to protect the internal organs, and 3) to participate in minerals and blood cell homeostasis. Numerous factors such as age, gender, ethnic and body size, nutrition habits and level of physical activity can effect on bone. (Currey, 2002: Morgan et al. 2008)

Osteoporosis is a systemic disease of the skeleton with reduced bone mass and structural deterioration of the bone tissue, resulting in a higher incidence of fractures. Bone structure and bone tissue metabolism are determined by the individual genetic predisposition and the influence of endocrine and mechanical factors. (Aloia et al. 1995; McLeod et al. 1998)

However, it is widely believed that physical activity has an important role in maximizing peak bone mass and reducing subsequent rates of bone loss. Observational epidemiological studies have consistently found that athletes have higher bone mass than people leading lifestyles that are more sedentary. In addition, the amount of load that is exerted on the skeletal tissue appears to be of importance. A number of studies of bone mineral density (BMD) among athletes showed that athletes who participated in "Impact - loading" sports (sports producing ground reaction forces greater than or equal to 3 times the body weight) had greater BMD than athletes who participated in a non-gravitational sport. (Grimston et al. 1993)

The knowledge of the mechanisms of skeletal adaptation to mechanical loading and to metabolic conditions caused by physical activity is essential to prevent osteoporosis. Athlete studies can help to identify potential risks in young people for developing osteoporosis in their later years. (Timo et al. 2010)

Soccer can be classified as an impact loading sport (Alfredson et al. 1995). Because it characterized by

various types of running with rapid changes in direction starts, stops, jumping and kicking; resulting in large ground reaction force (GRF) at the skeleton . (David et al. 2006) demonstrated that weight-bearing sport activities involving rapid directional changes, starts, stops and GRF promotes bone deposition in pre pubertal and post pubertal age .

Soccer players are expected to have different physiological characteristics according to their playing positions (Dunbar, Power, 1995). On the other hand, some authors have reported that soccer players have similar physiological capacities in all playing positions (Capranica et al. 2001; Chamari et al. 2004; Guner et al. 2006).

Data on the impact of soccer on BMD of weight-bearing and non-weight-bearing remain scarce.Most data focused on determining BMD of dominant and non-dominant leg. (Nazarian et al. 2010) Dominant Lower Limb and Non Dominant Lower Limb (Nazarian et al. 2009). Or investigated the influence of two different types of weight-bearing activity on (BMD), bone mineral content (BMC), in late adolescent girls. Moreover, to recognize if female soccer players showed signs of skeletal adaptation

Unfortunately, physical activity and training do not always have positive effects on bone metabolism. Under certain conditions high level sports and even ambitious recreational sports can affect bone mass adversely. Even high levels of training may not help to increase or even lower BMD, when the kind of mechanical loading of the skeleton is inadequate or if other components of bone metabolism (e.g. Nutrition, hormonal balance) is affected. There are a number of athlete studies that describe low BMD especially insports where body weight can be a limiting factor in performance, where high training volumes are common and where the reproductive function can be altered, for example in long-distance running and cycling (Bennell et al. 1996; Voss et al. 1998; Nichols et al. 2003)

Although, Understanding their bone adaptation may assist coaches when preparing different training programs for defenders, midfielders and strikers, showed differences between these positions be established.

Hence, the aim of this study was to determine the Effect of playing positions on bone mineral density (BMD), bone mineral content (BMC) and static muscular strength among Egyptian professional soccer players

Material and methods:

Subjects

Data were collected on professional players from three positional Groups (defenders, midfielders, strikers) representing various Egyptian Premier League clubs during the 2011-2012 season. The committee granted ethical approval from the EgyptianFootball Association. 42 players (14 defenders, 16 midfielders, 12 strikers) from three different teams were selected in the study. All subjects were free of any disorders known to affect bone metabolism, such as bone fractures, osteoporosis, diabetes and cardiovascular disease. The participants did not report use of any anti-seizure drugs, alcohol and cortoon consumption, neither smoking cigarette.

PROCEDURES

Age, height, weight, body mass index and Training experience were recorded. Height was assessed with a standard tape measure on a wall; weight was measured with household scales. Body mass index was calculated (BMI (kg/m^2) = Wt (kg) /(Ht $(m)^2$.

Static strength test (LS) (BS)

A Takei leg and back dynamometer was used to measure the static leg and back strength. The subjects stood on the dynamometer platform and crouched to the desired leg bend position, while strapped around the waist to the dynamometer. At a prescribed time they exerted a maximum force straight upward by extending their legs. They kept their backs straight, head erect and chest high. 3 trials were allowed to the subjects and the best score was taken. Subjects had a rest between the trials (Jensen & Fisher).

BMD measurement

Regional BMD was measured by a bone densitometer (QDR-1000®, Hologic Inc., Waltham, Massachusetts, USA) using dual-energy x-ray absorptiometry. DXA scans are used primarily to evaluate bone mineral density. DXA scans can also be used to measure total body composition and fat content with a high degree of accuracy comparable to hydrostatic weighing with a few important caveats. However, it has been suggested that, while very accurately measuring minerals and lean soft tissue (LST), DXA may provide skewed results as a result of its method of indirectly calculating fat mass by subtracting it from the LST and/or body cell mass (BCM) that DXA actually measures.The measured regions wherethe lumbar spine (L2, L3, L4) and the femoral regions of the kicking leg, neck (NECK), trochanter (TROCH), ward's triangle (WARDS). The region "lumbar spine" (L2-L4) is defined by the mean value of L2, L3 and L4; the coefficient of variation was < 1.5%.

Kicking Distance – Preferred Leg – Very basic test in which the measuring gaugesare set up to cover 6 meters. Set up a 5 meter kicking area where the tested player starts from and then measure and mark out 30 meters and every 5 meters thereafter. The player may not run any further back than the designated 5 meter area. He will have 2 kicks on his preferred leg and will score only with his best kick. Let the ball hit the ground and stand where it bounced to then gauge how far the kick traveled using the 5 meter markers.

Diagram

Statistical analysis:

All statistical analyses were calculated by the SPSS.V.16 (Statistical Package for the Social

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Sciences). The results are reported as means and standard deviations (SD). ANOVA analysis was used to compare the variety of the different variables between the three groups for static strength and regional bone. Least Significant Difference Test "LSD" was used to compare group means in variance analysis results that were found statistically significant. Differences in means were considered significant if p, 0.05

RESULTS

Table 1. Anthropometric Characteristics Training experience of the Groups (Mean ± SD)

Group	N	Age [years]	Weight [kg]	Height [cm]	BMI [kg/m^2]	Training experience
Defenders	14	25 ± 1.2	77 ± 2.9	179 ± 3.1	23.5 ± 1.8	14 ± 2.5
Midfielders	16	22 ± 0.9	70 ± 3.1	173 ± 2.2	23.3 ± 2.1	11 ± 2.3
Strikers	12	23 ± 1.4	73 ± 3.2	177 ± 2.8	23.2 ± 1.9	13 ± 1.1

Table 1 shows the age and anthropometric characteristics of the subjects. There were no significant differences were observed in the anthropometric characteristics and Training experience for the subjects in the different groups.

Table 2. Mean ± SD and Least Significant Difference Test "LSD" between three positional Groups (defenders, midfielders, strikers) in BMD, BMC (Fem Neck Troch, Wards – Tri and L2-L4) and static muscular strength for legs and back

Variables	Defenders (D)	Midfielders (M)	Strikers (S)	D-M	D-S	M-S
BMD						
Fem Neck	1.344± 0.03*	1.326± 0.04	1.324± 0.02	S	S	NS
Troch	1.123± 0.02*	1.115± 0.03	1.114± 0.04	S	S	NS
Wards – Tri	1.058± 0.02	1.051± 0.02	1.049± 0.04	NS	NS	NS
L2-L4	1.359± 0.07*	1.232± 0.04	1.240± 0.06	S	S	NS
BMC						
Fem Neck	7.451± 0.57*	7.103± 0.82	7.114± 0.73	S	S	NS
Troch	16.603± 1.02*	16.422± 1.03	16.334± 1.02	S	S	NS
Wards – Tri	1.040± 0.14*	1.035± 0.16	1.036± 0.18	S	S	NS
L2-L4	14.269± 1.04*	14.131± 1.07	14.134± 1.06	S	S	NS
Static Strength						
LS	184.36± 4.77*	180.75± 3.91	178.36± 4.23	NS	S	NS
BS	156.25± 4.53*	153.46± 3.33	151.87± 3.42	NS	S	NS
Kicking distance						
KD	35.00 ± 4.53	32.32 ± 3.15	29.87 ± 5.87	S	S	S

Table 2 shows that:

Significant Difference between Defenders group and Midfielders group in **BMD of Fem** Neck for Defenders group. Significant Difference between Defenders group and Strikers group in **BMD of Fem Neck** for Defenders group. No Significant Difference between Midfielders group and Strikers group in **BMD of Fem Neck**.

Significant Difference between Defenders group and Midfielders group in **BMD of Troch** for Defenders group. Significant Difference between Defenders group and Strikers group in **BMD of Troch** for Defenders group. No Significant Difference between Midfielders group and Strikers group in **BMD of Troch**.

No Significant Difference between all groups in **BMD of Wards – Tri**.

Significant Difference between Defenders group and Midfielders group in BMD of **L_2-L_4**for Defenders group. Significant Difference between Defenders group and Strikers group in **BMD ofL_2-L_4** for Defenders group. No Significant Difference between Midfielders group and Strikers group in **BMD of L_2-L_4**.

Significant Difference between Defenders group and Midfielders group at**BMC of Fem Neck** for Defenders group. Significant Difference between Defenders group and Strikers group at**BMC of Fem Neck** for Defenders group. No Significant Difference between Midfielders group and Strikers group at**BMC of Fem Neck**.

Significant Difference between Defenders group and Midfielders group at**BMC of Troch** for Defenders group. Significant Difference between Defenders group and Strikers group at**BMC of Troch** for Defenders group. No Significant Difference between Midfielders group and Strikers group at**BMC of Troch**.

Significant Difference between Defenders group and Midfielders group at**BMC of Wards – Tri** for Defenders group. Significant Difference between Defenders group and Strikers group at**BMC of Wards – Tri** for Defenders group. No Significant Difference between Midfielders group and Strikers group at**BMC of Wards – Tri.**

Significant Difference between Defenders group and Midfielders group at**BMC of L_2-L_4**for Defenders group. Significant Difference between Defenders group

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and Strikers group at**BMC of L_2-L_4** for Defenders group. No Significant Difference between Midfielders group and Strikers group at**BMC of L_2-L_4.**
No Significant Difference between Defenders group and Midfielders group in **LS**. Significant Difference between Defenders group and Strikers group in **LS** for Defenders group.No Significant Difference between Midfielders group and Strikers group in **LS**.
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Significant Difference between Defenders group and Midfielders group in **KD**for Defenders group. Significant Difference between Defenders group and Strikers group in **KD** for Defenders group. Significant Difference between Midfielders group and Strikers group in **KD**for Midfielders group.

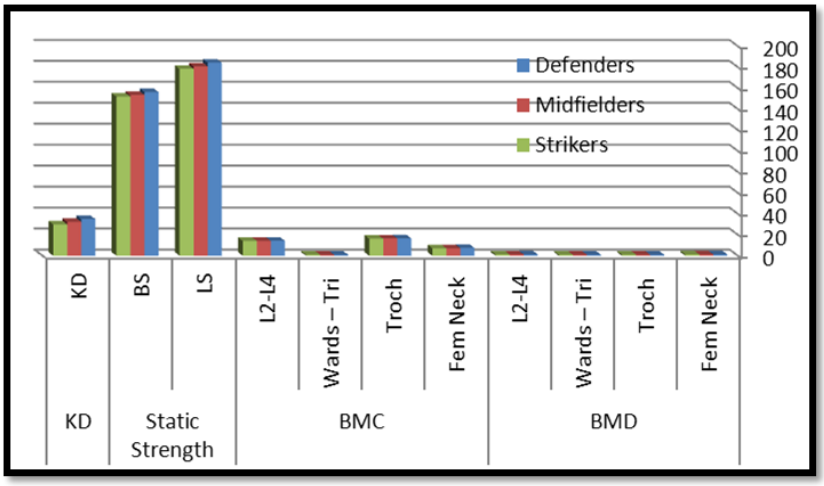

Figure 1 shows the deference's between three positional Groups (defenders, midfielders, strikers) in BMD, BMC (Fem Neck Troch, Wards – Tri and L2-L4) and static muscular strength for legs and back

Table 3.The correlation between static muscular strength inthe legs and back ,Kicking distance and BMD, BMC (Fem Neck Troch, Wards – Tri and L2-L4) .

Variables	BMD				BMC			
	Fem Neck	Troch	Wards – tri	L2-L4	Fem Neck	Troch	Wards – tri	L2-L4
LS	0.643**	0.432**	0.332*	0.421**	0.721**	0.432**	0.365*	0.535**
BS	0.507**	0.331**	0.215	0.523**	0.622**	0.541**	0.332*	0.649**
KD	0.721**	0.655**	0.209	0.786**	0.821**	0.701**	0.613**	0.879**

*R with 0.05 = 0.304
**R with 0.01 = 0.393

Table 3:shows that:

The high significant correlation between LS and BMD , BMC for Fem Neck (0.643**) (0.721**)
The high significant correlation between BS and BMD , BMC for L2-L4 (0.523**) (0.649**)
The high significant correlation between KD and BMD , BMC for L2-L4 (0.786**) (0.879**)

Table 4.The correlation between Kicking distance and static muscular strength for legs and back .

Variables	BS	LS
KD	0.752**	0.652**

Table 4:shows that:
The high significant correlation between KD and BS (0.752**

Discussion

Each sport is characterized by its unique physical and physiological demands in different age groups and positions thatare of importance to assess the elite performers to understand the demands of the sports at different stages of development

Soccer involves intermittent high-intensity activitieslike running at different intensities, suddenaccelerations and stops, rapid changes in direction,jumps, kicking and punting that result in significantground reaction forces on the skeleton. Therefore, soccer can be classified as an impact loading sport (Alfredson et al. 1995)

involvingosteogenic activities (Wittich et al. 1998). Moreover, soccer practice induces positiveadaptation of the bone tissue (Vincente-Rodriguez et al. 2004).

The results of Table (1) showeda different levels of BMD in football players according to different places to play, and this is due to that each position playing is characterized by the capabilities of its own to distinguish them from the rest of the other positions, where the defense players must be to have the ability to jump and hitting the ball by head to prevent a goal as well as their ability to conduct the tackling quickly and also their participation in the attack and the exploitation of their machine.

Midfielders and strikers also engaged in significantly more of the 'other' type movements (jumping, landing, diving, sliding, slowing down, falling and getting up) with strikers performing the most of the three positions. As identified by Bangsbo (1997), extra physiological costs are created through on the ball and other movement activities. In terms of the latter, strikers and defenders fall to the ground most in match play with defenders required to get-up quickly more times suggesting this is another area important for physical preparation.

These positions also perform the most jumping which supports the findings of Bangsbo (1994) and Reilly et al. (2003) with defenders performing significantly more backward jumping. However, it also appears to be important for midfielders to have the ability to jump vertically.

Adding to, defenders were also observed to perform significantly more diving with feet first which may be related to attempts to intercept passes or block shots and crosses rather than making tackles as there were no differences seen in the number of tackles made by all positions. Defenders may also need to be the physically strongest players as they were found to perform the most physical contact at high intensity. Efficacy in pushing and pulling activities in the upper body as well as having abilities to withstand being pushed and pulled is desirable. In addition, strikers were also observed to have higher levels of stopping at high intensity as well as swerving and slowing more rapidly. These activities produce shearing forces on the lower limbs and appropriate strength training and rehabilitation practices must be adopted and emphasized (Besier et al., 2001). In similar respect, defenders should also have sufficient body strength in order to compete with the strikers.

It is clearly also a correlation function between the distance kicking and BMD of the spine and legs and muscle strength of the spine and legs, and this explains the role of force employment in the kicks, and notes over defenders in the distance kicking and this is attributed to the defenders need to deflect the ball to the farthest possible distance from their goal compared to Attackers and midfielders.

In terms of directions travelled, the midfielders were also found to perform the most directly forward movements with defenders engaged in the highest amount of backwards and lateral movements. This is similar to previous findings of Rienzi et al. (2000). The majority of diagonal and arc movements were performed in forward directions with midfielders and strikers performing more than defenders, which suggest these, are important directions in order to manipulate and create space or to evade a marker and be in a position to receive a pass from a teammate.

In conclusion, this analysis has shown that the assessment of bone mineral density , static muscular strength and kicking distance according to field positions among soccer players has very important, and coaches Must be developed and modified their training load according to individual capacity.

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THE EFFECTS OF TEACHING PROGRAM BASED ON COGNITIVE RESEARCH TRUST STRATEGIES ON PERFORMANCE LEVELS OF SWIMMING

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Abstract

Purpose. The development of thinking skills helps in and outside the classroom. Although the main purpose of teaching De Bono thinking skills in education is to improve students' performance and achievement, such skills will also help them in the outside world. Hence, this study aimed to explore the effectiveness of training programs based on court strategies on the performance level of back swimming.
*Methods***.** (40) Undergraduate male and female, mean age 17.4 years from faculty of Physical Education Mansoura University. Divided into equally to two groups, the experimental group comprised of (20) students. The subjects in this group participated in the swimming pool in the CORT program for eight weeks; group two participated in the swimming class with traditional method (teacher instruction) as a control group. Parameters assessed the high, weight, age and academic level. And all of them were beginners (not practiced swimming sport before).
*Results***.** Results indicated that significant differences were found among the groups in the performance level of back swimming and improved significantly were found among the groups in performance levels of back swimming.
Conclusions. In conclusion, the CoRT strategies could develop the performance level of back swimming for undergraduate students
*Key words***:** CoRT program, Thinking Skills, back swimming.

Introduction

Being a successful swimmer is not just something you do in the water. It follows you everywhere you go in life. Being successful in the pool means thinking successfully out of the pool as well. It means expecting the best - of yourself and of others. It means never being satisfied with anything that is second-rate, but demanding excellence of yourself in all areas of your life. Powerful thoughts. The easiest way to be successful at anything is to become a successful person. This means thinking and behaving the way a successful person would think and behave - and this will always bring good results. When you immerse your subconscious mind into a pool of new thoughts - filled with power, strength, excellence, courage etc., it will begin to automatically steer you in the direction of success. (Craig, 2007)

Development of human thought is gaining its currency. The aim of the educational quality assurance was to enable the learners to think, analyse, create and reflect. However, it was found that the achievement in the learners' ability to think, analyse, synthesize and reflect was low or 18.74%. The percentage of learners to classify and compare information was only 26.24%. The percentage of learners to initiate, predict and determine the target was 36.75%. The root cause could be that teachers did not realize the way to develop the thinking process. Most of them based the teaching process on the subject matter; as a result, it turned out that the learners who were traditionally taught were unable to deal with the problems in a real world. (Cooper, 2010)

Through different learning and teaching activities, students acquire knowledge about the correct techniques for different swimming strokes and seek ways to improve on specific weaknesses. This cultivates their critical thinking skills. They can also use information technology such as the Internet to collect information and analyse different topics connected with swimming to report on what they have learnt. For example, they may be interested in the characteristics of the buoyancy of our body in water, the origins and development of different strokes, how to choose suitable strokes to match the individuals' physical qualities, etc.

CoRT Program is designed to teach students a set of thinking tools that allow them to get rid consciously patterns of conventional thinking and accepted, in order to see things clearer and wider and development look creative more to solve problems, and learn this program students become thinkers well and striking. It's currently used widely in the world in the courses direct teaching of thinking, where the use of more than seven million students from primary to university

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education in more than thirty countries, including the United States, Britain, Canada, Australia, New Zealand, Venezuela, Japan, Bulgaria, India, Singapore and Malaysia. (Walid, 2004):

Thinking is a process that accompanies humans permanently. Due to humans' need for it, critical thinking skill became a contemporary issue in education because the individual who has this skill is able to think independently, take right decisions and support the social, political and economic systems in his or her community (Cooper, 2010). So, the Knowledge Economy Project focused on critical thinking as one of the strategies of teaching (Eggen, & Kanchak, 2006). Generally, Social Studies curricula and History curriculum, specifically, are considered the fields that focus on critical thinking skills due to the fact that History course help the learner develop his or her critical thinking and solve problems (Zarrillo, 2003). Consequently, educational institutions took care of enriching textbooks and school curricula with critical thinking skills since this is an important part of the process of education development and as an aim among many of education quality (White, 2000).The importance of critical thinking is embodied in the individual's ability to judge, understand, apply, evaluate and compare things and study facts and organize and categorize thoughts to get to the accurate and correct solution (Segal et al., 1985). This means that critical thinking consists of many skills: inference, recognition of assumptions, deduction, interpretation and evaluation of arguments (Lefrancois, 2005). These skills need a thinking development program (Bono, 1994). And, CoRT program is considered the most frequently used programs all over the world in the contemporary time and it consists of six units: breadth, organization, interaction, creativity, information and feeling and action (Bono, 1986).

Mental skills are a rational and reflective mental act on the issues, arguments with utter prudence on the basis of knowledge, ideas and experiences in order to reach a reasonable conclusion. A Mental skill is an advanced level of exercising a mental activity based on the rational principles. It is a crucial tool in learning and leading a valuable life. Several of scholars commonly view that a critical thinking is essential to generate a maximum benefit to learners. It can be used in living a life in the present day world in a creative manner (Lohman, & Woolf, 2001). More importantly, a mental skill plays a vital role to enable a person to think creatively, act reasonably and solve problems more effectively. An ecclesiastical study combined with a formal education is conducted for the Monastic Order. The educational pattern is modeled on the curriculum designated by the Ministry of Education.

History course is taken as one of the courses that contribute in shaping the individual personality and helps in research, correct planning, criticizing, deducing, comparing and getting the lessons (Paul, 1993). Also, the study of history gives the individual the chance to acquire thinking skills, specifically, critical thinking skill (Bono, 1987). Paul emphasizes that citizenship is embodied in the citizen who has critical thinking skill especially in the age of globalization and technological advancement in which information resources are varied and this gave the importance of relating CoRT program with developing critical thinking skills (Tripp, 1980).

The initial lesson in learning the CoRT Program is to become aware of our habitual reactions and to apply the decision to stop. Once we have learned to prevent an unthinking reaction we can choose to apply a response based on reasoned judgment. Responding in this way requires us to attend to ourselves in the present moment. Stopping unthinking habits put us in the position of being able to exercise choice rather than be subservient to unchecked automatic reactions. The radical difference between our normal patterns of behaviour and the process of thinking in activity can be illustrated by the following model. In this model we see how one pathway leads to a pattern of habitual reactions which result in a 'vicious spiral' of misuse, tension and pain. Conversely, by learning to break the habit, we enter into a 'virtuous spiral' of awareness and the freedom to act in a healthy way.

It's not easy to remain constantly alert to ourselves in this way. We are creatures of habit, and not used to the idea that we can renew our self-awareness from second to second. Inevitably, we find ourselves slipping back into habitual reactions and unthinking habits. However, through the practice of the AT it becomes easier to notice the signs of misuse and to respond in an appropriate way. (Craig, 2007)

In physical education lessons, great emphasis is placed on developing the collaboration skills, communication skills, creativity and critical thinking skills. Aesthetic appreciation is also very important. For example, students can learn through physical activities to cooperate with team members and from that point develop their collaboration skills. They can learn to control their emotions when facing unfavorable situations in competitions and thus improve their ability to solve problems. Generic skills and aesthetic appreciation are best cultivated gradually through different learning and teaching activities and situations. The effects of learning and teaching can be observed and improved through different modes of assessment.

Thinking Skills are the mental processes we use to do things like: solve problems, make decisions, ask questions, make plans, pass judgments, organize information and create new ideas.

Often we're not aware of our thinking - it happens automatically - but if we take time to ponder what's going on then we can become more efficient and more creative with our minds.

Due to the importance of thinking for the community and individual, And an important goal of education is

helping students learn how to think more effectively. The demand of the necessity to include thinking skills in university curricula increased specifically History curricula as they are important in making students acquire the mental skills such as analysis, elicitation, interpretation and problem solving in a more effective way. Particularly, students, in our faculty of physical education face many lives and classroom stress that need to think to solve and know what the situation include exactly and this requires focusing hugely on developing thinking skills. Hence, this study aimed to explore the effectiveness of training programs based on CoRT strategies to develop thinking skills and performance level of back movements in swimming.

Material and methods

Participations

(40) Undergraduate male and female, mean age 17.4 years from faculty of Physical Education Mansoura University. Divided into equally to two groups, the experimental group comprised of (20) students. The subjects in this group participated in the swimming pool in the CORT program for eight weeks; group two participated in the swimming class with traditional method (teacher instruction) as a control group. Parameters assessed the high, weight, age and academic level. And all of them were beginners (not practiced swimming sport before).

All subjects were free of any disorders known to affect performance, such as bone fractures, osteoporosis, diabetes and cardiovascular disease. The participants did not report use of any anti-seizure drugs, and alcohol. And all participants were fully informed about the aims of the study, and gave their voluntary consent before participation. The measurement procedures were in agreement with the ethical human experimentation.

Instruments

Mental strategies test

Design this test each of (A. Mohamed & M. Magda 2002) using a set of reference testing in this area, in order to measure (how to use the player for some strategies mental conditions training and competition), this test contain (9) nine dimensions, namely (building Goals ,self- talk , arousal - positive thinking - control emotional - mechanism - words mood - retail performance - think of duty skill), and includes all after these dimensions on the (8) eight items - except (positive thinking) comprising the (4) Four items only measure each strategies mental conditions both competition and training, and there are statements in the direction of the dimension and the other in the opposite direction dimension, and therefore ensure the test (68) words, and respond to expressions test done on a scale of five (5) gradients (never - rarely - sometimes - often - always). The researchers has Excluding phrases conditions of competition and limit it only to phrases conditions of training to become total phrases scale (34) a. Has ranged correlation between the degree of each phrase and the overall degree of after to find a true internal consistency of the test between (.578 - .822) in the previous studies, as has been found reliability coefficient test using retail midterm by applying the test (15) players, the value of coefficient ferry link between marital and individual scale in previous studies 0.781, The researcher has to find true internal consistency of the application (20) a student from the same research community, was to find correlation coefficients between scores in each phrase with a total score of its own specified.

The back swimming skills

The participant should be comfortable with face in the water and able to:

Diving

Floating and progressive paddle stroke,

Swim 15ft

Front and back without assistance.

Stroke mechanics

Treading water

Progressive diving skills

Underwater swimming skills

Endurance.

The training program which is based on CoRT strategies:

The researchers designed a training program based on CoRT strategies. After finishing the preparations of this training program, it was referred to 14 specialized referees in the field of social studies curricula and their teaching methodology. In the light of the referee's suggestions,

Infusion across the curriculum. 'The Thinking Curriculum'

Encourage questioning, especially the use of open-ended questions

Encourage thinking aloud to help monitor reasoning and express opinions

Strategies for making group discussion purposeful and promoting a range of speaking and listening e.g. pair talk, listening triads, envoys, snowball, circle time, rainbow groups, jigsaws etc.

Independent and collaborative learning activities, which are linked to improving pupils' self-esteem, allows them to share and discuss strategies

When teachers pose oral questions 'Thinking Time' could be increased

Information and communication technologies provide logical frameworks for enhancing children's thinking, either through individual interactions with computers and multimedia or opportunities for collaborative learning through networks.

Embedding in particular subjects:

A strategy in which every teacher asks 3-5 questions for students to answer at the beginning of every lesson

to remind them of what they learned yesterday, last week 3-4 months ago or even a year ago.
Incorporate thinking skills into Personal and Social Education course from S1-S4; to ensure success staff should volunteer for the role and be interested in the approach
Swimming teaching which focus on the skills required to solve the problems rather than the answers, per se and encourage 'situated learning' i.e. the use of swimming in a real context
Collecting evidence, problem solving, analysis and interpretation are thinking skills well embedded in the teaching of History
Social Studies encourage concept development, the development of the student's vocabulary for talking about thinking
Using talks and group work for generating and evaluating alternative solutions encourages thinking skills in Geography.

Procedures:

Preparing the study tools (CoRT program and the test of mental strategies)
Referring the study tools to the referees to make sure of their viability and truth
Applying and implementing the study tools on the piloting for the calculation of stability
Conducting the pre-test of critical thinking on the subjects of the study
Conducting the study by the researcher. That is the experimental group were taught through the CoRT program and the controlling one was taught through a usual method
Conducting the post-test of critical thinking on the subjects of the study
Doing the statistical analysis and discussing the results

Statistical analysis

All statistical analyses were calculated by the SPSS statistical package. The results are reported as means and standard deviations (SD). Differences between two groups were reported as mean difference ±95% confidence intervals (meandiff ± 95% CI). Student's t-test for independent samples was used to determine the differences in mental parameters between the two groups. The $p<0.05$ was considered as statistically significant.

Results

Table 2. Mean ± SD and " T" sign. Among two groups (experimental and control) in mental strategies and performance level of swimming skills

Variables	Experimental group		Control group		T sign.
	Pre	Post	Pre	Post	
Building Goals	10.25 ±2.36	14.36±1.69	10.69 ±2.09	10.95±2.04	Sign.
self- talk	7.23±0.89	8.42±0.95	7.15±0.77	7.23±0.77	Sign.
Arousal	11.78±1.47	13.07±1.04	11.35±1.89	11.39±1.28	Sign.
Positive thinking	10.91±2.11	13.14±2.69	10.41±2.36	10.34±2.67	Sign.
Emotional control	10.25±1.69	11.39±1.68	10.59±1.77	10.62±1.99	Sign.
Mechanism	12.36±2.54	14.16±2.84	12.44±2.12	12.49±2.71	Sign.
Words mood	11.23±1.69	13.25±3.45	11.63±1.99	11.89±2.69	Sign.
Retail performance	10.68±2.63	12.41±2.45	10.77±2.78	10.78±2.24	Sign.
Think of duty skill	12.09±2.87	14.16±2.11	12.14±2.49	12.19±2.06	Sign.
Performance level of swimming skills	3.26±0.9	5.00±0.80*	3. 3±0.8	4.79±0.60*	Sign.

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Table 2 showed that.
Significant differences were found among the groups in mental strategies
Significant differences were found among the groups in back swimming level.

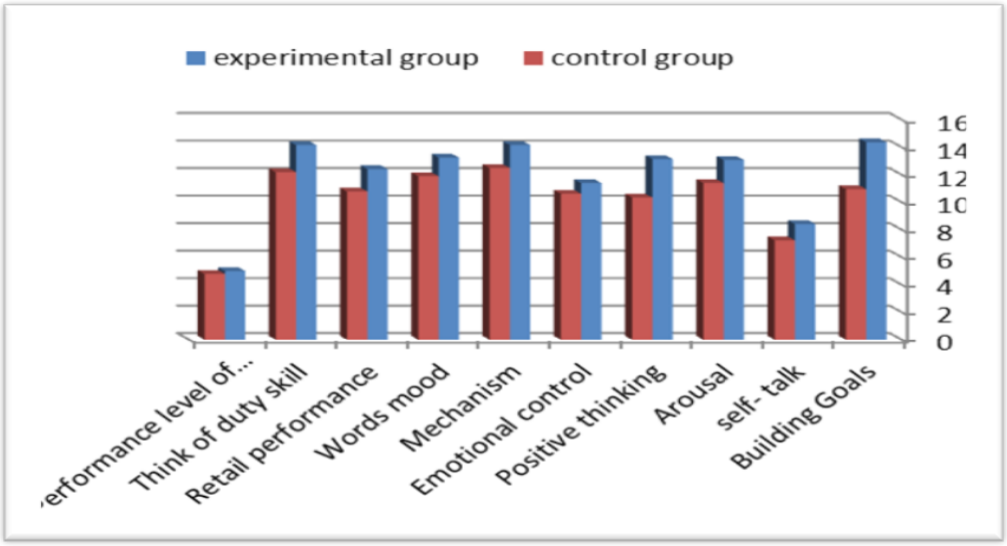

Fig. 1 explain the differences between two groups in mental strategies and the performance level of back swimming

Discussion

Based on the results of this study the t-test showed a statistically significant difference between the post measurements in the experimental group in all mental strategies factors and the performance level of back skills in swimming.

It seems to the researcher that the reasons of these results are: The accurate organization by presenting the training program might have contributed in spreading factor of suspense and draw the attention of students. The researcher noticed that during the application of the study that student showed positive reactions. History course-specially the selected unit-contains lots of difficult concepts that need to be facilitated for students to comprehend. The CoRT program might have contributed to a huge extent in clarifying these concepts and this issue might develop critical thinking skills for students. The CoRT program includes many activities which resulted in having fun, excitement and curiosity for students. The researcher's notes during the application supports this hypothesis as students showed noticeably active interaction with these activities which was reflected positively on their critical thinking. And, the researcher refers this to planning the lessons according to a CoRT based program with more focus on critical thinking skills and applying it in a classroom with more focus on the teaching method that encourages critical thinking as a method of researching and problem solving. This encourages moving students' thinking towards higher thinking skills. (Segal, et al. 1985)

Probably the easiest way to do this is to hang around successful people! For instance, if you are an excellent swimmer, it is reasonable to say that if you constantly hung around with people you would begin taking on their habits of success, and eventually your results would escalate dramatically.

Of course, you don't have to be in their company to do this; you can find out what the successful swimmers do and begin to make some of their success habits your own. They call this 'modeling success' - which (in swimming) means to copy successful swimmers of your choice and begin to take on some of their success habits which you like, or can identify with.

Another simple way to do this is to ask you regularly "how would handles this?" The chances are that if you take the option you consider they would take, then it will probably be the right one. Begin taking the powerful option, by thinking big and expecting the best.

Alexander frequently said that only by stopping the wrong can better use emerge, and in the AT great importance is attached to this principle. As the pupil progresses, understanding of what 'stopping' entails maturing and deepens. It doesn't mean doing nothing at all so that you collapse in a heap. It relates specifically to stopping the familiar, unwanted and unnecessary habits of our physical and mental responses. Only in this way can we recognize how habitual these patterns are, and be empowered to overcome them so that we can live our lives with a new and more creative awareness. (Zarrillo, 2003)

Begin also knowing from now on that YOU are in control of your own thoughts. You and only you. Always. You never need to ever get angry or frustrated again - it is all up to you what you choose to think. No-

one can ever bother you again, or make you intimidated, anxious, fearful, etc. - unless you let them. You have total control over the way you think and act - you are not at the mercy of the world, as so many people seem to think. Take back your power instead of giving it to others, and know that nothing need bother you ever again. Better still; know that it will only bother you if you allow it to bother you.

Through CoRT strategies in various forms of practices, competitions and related activities, students have opportunities to observe each other and learn to identify the aesthetic elements of fellow students' performances in different activities such as the display of different swimming strokes or synchronised swimming, reflect on them and share their views with each other. This way you remain in complete mental control - and when you control your mind, you control your body as well. The swimmer who manages their thoughts and life the best outside the pool, will probably also manages their swims best in the pool. The top swimmers have to become absolute masters at handling outside pressures such as media attention, public expectation, as well as the usual stuff like training, meets, friends etc - and this is what you need to be able to do also, in order to succeed.

The physical and psychological reinforcing stimuli that students receive are similar regardless of their gender. All of these factors did not show differences between the genders · The present study findings agree with the study (Walid, 2004) that indicted and showed the out performance of the way of learning using the CoRT program in developing critical thinking skills for the students comparing it with the standard method.

Conclusion

In conclusion, the CoRT strategies could develop the performance level of back swimming for undergraduate students

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EFFECT OF EXERCISES TO DEVELOP THE MOTOR EXPECTATION ON THE LEVEL OF SKILL PERFORMANCE OF THE SITTING VOLLEYBALL PLAYERS

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Abstract
Purpose. Identify the effect of exercises to develop the motor expectation on the level of skill performance (set, spiking, block, serve, and defense) for sitting volleyball players.
Methods. The researcher used the experimental method by designing two groups; one is experimental, and the other is control. The sample included 12 physically disabled volleyball players, the researcher used physical and skill tests and the tachistoscope to measure the speed of motor expectation.
Results. There was significant differences between the experimental and control groups in the post-test of the skill variables and motor expectation in favor of the experimental group.
Conclusions. These results have to be taken into account by coaches in order to develop the Motor Expectation for sitting volleyball players In order to improve skill performance level
Key words: Motor expectation, skill performance level, sitting volleyball.

Introduction

The care of the disabled and concern for them in the twenty-first century is no longer a humanly duty like before, but it is a legitimate right for this category of people whose destiny decided by fate to be on this case. The criterion of nation's development has become associated with the services provided to them, and provided all the ways and means that will help to integrate with normal society. The sitting volleyball is one of the sporting activities practiced by a large number of disabled because it is a recreational and competitive activity disabled finds in practicing it achieving self-esteem through his/her integration with others and getting the best results with the development of his/her achievements.(Amgad, 1999).Care for the disabled is one of the indicators by which the progress of countries is measured, out of their belief that the disabled person has rights on the society and that these rights make of him a positive and effective element, where the disabled persons are classified into four main categories: persons with physical disabilities, persons with intellectual disabilities, persons with sensorial disabilities, and persons with social disabilities.(Mahmoud, Adnan,1995).Sitting volleyball is a sport in which the disabled and the able bodied can play together at a high technical level and, as such, it represents a good opportunity for integration .Among advantages of sitting volleyball is also that a large scale of disabled youth and adults of both sexes can take an active part in that game.. An exception would be when a short loss of contact with the court is permitted when playing the ball, excluding the service, the block and the attack hit, when the ball is absolutely higher than the top of the net. To stand up, raise the body or take steps is forbidden by the rules. To sit and play on the floor is basic to sitting volleyball. The height of the net follows the idea of sitting requirement. Moving on the floor could be practiced the rough various activities like maneuvering in different directions on the court, playing small games in sitting position, and orienting similar exercises. Sitting position is the key issue for any further development and progress in play. Players in sitting volleyball game use hands for moving around and if the nature of disability allows also their feet. (Rajko, 2009).The motor expectation is one of the characteristics, participating in motor building for the player. The expectation is expressed in form that the individual is ready for the following movement before the first movement begins.(Osama,1994,Amrel Allah,1994,.Amgad, 1995).The basic skills of sitting volleyball is a group of movements that player must perform from a seated position on and off the court as permitted by the law of the game with minimal effort to achieve the best results.(.Amgad, 1999).The researcher noted through his experience as a local and an international coach of sitting volleyball players to that, there is a lack in the mental preparation for sitting volleyball players in general and motor expectation

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training, in particular, which reflected negatively on the level of skill performance of the players. The researcher, hither, inspired the idea of the study to prepare training for developing motor expectation and recognize its effect on the level of skill performance of sitting volleyball players. The researcher formulated the following hypotheses to verify the objectives of the study:

- There are statistically significant differences between the pre and post-tests of both experimental and control groups in the variables of motor expectation and skill performance level in favor of post-test.
- There are statistically significant differences between both experimental and control groups in the variables of motor expectation and skill performance level in favor of the experimental group.

Method

The researcher used experimental method by designing two groups; one of them is experimental, and the other is control.

Sample was intentionally selected from sitting volleyball players form Al-Hourria Club for people with disabilities in Port Said and registered in the records of the Egyptian Federation for the disabled sports, season 2012/2013. Their number was 12 players divided randomly into two experimental and control groups. The researcher conducted the process of homogeneity and equivalence on the variables of chronological age, training age, weight, motor expectation, the level of physical, and skill performance. Table (1) indicates that skew coefficient values confined ± 3, suggesting the moderation of distribution data for these variables and the homogeneity of the sample. Table (2) also indicates that there are no statistically significant differences between the experimental and control groups in the previous variables where the Mann-Whitney calculated values U for are greater than tabular value U indicating that both groups are equivalent.

Table (1): Statistical characterization of the study sample in the variables of chronological age, training age,

Variables		Measure Unit	Arithmetic Mean	M	SD	Skew coefficient
Chronological age		Year	27.6	27.5	1.13	0.26
Training Age		Year	5.8	5.7	2.60	0.11
Weight		Kg	78.40	77.82	0.77	2.25
Motor Expectation		To 0.01 sec	0.3215	0.3200	0.1231	0.036
Physical Variables	The strength of right hand grip	Kg	50.60	51.10	3.60	-0.41
	The strength of left hand grip	Kg	49.25	48.20	2.55	1.23
	Throwing a three- kg medical ball with right hand	Meter	4.50	4.45	1.11	0.13
	Throwing a three- kg medical ball with left hand	Meter	4.11	4.14	0.50	-0.18
	Sit-Up	Number	28.45	28.40	0.90	0.16
	Running forward for 10 M.	Second	4.75	4.82	1.40	-0.15
	Running to the right side for 10 M.	Second	4.49	4.45	2.22	0.05
	Running to the left side for 10 M.	Second	4.37	4.30	3.50	0.06
Skill Variables	Serving accuracy	Degree	8.17	8.11	1.17	0.15
	Setting accuracy	Degree	8.25	8.29	1.35	-0.08
	Block accuracy	Degree	8.19	8.10	2.16	0.12
	Spiking accuracy	Degree	8.14	8.12	0.15	0.4
	defense accuracy	Degree	8.35	8.30	0.75	0.2

Weight, motor expectation

n = 12

Table (2): The significant differences between both experimental and control groups in the variables under study

n1 = n2 = 6

Variables	Rank Sum		Rank Values		Mann Whitney Calculated Value U
	Exp.	Con.	Exp.	Con.	
Chronological age	42	36	15	21	15
Training Age	44.50	33.50	12.5	23.50	12.50
Weight	34	44	23	13	13
Motor Expectation	32	46	25	11	11
The strength of right hand grip	43.50	34.50	13.50	22.50	13.50

The strength of left hand grip	43	35	14	22	14
Throwing a three- kg medical ball with right hand	45	33	12	24	12
Throwing a three- kg medical ball with left hand	32.50	45.50	24.50	11.50	11.50
Sit-Up	32	46	25	11	11
Running forward for 10 M.	71	7	14	22	14
Running to the right side for 10 M.	10.50	67.50	24.50	11.50	11.50
Running to the left side for 10 M.	6	72	21	15	15
Serving accuracy	68	10	11	25	11
Setting accuracy	6.5	71.50	20.5	15.5	15.50
Block accuracy	69	9	12	24	12
Spiking accuracy	71	7	14	22	14
Defense accuracy	32	46	25	11	11

Tabular value U at 0.05 = 8

Data collection Tools

Physical and skill tests appropriate for sitting volleyball players were identified through Literature review of related studies and scientific references. .(.Amgad, 1999 , .Amgad, 1995, Helmi, F.Laila, 1998) Those tests have high validity and reliability coefficients.(.Moustafa,1998, .Moustafa, 1992)

A- Physical Tests:

Dynamometer to measure the grip force

Throwing a medical ball to the farthest distance to measure the muscle ability.

Sit-Up to measure force endurance.

Sitting forward and side running to measure speed.

B- Skill Tests:

Serving accuracy

Block accuracy

Setting accuracy

Defense accuracy

Spiking accuracy

C- The researcher used tachistoscope to measure the speed of motor expectation. He used it in the related studies (Adel, .Ahmed, 2007, .Suleiman, 2001). which has high validity and reliability coefficients

The Bases of Developing Motor Expectation Training:

The researcher identified the time and content of motor expectation training through the literature review for related studies and scientific literature. (Moustafa,1998, Adel, Ahmed, 2007, , A.Moustafa, 1992, F.Suleiman, 2001)The researcher found that the number of training modules on the motor expectation in one week should be four training modules, and the number of weeks training should be 8 weeks. The total training units in the entire program are 32 training units. The time of one training unit is 90 to 120 sec, while the time of motor expectation exercises are 30 to 40 sec in the part of skill preparation. The program has been applied to the experimental group rather the control one which only used skill training. Post-tests were conducted on both experimental and control groups from 20/06/2012 to 27/06/2012. The program was applied to the experimental group from 05/07/2012 to 05/09/2012, while the post-tests were applied from 08/09/2012 to 15/09/2012.

Statistical Treatments:

The researcher used the following statistical treatments (mean, median, and standard deviation, skewness) to test the significant differences between the two groups of Mann-Whitney and Wilcoxon Signed Ranks Test to calculate the significant differences between pre and post-tests for one group.

Table (3): Temporal distribution of physical preparation and public sectors and skill and tactical preparation and Motor Expectation Exercises Over the weeks training program

Stages and weeks	General Preparation			Special preparation					Preparation matches				Total
Aspects Preparation	1	2	3	4	5	6	7	8	9	10	11	12	
Total physical preparation	287	249	210	189	147	126	105	84	63	66	66	61	1653
The preparation of a general physical	258	199	147	113	73	50	32	16	7	0	0	0	895
Prepare a special physical	28	50	63	76	73	76	73	67	56	66	66	60	754
Skill preparation	84	124	147	126	168	168	147	147	147	132	132	102	1624
motor expectation Exercises	25	30	45	45	64	64	54	54	53	46	46	30	556

Tactical preparation	40	42	63	84	105	126	168	189	210	242	242	246	1757
Total training time	722	694	675	633	630	610	579	557	536	552	552	499	7218

Table :(4) Forms of exercise used in the training unit:

Drill no	name	Purpose of drill	Number of athletes	Description	Progressions
1	Ball Control Shuttle	Warm-Up/ Movement/ Ball Control	Groups 4	-Athletes line up in two lines facing each other about 2m apart -Continuously tossing the ball back and forth they follow the ball with different sides, switching lines, so everyone must think where the ball come next time. Variations: -Underhand tossing and overhead tossing -Athletes toss laterally to partner so partner has to move side to side	-One line remains catching and tossing, other line progresses to overhead passing -Both lines progress to overhead passing and then forearm passing
2	Triangle Drill	Movement/ Ball Control	Groups 4	- Athlete starts in centre of triangle and moves to one corner about 1.5m away, catches a ball and tosses back to partner who will call him as a signal from coach before he call him. - Athlete returns to the centre, catches a ball and tosses it back to partner then goes to next corner and repeats.	-Athlete overhead/ forearm passes each contact back to partner. -Athlete passes each contact with either left or right arm.
3	W-Passing	Movement/ Ball Control	Groups of 3 or 4	-Athlete starts on sideline and catches tossed ball and passes back to coach. -Then moves back to the second point, catches and tosses back to coach and then does the same for all five points of the in different places.	-Two balls at each point – once athlete plays first ball, toss a second, lower ball to them right away. Athlete catches and tosses both and then moves to next point. -Use overhead or forearm contacts at each point. -Two contacts at each point using overhead or forearm Contacts.
4	Partner Passing with Lateral Movement	Movement/ Ball Control/ Expectation	Partners	-Partners face each other Through the net on the net cover to hide another side and pass the ball Continuously back and forth When playing the ball back to partner, focus and put the ball to one side or another of partner	-Have partner play first ball to self and then hit down ball To partner on each side.
5	Star Drill	Movement/ Ball Control/ Expectation	3-4 per group	-Player starts in middle of court and goes to sideline to play ball After playing ball, athlete moves back to middle and plays ball then goes to deep to play ball - Athlete plays ball on all sidelines and corners as he expectation the coach will make pass for him.	-Have athlete play two balls at each spot on the court Have athlete dive on stomach or on back at each spot on court and then recover and play ball.

					-Target at net can progress to setting outside hitters to transition.
6	Four-Corner Defense	Movement/ Ball Control/ Attacking/ Expectation	6	-Athletes position themselves one on each corner of court and one athlete in the middle court another side. -Athlete in the middle sets athlete on one corner who will attack directly on the side he will move to it cross court All athletes attacking converge cross court and prepare to defend attack - After digging attacked ball to athlete in the middle, corner athletes must reset to respective corner and athlete in the middle sets another corner	Athlete in the middle (setter) can set to themselves before setting corner to slow the drill down in the beginning .
7	Continuous Dig-Set	Movement/ Ball Control/ Attacking/ Transition/ Expectation	6	-Three athletes line up behind each other in position 5 and three athletes line up behind each other in position1. Coach at net in position 4 and assistant. Coach in position 2. -Ball is initiated by coach in position 2 tossing free ball to position 5 -Position 5 athlete passes ball to position 1 athlete (middle of the court) who sets it to position 4 and follows ball to position 4. -Position 4 attacks ball back to position 1 where next player in line has filled in (attacking athlete in position 4 then follows ball to position 1) -Position 1 passes to position 5, who sets position 2 and follows ball -Cycle repeats continuously with attackers always following ball and defenders only following ball to attack positions once they set.	Each time change the direction of the ball back from the coach and the other time assistant coach and the side.
8	Serve to Catch Defense	Ball Contact/Attacking / Expectation	6	-Athletes line up in position 1 (server), position 3 (setter), position 4 (attacker) -Server in position 5 serves down the line to passer in position 5 -Rally plays out and position 4 attacks at position (1 , 6 , 5) who comes into court after serving in	-Add blockers with changes side he will block for it -Serve and receive cross-court or down opposite line
9	Partner Attacking Sequence	2nd Ball Contact/ Attacking/ Attack Recovery/ Expectation	2-4	-One athlete in position 2, one athlete in position 4 at net blocking. -Coach tosses ball to position that passes it to position 4 who sets back to position 2 to attack. -As soon as position 4 sets ball, coach tosses ball to them and they pass to position 2 who recovers from the attack and sets back to position 4 to attack. -blocker moving as he expectation the attacker moving and side attack. -Once position 2 sets ball, coach tosses to them and cycle restarts.	Have attackers perform blocking movements between attacking and receiving free ball from coach (set –block – pass – attack).
10	Serve	Serve	6	-Three serve receivers, one setter and	- Add blockers on

Receive with Immediate Return	Receive/2nd Ball Contact/Attacking /Attack Recovery / Expectation	one attacker on one side and 2-3 servers on opposing side -Serve to receiving side and play rally out. -As soon as ball is attacked, coach tosses in fast free-ball to be transitioned -Challenge attacking side to recover quickly after attack.	serving side -Coach can introduce ball to blockers to quick attack -back at receivers for the second contact

Results

A- Verifying the first hypothesis that there are statistically significant differences between the pre and post-test of both experimental and control groups in the variables under study in favor of the post-test:

Table (5): The significant Differences between the pre and post-tests of both experimental and control groups in the variables under study:

		Experimental Group n = 6					Control Group n = 6				
Variables		Rank Sum		Rank Values		Wilcoxon Calculated Value W	Rank Sum		Rank Values		Wilcoxon Calculated Value W
		+		+			+		+		
kinetic Expectation		6	Zero	21	Zero	*Zero	2	4	2	19	2
Skill Variables	Serve	6	Zero	21	Zero	*Zero	6	Zero	21	Zero	*Zero
	Set	6	Zero	21	Zero	*Zero	6	Zero	21	Zero	*Zero
	Block	6	Zero	21	Zero	*Zero	6	Zero	21	Zero	*Zero
	Spiking	6	Zero	21	Zero	*Zero	6	Zero	21	Zero	*Zero
	defense	6	Zero	21	Zero	*Zero	6	Zero	21	Zero	*Zero

* Wilcoxon tabular value W at 0.05 = zero

B- Verifying the second hypothesis that there are statistically significant differences between both experimental and control groups of the post-test in the variables under study in favor of the experimental group:

Table (6): The significant differences between both experimental and control groups in the post-test for the variables under study:

n1 = n2 = 6

Variables	Rank Sum		Rank Values		Mann Whitney Tabular Value U
	Exp.	Con.	Exp.	Con.	
kinetic Expectation	60	18	3	33	*3
Serve	65	16	5	31	*5
Set	59.5	18.5	3.5	32.5	*3.5
Block	54	24	3	33	*3
Spiking	52	26	5	31	*5
defense	52.5	25.5	4.5	31.5	*4.5

*Tabular value U at 0.05 = 8

Discussion

Table (5) indicates that there are statistically significant difference between the pre and post-tests of the experimental group in the variables of skill and kinetic expectation in favor of the post-test. The tabular value W equals the calculated values W for Wilcoxon. The researcher attributed that the positive effect of kinetic expectation exercises on improving the players'

skill performance level and kinetic expectation. These results are consistent with the results of studies, which indicated that the program and kinetic expectation exercises help to develop the level of skill performance and improve the expectation.. (Amgad, 1999, Amgad, 1995, Moustafa,1998, Moustafa, 1992, Adel, Ahmed, 2007, Suleiman, 2001)

Table (5) also indicates that there are statistically significant differences between the pre and post-tests of the control group in the skill variables only. The researcher attributed that improvement despite its slightness to the traditional training, which has a positive effect on the level of skill performance of the control group players in the variable of motor expectation. This is due to that the control group is not subject to motor expectation exercises.

B- Discussion of the second hypothesis results:

Table (6) indicates that there are statistically significant differences between both experimental and control groups in the post-test of the variables of skill performance level and the motor expectation in favor of the experimental group where the U value is tabular. The researcher attributed that to the positive effect of motor expectation exercises, which helped players to think fast and have the ability to change tempo, motor, and spatial expectation. Furthermore, what expectation training has enjoyed of exciting, fun, challenge and get rid of the boredom in the traditional training program, which reflected positively on the level of skill performance of players (spiking, setting, defense, block, serve).

Conclusion

This is consistent with what researcher referred that motor expectation exercises help to develop the level of skill performance of the players through the development of quick thinking and quick action appropriate for motor timing through the analysis of the properties of competitor's intellectual building and predict his attempts in special situations. As well as being aware of his/her skill performance level led to perform a certain type of movements. (F.Suleiman, 2001)

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ACUTE EXERCISE-INDUCED MUSCULAR DAMAGE AFTER ONE MONTH TRAINING IN SOCCER PLAYERS

NIMA GHARAHDAGHI[1], MOHAMMAD REZA KORDI[1], FATEMEH SHABKHIZ[1]

Abstract
Purpose. The purpose of this study was to examine the effects of high intensity aerobic interval training on muscle damage markers after exhaustive maximal exercise.
Methods. Twelve soccer players performed soccer special training for 4 weeks. Before that they participated in one session exhaustive exercise in pre and post soccer special training. Blood collection was conducted in rest and exhaustion time for CPK and LDH serum level measurement.
Results. Our results showed all indicators of muscle damage changed significantly after both bouts. Based on that, significant differences between rest times and exhaustion times were evident for CPK and LDH serum level after both exhaustive exercises. Compared to the first bout, CPK and LDH levels resulted in significantly smaller changes after the second exercise bout in post high intensity aerobic intervaltraining.
Conclusion. The decline in CPK level from pre and post exhaustive exercise (rest and exhaustion time) value between bout 1 and 2 were 31% and 30%, respectively. These values for LDH level were 12% and 23%, respectively. These results suggest that 4 weeks of high intensity aerobic interval training caused significant decrease in muscle damage markers in rest and exhaustion time in soccer players.
Keywords: Muscle Damage, CPK, LDH, Hoff training, soccer players.

Introduction

During a soccer match, among various factors, physiological, technical, and tactical skills are important for optimal performance (Hoff et al., 2002). Given the soccer characteristic, during a soccer match (90 min) this game has been classified as an high intensity and intermittent sport (Mosey, 2009)and many players ordinarily run a distance between 10-12 kilometers in an intensity near to anaerobic threshold (80-90 % of maximum heart rate or 70-80 % of maximal oxygen consumption (VO_{2max}))(Mcmillan et al., 2005).

When the activity is performed in high intensity and for long time, oxygen deficiency could cause organic abnormalities or ischemia. It has proved that intense exercise will increase free radicals and simultaneously reduce antioxidant activities, by which inflammation and muscular damage will occur.

In addition intense exercises such as exhaustive exercises cause oxidative stress by which muscular damages and progressive increase in free radicals. It is reported that there is a direct relationship between rate of muscular damage and high intensity exercises, that is, the higher activity, the higher muscular damages. It has been proved that creatine phosphokinase (CPK) and lactate dehydrogenase (LDH) serum level are related to muscular and cartilage damage and inflammation (Han, Kim, 2011).

CPK in plasma could be known as none- natural stress syndrome in muscles. Untrained athletes immediately after high intensity activities, have higher blood CPK level than trained athletes. It has been reported that as CPK and LNH are as indirect indicators of muscular damages, they could be used to determine rate of effect in a training plan (Han, Kim, 2011).

Accordingly, one session of exhaustive exercise after a training period, is a very suitable sample to measure effect of oxidative stress on the body. As declared, intra muscular LDH or CPK in the blood circulation shows the fiber damage, which is created via oxygen deficiency, or mechanical damage. It is proved that trained athletes showed less increase in the serum levels of these enzymes after strenuous activity (Bhagat et al., 2006).

Therefore, the objective of this study was to investigate the effect of high intensity aerobic interval training on changes in indices of muscle damage in soccer players.

Materials and methods

Subjects

Twelve male soccer players from third Iranian divisions participated in this study after being informed about the aims, experimental protocol, procedures and after delivering writing consents. At the time of the experiments, the players were in the preparation period of the season, performing 3-4 training sessions per week. Their mean (±SD) age, height, weight and percent body fat were 21.88±2.24 yrs, 174.22±5.33 cm, 67.77±5.7 kg, and 12.38±3.29 percent, respectively.

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Experimental procedures

All subjects were recommended to get enough sleep the day before the measurement, and the objective and plan of the study were also fully presented. In addition, general adaptation training for the test equipment was implemented, and the O2 intake method was also introduced. The subject's VO_{2max} was assessed during a graded exercise treadmill (HP Cosmos Mercury Med 4.0) test using standard Bruce protocol (Bruce et al.,1973) in the morning hours. The test was terminated when subjects stated they could no longer continue with the maximum workload. At the terminal workload, all subjects had to meet at least two of the following criteria for a valid test: 1- a final respiratory exchange ratio (RER) > 1.0, 2- O2 consumption increased by < 2 ml·kg^{-1} with an increase in exercise intensity, 3- attainment of >85% of age-predicted maximal heart rate (Vatansever-Ozen et al, 2011).

Blood collection (10 cc) was conducted from the ante brachial vein under stable conditions using a syringe. Further, blood collection was carried out four times: before and after exhaustive exercise in pre and post high intensity aerobic intermittent training. The collected blood was stored in blood plasma tubes treated with the anti-coagulant EDTA and centrifuged at 2500 rpm for 15 minutes. Tubes were stored at -80℃ until measurement. On the following days, players performed high intensity aerobic interval training sessions (figure1).

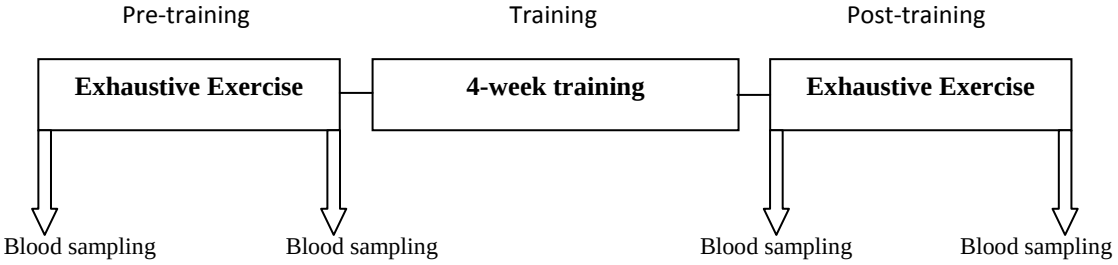

Figure1. Experimental design.

Training Intervention (Hoff training)

The aerobic training intervention consisted of interval training, comprising four bouts of 4 min work periods dribbling a soccer ball around a specially designed track (Hoff et al., 2002) (figure 2) on soccer field. Training cones used in the dribbling circuit were 0.3 m high and 0.15 m wide. Hurdle height was set at 0.5 m.

Working intensity was at 90–95% of each player's maximum heart beat, with work periods separated by 3 min of jogging at 70% of HR max.

All players wore a Polar Team System heart rate belt and monitor (Polar Electro) throughout the interval training. The interval training was performed three times a week at the end of the soccer training session, on the same days and time of day throughout the intervention period.

No emphasis was placed on improving strength, sprinting, or jumping performance throughout the intervention period. The 4-week intervention period was carried out directly after the off-season intermission period, encompassing the 4-week preseason preparation period.

Statistical Analysis

For data processing, the SPSS 18.0 program was used to calculate the average and standard deviation for each treatment item. One-way repeated measurement ANOVA and Paired Student's t-test applied to verify the differences in the pre-Hoff protocol and post-Hoff protocol. T

he post-hoc test for the groups was implemented using a least significant difference (LSD) method. Further, the significance level for verification of the hypothesis was set at $p<0.05$.

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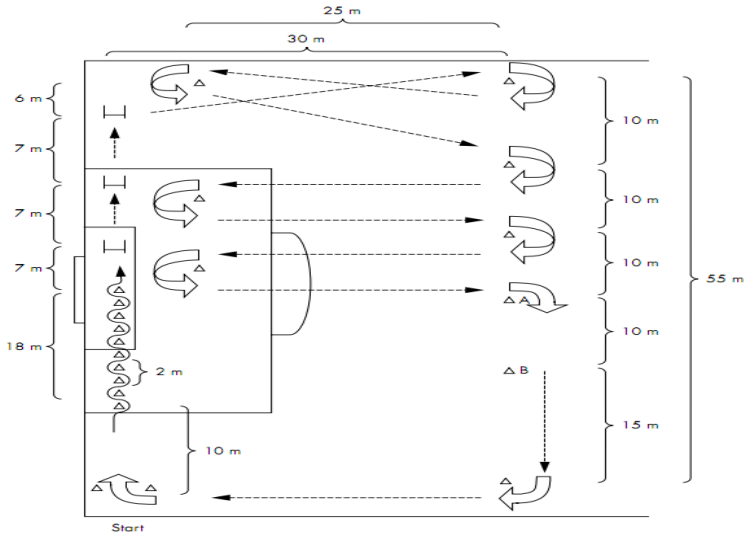

Figure2. Soccer specific dribbling track used for high intensity interval training sessions. Players dribble a soccer ball around the track, lift the soccer ball over the hurdles, and jump over the hurdles. Players dribble backwards with the soccer ball between points A and B.

Results

Changes in aerobic power

The 4 weeks aerobic training intervention manifested significant improvements in Vo_{2max} (table 1) of 5.5% ($p<0.05$). The mean Vo_{2max} increased from 49.14±4.65 to 51.87±5.13 $ml.kg^{-1}.min^{-1}$. Mean body mass was unchanged after the intervention period.

Table1. Changes in VO_{2max} in soccer players.

Variable	pre-Hoff training	post-Hoff training	p value
VO_{2max} $(ml.kg^{-1}.min^{-1})$	49.14 ± 4.65	51.87 ± 5.13	0.01*

Changes in CPK

Table 2 represents the results of the ANOVA. As shown in Table1, the values of plasma CPK in soccer players increased immediately after performing exercise. The values in pre and post exhaustion time decreased after the 4-week training (figure3).

Table2. Changes in plasma CPK in soccer players.

	pre-Hoff training		post-Hoff training	
CPK (IU/l)	pre-exhaustion	post-exhaustion	pre-exhaustion	post-exhaustion
	193.66±121.57	234.33±136.44*	132.5±56.05**	163.58±62.28*,**

* Significant difference between pre and post exhaustion. ** Significant difference between pre and post Hoff training.

Changes in LDH

As shown in Table 3, the values of plasma LDH increased after exhaustion but decreased after 4-week training in the group (figure 4).

Table3. Changes in plasma LDH in soccer players.

	pre-Hoff training		post-Hoff training	
LDH (IU/l)	pre-exhaustion	post-exhaustion	pre-exhaustion	post-exhaustion
	164.16±27.83	220.16±52.5*	144.16±24.01**	168.33±25.39*,**

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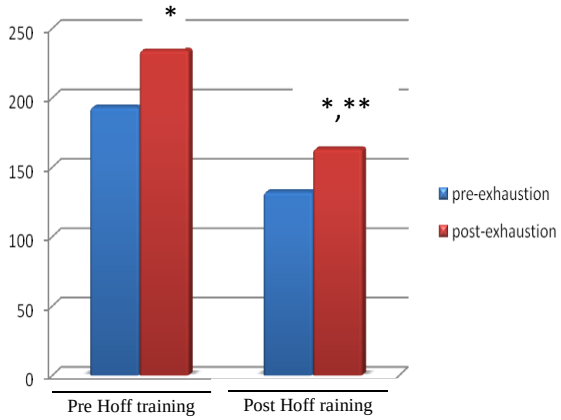

Figure3. Changes in plasma CPK before (pre) and immediately after (post) exhaustion in 12 soccer players. *P＜0.05.

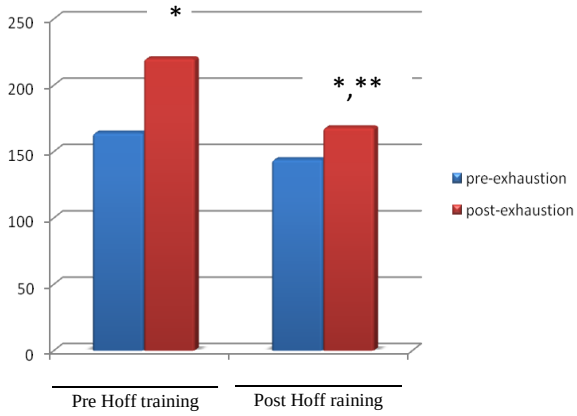

Figure4. Changes in plasma LDH before (pre) and immediately after (post) exhaustion in 12 soccer players. *P＜0.05.

Discussion

Our study proved that 4 weeks of high intensity aerobic interval training with ball caused meaningful reduction of serum LDH level in rest (12%) and exhaustion time (23%). It is means serum level of LDH in the rest time in Pre-Hoff training moved down from 164. 16 to 144.16 IU/l in post- Hoff training.

Meanwhile in exhaustion time, serum levels of LDH moved down from 220.16 to 168.33 IU/l. As to CPK, the meaningful reduction was 30 and 31% for rest and exhaustion periods, respectively. That is in rest time, serum levels of CPK moved down from 193.66 IU/l (before Hoff training) to 132.5 IU/l (after Hoff training).

Meanwhile in exhaustion time, serum levels of CPK moved down from 234.33 to 163.58 IU/l. Irrespective of all restrictions and given the obtained results, probably Hoff training have been able to effect on the serum levels of CPK and LDH in rest and exhaustion time.

Meanwhile parallel to our results, other researches reported that after a exhaustive exercise, exercise causes release of the enzymes in serum (Atland et al., 1964; Czuba et al., 2011, Fowler et al., 1962, Miyama, Nosaka, 2004). As it is proved in present study, one exhaustive exercise is a suitable sample to scale oxidative stress effect on the body and accordingly it was shown that after long high intensity training, trained athletes have less increase in levels of CPK and LDH (Bhagat et.al, 2006).

Present findings are according to that of Fowler et al(1962), Atland et al(1964). They reported that after exhaustive exercise increase in muscular damage markers enzymes in untrained athletes was higher than trained peers. On the other hand, according to the study it was declared that 12 weeks of intensive training as 8 min pedaling on the cycle could not have meaningful effect on the level of serum CPK and LDH. Probably the reason of fail to effect in training ,as these authors declared ,is that duration is more effective in cellular compatibilities driven by muscular damage than exercise intensity and it could be announced that kind of applied protocol can be affect the resulting output (Bhagat et a.l, 2006).

Accordingly it has been stated that CPK release is mainly related to exercise duration and there is a correlation 0.97 between CPK and LDH (Kim et al., 2007).

Thus given the theories in relation to intensity and duration of exercise we could interpret then as follows: As stated, there is a direct relationship between muscular damages markers and exercise duration and intensity (Han et al., 2011, Kim et al., 2007) and in this respect, Hoff training had relatively long duration (4 min) and high intensity (90-95 % maximum heart rate). Of course the mentioned training included eccentric activities such as running, jumping and backward running which everyone of them only cause increase of muscular damage markers in blood (Magalhaes et al, 2010).

Thus, one session of Hoff training could move up LDH and CPK levels in serum as strenuous activities. On the other hand according to studies, it was proved that frequent eccentric activities in some sessions and as more specialized repeat of running in downward in 6 weeks could move down increase of levels LDH and CPK (Byrnes et al., 1985). Given the results and

specifications of Hoff training, it is expected that if these training were repeated, this training likely will reduce the increase of muscular damage markers releases in blood after a session of exhaustive activity. Thus, our results parallel to this theory that repeat of long high intensity eccentric activities could reduce the increase of LDH and CPK levels in serum.

On the other hand, in this study coincided with increase in VO_{2max} (5.5%) from 49.14 to 51.87 $ml.kg^{-1}.min^{-1}$, soccer players showed increase in muscle damage markers. Our findings are in tune with those of previous studies, who also found that Untrained athletes immediately after high intensity activities and exhaustive exercises, have higher blood CPK and LDH levels than trained athletes (Atland et al., 1964; Han et al., 2011).

The main restriction in our study which likely effects on the obtained results in levels of muscular damage markers is that in relation to these variables from control group, blood sampling neglected and the results were reported only based on pre and post Hoff training data.

However, it is evident that the results should be interpreted cautiously, but based on available data no study had measured Hoff training effect on muscular damage markers and this study can be a start point for future researches, so control group will be applied and different protocol length be tested.

Conclusions

In summary, the present study demonstrated that 4 weeks of high intensity aerobic interval training caused significant decrease in muscle damage markers in rest and exhaustion time in soccer players and it was coincided with increase in their aerobic power.

Acknowledgement

Researchers of the present study seize this opportunity to express their thanks to all dears who have established necessary cooperation in fulfilling this research. We deem it necessary to express our special thanks to Mrs. Rafiei and Mr. Azarboo for their unsparing efforts and supports. Also, we express our thanks to the assistances made by the Research Deputy Office of Physical Education Faculty of the University of Tehran for fulfilling the present study as "research project".

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ACUTE EFFECT OF WHOLE BODY VIBRATION ON RUNNING GAIT IN MARATHON RUNNERS

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Abstract

The Aim Of The Research. The present study aimed to create an experimental model that uses high frequency mechanical vibration to quantify the decline of performance, without running 42195m (distance of marathon race), and clarify the alterations in kinematics parameters in marathon runners. The hypothesis is that these vibrations will produce an alteration on the running gait. For this reason we studied the kinematics of the footstep in marathon runners before and after a session of 10' mechanical whole body vibration (WBV).

Methods. Fifteen male marathon runners performed on a treadmill at Iso-Efficiency Speed, with and without WBV (10 min at 50Hz – 2 mm. with a 1':1' work to relief ratio). A digital camera Hi-Speed (210 Hz) for motion recording was used to perform video analysis and heart rate was measured. The follow parameters were analysed: step length (SL), flight time (FT), step frequency (SF), contact time (CT), heart rate (HR) and the internal work (W_{INT}).

Results. Two-way analysis of variance (ANOVA) revealed that: SL decreased ~4% ($p < 0.0001$) and SF increased ~4% ($p < 0,0001$). FT decreased ~7,2% ($p < 0,001$) whereas CT remained constant. This effect occurred during the first minute: SL decreased ~3,5% ($p < 0,001$) and SF increased ~3,3% ($p < 0,001$), while during the second minute SL decreased ~1,2% ($p = 0,017$); SF increased ~1.1% ($p < 0,02$). From the third minute onwards, there was a return to the pre-vibration condition. The W_{INT} increased by ~4% ($p < 0,0001$) and there was an effect on the HR of ~1.5% ($p < 0,0001$).

Conclusions. This study have proposed an experimental approach for determining the alteration which occurs due to WBV not only on cyclic neuromuscular patterns but also on the running kinematics of marathon runners, where these variations have an effect on the internal work and heart rate. Despite the potential benefits of vibration training, it is essential that the implications of this type of treatment needs to be acquired prior to its use in sport setting. Ten minutes of WBV was able to produce a similar alteration of the running kinematics as well as marathon race, and the exact mechanisms remain to be elucidated.

Key Words: Whole Body Vibration, Running Gait, Iso-Efficiency Speed, Internal Work, Motor Control.

Introduction

Among all sports events, the marathon race is a competition with a special fascination and has been extensively studied by scientists (Padulo et al., 2011; Padulo et al., 2012b). The researchers' goal was to analytically understand the mechanisms that underlie this sport performance (Padulo et al., 2011). In fact, interesting research has elucidated that after a marathon race there is an increase of step frequency and a reduction in step length. In both variables the percentage difference was ~4% between the start and finish of the marathon race (Hausswirth, Bigard, Guezennec, 1997; Kyrolainen et al., 2000). This reduction in step length is also associated with a significant reduction of muscular activity by electromyography (EMG) of the vastus lateralis, gastrocnemius, and soleus after the marathon, compared to the pre-marathon condition (Avela et al., 1999).

The main factor that determines the reduction of EMG activity and the mechanical parameters is muscle fatigue (Bakhtiary, Safavi-Farokhi, Minian-Far, 2007). In fact, the soleus and gastrocnemius have the important role of allowing plantar flexion (Kyrolainen et al., 2000) and are used intensively in the marathon race. On average, the number of steps taken by the elite athletes is about 28000 while for amateur runners it is about 52000 (Padulo et al., 2011). The reduction of the biomechanical variables (step length) also occur during the half-marathon (Meardon, Hamill, Derrick, 2011) and in shorter competitions, like the 5000m (Girard et al., 2011), where the velocities are higher than those of the marathon and half-marathon. Unfortunately, the only way to quantify the efficiency and any reductions of the athletes' performance is to run a marathon (~3 hours).

Over the last decade, research that uses mechanical vibration (Annino et al., 2007; Di Giminiani et al., 2010) for affecting EMG of the lower limbs muscles, including the vastus lateralis, the soleus, and

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gastrocnemius has emerged (Torvinen et al., 2002). In sport, mechanical vibration is used for training purposes. The effects of different vibration protocol depend on various neural facilitatory and inhibitory mechanisms, and on cellular and molecular changes in the muscle fibers (Pietrangelo et al., 2009). WBV tasks generate neuromuscular, metabolic and hormonal responses, significant changes in several motor variables (Issurin, 2005).

WBV is a potentially quick method for increasing power performance than traditional training. Optimal acute effects can be attained using as little as 30 seconds of WBV, and they are highest from 1 to 5 minutes post-treatment. Additionally, high frequencies were most effective when applied in conjunction with high displacements (Adams et al., 2009). Furthermore, mechanical vibration <45 Hz (Cochrane D.J., 2011) may create conditions of muscle fatigue (Torvinen et al., 2002) like those encountered after an endurance race. The present study aimed to create an experimental model that uses high frequency mechanical vibration to quantify the decline of performance, without running 42195m (distance of marathon race), so as to clarify the alterations in kinematics parameters in marathon runners. The hypothesis is that these vibrations will produce an alteration on the running gait. For this reason we studied the kinematics of the footstep in marathon runners before and after a session of 10' mechanical whole body vibration (WBV) at 50 Hz.

Methods

Fifteen male marathon runners (age 41.06±3.71 years; body mass 67.44±3.55 kg; body height 172±3.42 cm; BMI 22.84±1.35 kg/m^2, training background of 8±0.12 years and who had covered 131±2.78 kilometres per week last year with personal best marathon race ~2h 48' participated in this study). The subjects were healthy without any muscular, neurological and tendineous injuries and did not report any consumption of drugs. After being informed of the procedures, methods, benefits and possible risks involved in the study, each subject reviewed and signed an informed consent form prior to participation in the study, in accordance with the ethical standards.

Testing was carried out in a Human Performance Laboratory. All the participants were in good health at the time of the study. Research reported a high correlation (r= 0.93) between over-ground and treadmill running for biomechanical analysis (Riley et al., 2008). Within this study, in order to better standardize the slope and the velocity (Padulo et al., 2011; Padulo et al., 2012a), tests were performed on a motorized treadmill (Run Race Technogym® Run 500, Italy).

All participants wore marathon-running shoes and performed a standardized 10 minutes warm-up, which consisted of running at 9 km·h^{-1} to familiarize themselves with the treadmill. A randomized crossover study was administrated and the procedure followed by each participant was: 10 minutes of warm-up 5 min of standardized active muscular stretching, 2' passive recovery, 5 minutes running (T1), 2' passive recovery, one set on vibration device (sham condition or WBV) (V1), 2' passive recovery, 5 minutes running (randomised T2 or T3), 2' passive recovery, one set of vibration treatment (WBV or sham condition) (V2), 2' passive recovery and 5 minutes running (cross-randomised T3 or T2). The sequence (V1 and V2) was randomized across participants with a Latin square design (Fig. 1).

To evaluate the effect of the condition fatigue (squat position without vibration) and the reliability of the measures, each participant was tested at Iso-Efficiency Speed (IES) (Padulo et al., 2012b) in two occasions (Test – Retest). Each test consisted of 5 minutes running at IES on a 0% slope. The IES for each participant was calculated as the average speed during the participant's best performance in a 10000m race (recorded within the six month period, prior to testing) minus 1 km·h^{-1} in agreement with other studies (Padulo et al., 2012b).

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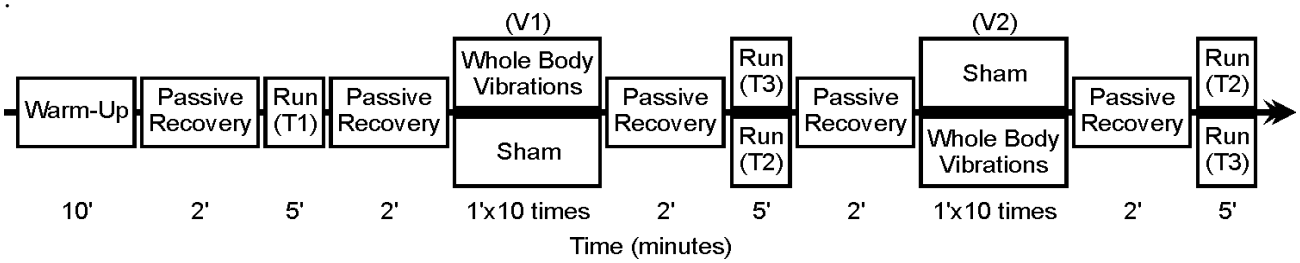

The vibration platform used for the study was: Power Plate pro5^{TM} UK (PP). As demonstrated from other studies (Pel et al., 2009), the vibration frequency (50 Hz), peak-to-peak displacement (2.2 mm) and peak acceleration ~0.9 g (~9.81 m·s^{-2}) in PP showed a good reliability for the measures (ratio 1.0) between unloaded and loaded vibration, allowing replication of the study (Rauch et al., 2010). For the WBV, ten bouts of 60s vertical sinusoidal vibrations at 50 Hz (according to the manufactures instructions) with a 1:1 work to relief ratio were used. The WBV was performed with the heels raised 5 cm off the platform, the knee at 90° flexion and leaning slightly forward, with their hands on the vibration plate's handle to support their upper body. The sham condition was performed using the same protocol without vibration.

Two-dimensional (2D) video data were collected while the participants' running on the treadmill using a single high speed digital camera (Casio FH20) sampled at 210 Hz and collected in accordance with a previous study protocol (Padulo et al., 2011). The camera was positioned on a 1.5 m high tripod, 6 m from the participant and was located perpendicular to the plane of motion at the participant's sagittal plane (Belli et al., 1992). The film sequences were analyzed off-line using Kinovea^{TM} 0.8.15 motion analysis software. The following kinematic variables were studied: (i) contact time (ms), (ii) flight time (ms), (iii) step length (meter), (iv) step frequency (Hz); for each velocity 150 steps were sampled for frequency calculation (Padulo et al., 2011; Padulo et al., 2012a; Padulo et al., 2012b).

Kinematic markers were taped on both feet of each participant. Since the velocity of the treadmill was known, both step length (SL) and step frequency (SF) could be calculated (Padulo et al., 2012a). The contact time (CT) and flight time (FT) were calculated by counting the frames in contact and flight on the 2D data, then dividing by the sampling rate, 210 (1 frame = 210 Hz ≈ 0.0048 sec). The CT and FT were calculated for both the left and right foot. The CT was defined and calculated as the time between initial contact with the ground and the last frame of contact before toe-off. The FT was defined and calculated as the time between toe-off and subsequent initial contact of the contralateral foot. Initial contact and toe-off were visually detected. In accordance with previous studies (Padulo et al., 2011) SF was calculated as: SF= [1000/(CT+FT)]; alternatively SL was calculated with the following equation: SL= (speed km·h^{-1}/3.6/SF).

The internal work (W_{INT}) was also calculated with the formula (Equation 1) proposed by Nardello et al.. (Nardello, Ardigo, Minetti, 2011)

$$W_{INT} = SF \cdot v \cdot (1+(DF \cdot (1-DF)^{-1})^2) \cdot q \qquad (1)$$

Where SF is the step frequency (Hz), *v* is the velocity (m·s^{-1}), DF is the duty factor i.e. deflection of the duration of stride period when each foot is on the ground (%) and *q* value of 0.08 referring to the inertial properties of the oscillating limbs.

The heart rate (HR) was recorded throughout the experiment and an average computed during the full five minutes for each condition (Sport Tester PE 3000; Polar Electro, Kempele, Finland). The HR was expressed in percentage of maximum theoretical heart rate (HR_{max}) by Equation 2 (Miller, Wallace, Eggert, 1993).

$$HR_{MAXTheo} = 271 - (0.85 \times age) \qquad (2)$$

The results are expressed as mean ± *SD*. The variables investigated were: Contact Time (CT), Flight Time (FT), Step Length (SL), Step Frequency (SF), Internal Work (W_{INT}), Heart Rate (HR) and the Percentage of Heart Rate with respect to the maximal theoretical heart rate (HR%). The effect size was calculated for all variables between pre and post-testing. The thresholds for small, moderate, and large effects were 0.20, 0.50, and 0.80, respectively. Assumption of normality was verified using the Shapiro-Wilk W. Test, after that, on the variables CT, FT, HR and HR% a one-way analysis of variance (ANOVA) with repeated measures was used to compare responses in each variable across the three tests (T1, T2 and T3). Moreover, on SL and SF a two-way analysis of variance (ANOVA) was carried out with repeated measures adding Assessment Time as a second factor, with five levels (1<5 min), to investigate the changes over time. For this analysis we were not interested in the main factor Assessment Time but in the interaction Test × Assessment Time. When a global difference over time was determined, *Bonferroni* post hoc analysis was used to identify where changes occurred. Statistical analysis was performed using SPSS 16.0 software. The level set for significance was $p \leq 0.05$.

Results

All participants completed the study without any objective side-effects. Neither subjective adverse reactions nor exhaustive fatigue were reported after the vibration bout. Most of the participants reported that the whole body vibration was "stimulating" for the lower extremities. The results are reported in the Table 1. The CT of the feet on the ground did not change significantly even though is decreased $F_{(2,30)}=2.792$, $p = 0.077$ (small effect) while the FT decreased significantly $F_{(2,30)}=21.629$, $p < 0.0001$ with a large effect.

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Table 1. Effects among tests

Variables	Mean (SD)			Δ%			$p^{\wedge 2}$
	T1	T2	T3	T2/T1	T3/T1	T3/T2	
Step Length (m)	1.351 (0.102)	1.352 (0.098)	1.299 (0.103)	0.074%	-4.003%*	-4.08%*	0.834
Step Frequency (Hz)	3.047 (0.121)	3.046 (0.126)	3.17 (0.137)	-0.033%	3.88%*	3.912%*	0.813
Contact Time (ms)	194 (14)	195 (14)	191 (16)	0.513%	-1.57%	-2.094%	0.157
Flight Time (ms)	134 (16)	134 (16)	125 (17)	0%	-7.2%*	-7.2%*	0.590
Internal Work (J/(kg*m))	2.043 (0.191)	2.042 (0.199)	2.124 (0.196)	-0.049%	3.965%*	4.016%*	0.812
Hart Rate (bpm^{-1})	156 (10)	157 (10)	159 (10)	0.637%*	1.923%*	1.274%*	0.510
Hart Rate (%max)	66 (4.05)	66.6 (4.09)	67.4 (4.13)	0.901%*	2.077%*	1.187%*	0.484

Mean and standard deviation (SD) with perceptual difference (Δ% and significant * $p < 0.05$) between tests and effect size ($p^{\wedge 2}$)

The W_{INT} increase after vibrations $F_{(2,30)}=64.662$, $p < 0.0001$ (large effect), as well as the HR frequency increased over the three tests $F_{(2,30)}=15.818$, $p < 0.0001$ (moderate effect). We obtained the same result by calculating the percentage of the HR_{max} of each participant $F_{(2,30)}=15.623$, $p < 0.0001$ (moderate effect). The main effect of Test was found significant for the SL $F_{(2,30)}=9.183$, $p < 0.001$ (moderate effect) (Table 1) and the interaction Test × Assessment Time $F_{(8,120)}=47.322$, $p < 0.0001$ (moderate effect). Pair wise comparisons showed that the vibrations reduced the effect in the first minute (Δ% between T3 and T1 -3.456%, and Δ% between T3 and T2 -3.379%), and also in the second minute (Δ% between T3 and T2 -1.053%).

While the trend analysis of the SF showed a significant difference among the three tests $F_{(2,30)}=9.76$, $p < 0.001$ (moderate effect) (Table 1). Pair wise comparisons showed an increment of the SF after vibrations and a significant interaction of Test × Assessment Time $F_{(8,120)}=53.701$, $p < 0.0001$ (moderate effect). Pair wise comparisons showed that the vibrations had an effect in the first minute (Δ% between T3 and T1 3.258%, and Δ% between T3 and T2 3.227%) and in the second minute in (Δ% between T3 and T2 1.259%).

Discussions

This study investigated the acute effects of mechanical vibrations in marathon runners and found a significant decrease of the running step length while the step frequency increased at post-vibrations. The experimental model used (crossover) allowed not to use a control group. Indeed, the test retest (T1, T2) performed by all participants did not reveal any significant difference for all variables. The only significant differences observed were for HR and HR%, however, the differences were very low, i.e. around 1 $beat \cdot min^{-1}$.

Analysis of the pre-and post WBV data showed a reduction of step length ~4% (Fig. 2), and a corresponding increase of the step frequency of ~4% (Fig. 2) and these changes occurred at a constant speed. Obviously, decreasing the step length also decreases the flight time of ~7.2%. (Fig. 2), whereas, the contact time remained constant (Fig. 2). By analyzing these parameters minute by minute, it was observed that this effect occurred principally in the first minute (step length decreased ~3.5%, step frequency increased ~3.3%) and in the second minute of running (step length decreased ~1.2%; step frequency increased ~1.1%). From the third minute onwards, this gap returned to the pre-vibration conditions.

These results are in agreement with our hypothesis: that 10 minutes of whole body vibrations (with 1min:1min work to relief ratio) at 50 Hz produce an alteration of the running kinematics. The results are in line with what occurs during endurance races like the marathon (Hausswirth et al., 1997; Kyrolainen et al., 2000). In athletes of good level, running the marathon at nearly constant velocity for about ~2h30'a decrease in the step length of ~4% has been observed (Hausswirth et al., 1997; Kyrolainen et al., 2000). Indeed, during the endurance races, while maintaining a constant speed the athletes reduced the stride time as a result of fatigue (Meardon et al., 2011). The factor that the marathon and mechanical vibration have in common is the alteration of the running kinematics even if it is induced by different factors.

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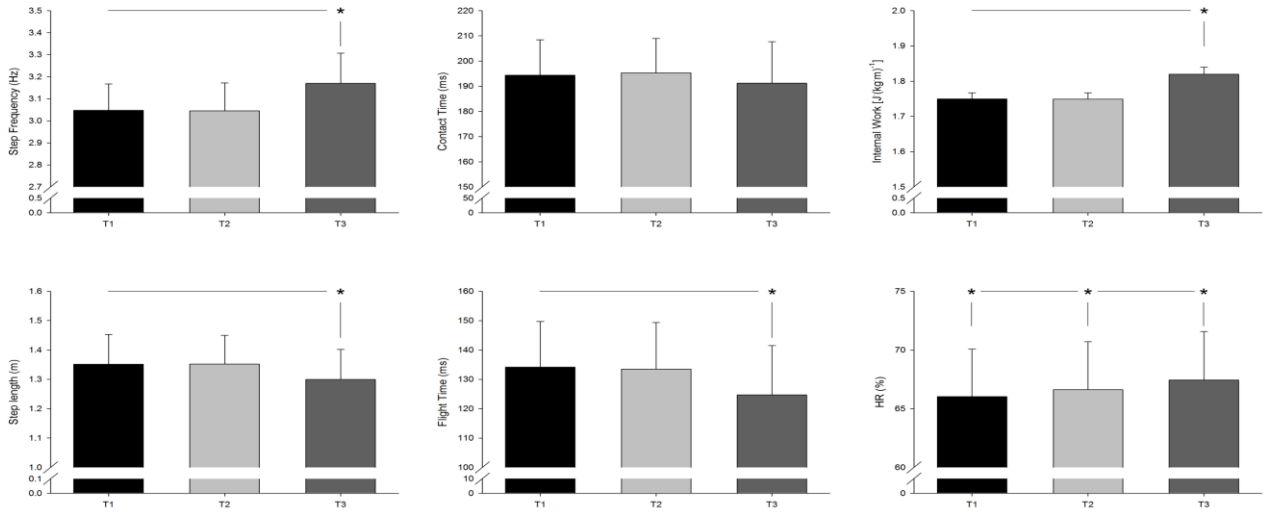

Figure 2 Average of the kinematic variables over the three tests (T1, T2 and T3). Histograms represent mean ± inter-subject standard deviation. *Significant difference (two-tails paired *t*-test, $p < 0.05$).

During the marathon, the muscle fatigue mainly depends on the depletion of muscle glycogen (Callow, Morton, Guppy, 1986) and the decrease of neuromuscular response (Kyrolainen et al., 2000). Indeed, the EMG activity of muscles involved in plantar flexion show a decrease in signal amplitude of the soleus, gastrocnemius, and vastus lateralis (Avela et al., 1999). The WBV can generate a fatigue without the depletion of muscle glycogen and influence the EMG activity of the lower limbs muscles, among which the vastus lateralis, soleus and gastrocnemius (Torvinen et al., 2002).

Furthermore, the WBV can generate an increased blood flow in the muscles undergoing vibration (Kerschan-Schindl et al., 2001). Therefore, in different ways we could obtain a neuro-physiological alteration of the muscles, as in the marathon race (Bosco et al., 1999; Cardinale & Bosco, 2003). The effects produced by the marathon race or by the vibrations are transient: as regards the vibrations we observe the recovery of the running kinematic pattern equal to the pre-test after 4 minutes (two minutes break plus two minutes running).

The hypothesis about this rapid remission of the effects of vibrations, could be related to the temporary effects on central motor command. Where vibration stimulus is capable of generating kinaesthetic illusion (Naito et al., 2000), at spinal level, through the inhibition of the antagonist muscle (via Ia inhibitory neurons) there is an alteration of the inter-muscular coordination patterns causing a decrease of muscular strength (Romaiguere et al., 1991). Probably the duration of these effects that continue for several minutes, after vibration exposure (Roll et al., 1980), in a cyclic movement like running at constant speed, as in this study, is no longer apparent after 3 minutes when the physiological neuromuscular conditions are restored.

Moreover, it cannot be excluded that WBV could lead to an alteration of the neuro-muscular properties of the type II fibres because 10 minutes of intermittent vibrations are not able to induce fatigue in those of the type I. In support of this consideration, previous studies have observed the acute effects of WBV in participants practicing strength/power sports which require a prevalence of type II fibre performance (Kofotolis et al., 2005). The WBV, like the marathon race, changes the running kinematic, but also influences the internal work, increasing the step frequency by around 4% and also the internal work by about ~4% (Fig. 2).

Although, a certain variability of the running kinematics is physiological (Hausswirth et al., 1997) and decreases during the race, it may be possible to find the best trade off between the length and frequency of the steps in order to reduce the stress of the tissues (Kyrolainen et al., 2000). Unmonitored, these changes may become a limiting factor of the performance, because if the stride frequency gets too high, the internal work (Hausswirth et al., 1997) and the energy expenditure to maintain a constant speed also increase.

Conclusions

In conclusion, this study have proposed an experimental approach for determining the alteration which occurs due to WBV not only on cyclic neuromuscular patterns but also on the running kinematics of marathon runners, where these variations have an effect on the internal work and heart rate. Despite the potential benefits of vibration training, it is essential that the implications of this type of treatment needs to be acquired prior to its use in athletic situations. Future research should be done with the aim of understanding the biological effects of different protocols on muscle performance.

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EXPERIMENTAL APPROACH REGARDING INVESTIGATION LEVEL OF GENERAL PHYSICAL TRAINING FOR TENNIS PLAYERS AGED 13 TO 14 YEARS

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Abstract
Purpose.Evolution sports performance in general and tennis in particular, has led to a great deal of domain experts to conclude that physical training has an important place in training athletes. Purpose was testing a target group and later to achieve implementation of new principles for achieving general physical training and developing models suscceptibile to be individualized for the main dimensions of the physicl demands with the introduction of novelty in the balance physical training.
*Methods.*Tests were conducted on a group of eight advanced tennis players aged 13-14 years, engaged in the sport performance of 5 to 8 years, using a number of measurements, samples and tests used by the Romanian Tennis Federation.
As results we found that scattering is very high in some tests, because the group is not homogeneous, coefficient of variability values indicating this, but we have many tests that indicate a scattering medium homogeneous or homogeneous group.
*Conclusion***.**Specific research effort playing tennis dimensions allows us to conclude that the most important physical qualities are those that are involved with the technical and tactical importance for increasing the efficiency of game players and become operational targets teaching or instructional objectives.
Key words: motor skills, sport performance, evaluation, tennis.

Introduction

Tennis became a sport in which executions of high technical skill levels are not enough to ensure success. Dynamic game of tennis requires a great general physical training, condition for ensuring consistency of performance that must be addressed to somatic features of the body and specific effort. Their variety is found in the actual game on court, and how to adapt and apply them in concrete terms of the game depends on individual characteristics of the players. "(...) From a technical and tactical point of view, good game, nice and valuable, of the big winners is the creation of their unique personalities, some genuine talents who manage to turn any action in virtuoso performance in terms of sports"(Moise, Moise , 1999).
Driving education concept in tennis is given by its presence as one of the main specific objectives of the educational process (Bollettieri,1999). What is of particular interest in terms of methodological knowledge for the game of tennis is the size indices of other driving qualities, what changes they undergo and the relation between them (Cristea, Nastase, 1979). Driving qualities defined by some authors qualities of movements, were studied in human motor capacity analysis. Sport, regardless which, usually requires all four basic motor skills: speed, strength, endurance and skill (Dragnea et. al., 2006), but in different proportions. Coordination, agility, speed and power are considered by most tennis coaches as the most important components that players should focus their training efforts. These are followed by resistance, flexibility, strength, response time and dynamic balance.
Optimizing indexes manifestation of the physical qualities necessary if we want the players to get faster, to withstand long periods of time, be agile to easily execute those "breakings of pace" to reach the ball or surprise opponent by technical and tactical unexpected executions. The only way that can stimulate quality improvements necessary for a player to become better is the subject of strength and power training.
Either they are better trained or have a genetic endowment; top tennis players are becoming more robust and powerful. As a result, the game become faster and can now be said that it is characterized by a marked and permanent aggression in hitting the ball. Base line game became a real battle to win control of the point in order to complete a more advanced position in the field. Without proper physical training, getting in best position to the ball and hitting the ball as you may need cannot be successful.
Current players, the ATP top ranked, are almost perfect athletes with a well illustrated and smooth muscles, with higher indexes of speed, stamina, strength, skills and specific qualities necessary to tennis game.
These superior indexes of driving factors qualities of tennis players, lead to a spectacular sport that delight us for many years now.
Preliminary experimental approach motivation
Strength or fast display of strength is a factor in

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making quick movements. During training and matches, their duration and environmental factors (temperature, wind and rain) can vary greatly. To overcome these factors, players must improve their strength, so that increased muscle strength of muscle contraction to be able to accelerate growth and rapid performance of an item or technique and at the same time will also increase resistance and mental toughness.

The lack of authentic information on operational strategies focused on continued growth of fitness.

One of the experiences was participating as a coordinator coach at the European Team Championships under 14 years of age, and we concluded that the potential of Romanian players exists, but the difference between us, Romanians, and European tennis great forces is made only at mental level.

Also we are looking forward to implementation of new principles for achieving general fitness training and developing models susceptible to be individualized for the main dimensions of physical demands.

Novelty of the research

This experimental approach is part of the author's forthcoming doctoral thesis entitled "Contributions to optimize general physical preparation (GPP) of tennis players, aged 13-14 years", and that will bring the novelty balanced introduction to physical preparation of tennis players in the operational models future workouts.

Material and Methods

The aim of experimental investigations:

Rethinking and restructuring strategies instruments in accordance with the characteristics and trends of the game played in the most important tennis competitions, promote thinking by objectives in achieving physical training.

Objectives

In this research we aimed to achieve the following major objectives:

• Presenting performance tennis player profile and game design;
• Study of the structure of the game driving and functional applications to identify distinct dimensions of GPP ;
• Establish specific physical playing tennis skills to be educated in the experimental group;
• Establish working group;
• Measuring and testing general physical preparation - initial phase.

Assumptions experimental investigations

1. If we rethink and restructure the physical dimensions as structural benchmarks game model practiced by high performance tennis players aged 13-14, then we can accurately determine training objectives of specific physical training and sports performances increase.
2. Based on a new sports training model will improve the game model and performance tennis player model at the age of 13-14 years.

Target group

In order to verify the level of tennis players motor qualities development we have opted for athletes of School Sports Club - Sports High School Constanta, prepared by Professor Ene Nicusor, coach Daniel Dragu and the author Liviu Panait.

The group is composed of eight tennis players aged 13-14 years, engaged in the business performance of 5-8 years, advanced athletes, who participated in a relatively large number of official competitions.

Methods of investigation used

1. Method of bibliographic information
2. Observation method - observation ITF (International Tennis Federation) sheet

In the organization of this study we have started from the observation sheet of global talented players developed by International Tennis Federation (ITF) that, personally, we have adapted it to the needs of mainstream athletes. This sheet can be used both in the training lessons and test matches and in official competitions. From all ITF adapted observation data, we were interested in physical factors only as shown in Table 1.

Table 1. Athletes observation sheet

Player name: _____Date of birth:_____
Coach name: _____Club or school:_____
Evaluation date: _____
1 = week, 2 = sub average, 3 = average, 4 = good, 5 = excelent

Physical factors (where possible, based on tests)					
Coordination	1	2	3	4	5
Speed reaction	1	2	3	4	5
Speed repetition	1	2	3	4	5
Agility	1	2	3	4	5
Power	1	2	3	4	5
Strenght	1	2	3	4	5
Balance	1	2	3	4	5
Mobility	1	2	3	4	5

Resistance	1	2	3	4	5
Speed (general)	1	2	3	4	5
Speed (tennis specific)	1	2	3	4	5
Throw	1	2	3	4	5
Catch	1	2	3	4	5
Vision	1	2	3	4	5
Total physical evaluation	**1**	**2**	**3**	**4**	**5**

3. Method of control samples and standards

For this method we have chosen a number of measurements, samples and tests used by the Romanian Tennis Federation in evaluating athletes, trials and tests which include:

Vameval test - is a field test that assesses maximal aerobic capacity (VO2max) and maximal aerobic speed (VAM or vVO2max);

Speed (5m, 10m, and 20m) – a test that looks at the travel speed on short distances of 5 m, 10 m and 20 m;

Squat jump (cm) - test seeks to assess explosive strength in the legs. Recorded jump (height) is performed using "OPTOJUMP Next". Starting position is standing with feet shoulder-width apart, knees flexed at 90 ° (to be maintained this position one second before jumping) and hands on hips;

Counter movement jump (cm) - proof follows evaluating explosive elastic power in the legs. Recorded jump is performed using "OPTOJUMP Next". Starting position is standing with feet shoulder-width apart and hands on hips. Athlete is doing a semi-flexible then performs a high jump;

Free jump (cm) - the test aims at assessing the elastic explosive strength in the legs. Recorded jump is performed using "OPTOJUMP Next". Athlete is performing a high jump from standing position, semi-flexible, without requiring a starting position or other movement. Hands can help to execute a jump as high as athlete can;

60" plyometric (cm) - test seeks to assess the resistance force of the legs. Athlete must carry for 1 minute as many jumps bound (free jump). Recorded jump is performed using "OPTOJUMP Next" and calculates total power and maintain or decrease power rate throughout the minute it takes to sample;

Right hand strength (kg) and left hand strength (kg) – both tests are aiming to assess muscle strength in the hands with dynamometer;

Abdomen strength (rep) - test seeks to assess abdominal muscle strength. Lying on the ground with the feet bended but still on the ground, and hands on the chest, the athlete needs to perform during one minute, as many lifting of the torso to an angle of 90 °. The return of the trunk is carried out until the shoulders hit the ground;

Reaction time (sec) – the test uses TReactionCO program to measure simple and complex reaction time, using a software and a suitable keyboard. At the end of each test, the program displays the results and calculates the arithmetic mean, maximum and minimum value;

Hexagon (sec) - test seeks to assess speed and agility, and the ability of the athlete to start, stop and balance in a series of very fast moves on short distances, starting and comeback in all directions of travel. The hexagon is made of six sides of 61 cm and an angle of 120 ° between them. The athlete has to jump outside each side of the hexagon and return immediately, every time at start point;

Speed endurance 6 x 20 + 20m (%) - test 6 x 20 + 20 meters, is a field test easy to apply and interpret, which aims to evaluate the anaerobic lactacid capacity. Materials needed: roulette, chalk, and clock. Measure and design two lines at a distance of 20 meters. Athletes have to be equipped with appropriate footwear field (hard or clay) which shall be identified, so that the adhesion to the ground to be optimal. Run the test: after a specific heating prior athlete must complete the race distance of 20 m, roundtrip. This is repeated six times, pause between repetitions is 20″;

Added step (sec) - test aims at assessing the added step movement speed and the ability to stop and change direction. Athlete is starting from the middle of the base line, facing the net, running a race with added step to the line corridor that reaches with the foot and then as fast as possible with same added steps to the opposite lane line and return to the starting point;

Fan (sec) - trial aims to evaluate specific travel speed of tennis game, coordination and the ability to accelerate and stop, in different directions and positions. The athlete must sprint to gather and sit at a starting point, each of the five balls on the land;

Back mobility (cm) - from standing with feet together and peaks at the edge test device (digital avant flexometre), the athlete achieves a maximum forward bending of the spine to maintain this position for three seconds;

Right shoulder mobility (degrees) and left shoulder mobility (degrees) - starting position for this tests: athlete supine with the upper limb in abduction to 90° (the whole test) on the arm forearm flexion to 90°, elbow support outside surface. Action: athlete running internal and external rotation of the shoulder, shoulder blade remaining attached to the supporting surface. Is measured using the goniometer, cumulative, the entire range of motion. The amplitude of motion can be assessed as follows: 160 ° - 170 ° very well, 150 ° - 160 ° good, below 150 ° insufficient;

Forward throw (m) - trial runs with 3 kg medicine ball and aims at assessing the strength of throwing the ball with two hands overhead;

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Forehand (m) and backhand (m) – test trial runs with 3 kg medicine ball and watches the ball roll force evaluation with two hands: from both sides of the body (forehand and backhand).

4. Method of analysis and interpretation of results
Tests values recorded population survey was characterized by estimating central tendency, embodied in statistical parameters as mean and standard deviation, given by the expression M±DS. Then the coefficient of variability was calculated and noted with CV%.

Hypothesys
If we rethink and restructure the physical dimensions as structural benchmarks game model practiced by high performance tennis players aged 13 to 14 years, then we can accurately determine training objectives specific physical training and sports performances increase.
Based on a new sports training model we will improve the game model and model performance tennis player at the age of 13-14 years.

Results

Note that all tests were given on the same day and were ultimately very tiring. As shown in Table 2, scattering is very high in some tests because the group is not homogeneous, coefficient of variation values indicating this, but we have many tests that indicate a scattering medium homogeneous or homogeneous group. Thus, the first test of the experimental group recorded a mean M±DS = 13.50±1.603 km / h, the sample was quite difficult, athletes must run in conditions where you have to be careful at the beep tone and the space that allows continue running. The results of coefficient of variation for speed test (sprint) of 5m, 10m, and 20m, show that they are a homogenous group - a great variability.
For jumping test we can observe coefficients of variability indicating a very good homogeneity as CMJ test with CV% = 9.875, and samples with good homogeneity like SQJ with CV% = 13.512, FJ with CV% = 14.734, or 60"plyometric with CV% = 12.945. Strength tests show that athletes are less homogeneous which indicates less attention in the preparation of training in these skills driving. Note that test abdomen group is characterized by the coefficient of variation to be very weak.In the specific speed tests AS and F, those with changes of direction, the experiment group succeeds very good homogeneity values. Back mobility test shows some figures on which to reflect. An average M ± SD = 1.412 ±1.016 and a CV% = 71.954 reveals a very low cohesiveness.
Last tests (AI, FH, BK), the throw tests, reveals a weak muscle training at arms and uniformity of the group is very poor.

Table 2. Initial Testing

Masculine subjects

n=8

Tests (unit)	M±DS	CV %
Vameval test (km/h)	13,500±1,603	11,874
Speed 5 m (sec)	1,242±0,027	2,173
Speed 10 m (sec)	2,120±0,057	2,688
Speed 20 m (sec)	3,618±0,201	5,555
Squat jump (cm)	24,325±3,287	13,512
Counter movement jump (cm)	25,650±2,533	9,875
Free jump (cm)	31,375±4,623	14,734
60" plyometric (cm)	18,563±2,403	12,945
Right hand strength (kg)	30,960±6,208	20,051
Left hand strength (kg)	28,125±7,518	26,730
Abdomen strength (rep)	44,500±17,151	38,541
Reaction time (sec)	447,25±38,358	8,576
Hexagon (sec)	10,462±2,321	22,185
Speed endurance 6 x 20 + 20m (%)	4,025±0,339	8,422
Added step (sec)	6,948±0,440	6,332
Fan (sec)	18,676±0,778	4,165
Back mobility (cm)	1,412±1,016	71,954
Right shoulder mobility (degrees)	114,875±6,577	5,725
Left shoulder mobility (degrees)	11,750±11,949	10,692
Forward throw (m)	5,375±1,505	28,000
Forehand (m)	7,475±1,777	23,772
Backhand (m)	6,975±1,682	24,114

M, average; DS, standard deviation; CV, variability coefficient; n, number of subjects.

Discussion

Currently the sport of tennis practiced by the most valuable athletes in the world is identified with a number of features and development trends to be known and put into practice especially at the right time. This paper is justified because of genuine information on operational strategies focused on continued growth and performance capacity in the absence of authentic instruments measuring general physical training objective parameters. Another point of view is that this paper is justified by the fact that puts in discussion the essential dimensions of general physical training specific to technical and tactical actions that guarantee performance of players playing at the same time, and provides objective measurement tools for this dimensions.

In this study, sprint abilities were found to be good predictors of tennis performance. These results are in good agreement with previous findings on advanced prepubescent male tennis players (13–14 years old), which indicated that physical performance tests in this group of young athletes do predict their ability to play tennis at a competitive level (Girard, Millet, 2009). In the same study, Girard and Millet (2009), found greater values for vertical power ability (CMJ) than in this study which indicated that physical performance tests in this group of young athletes may not predict their ability to play tennis at a competitive level, or it may be a possible source of injuries. For the VO2max, Girard et al. (2006) reported that peak VO2max was higher during an intermittent racket test compared with an incremental test performed on a treadmill like in this study, probably due to the involvement of upper body muscles required for the simulated ball hitting action. All other specific effort dimensions will be taken in discussion in future studies.

Conclusions

After making bibliography synthesis and preliminary study conducted to identify general driving skills of the game of tennis, and then tested the initial experiment group, we have established the following conclusions:

1. Research of specific effort dimensions used in the game of tennis allows us to conclude that the most important physical qualities are those that are involved during technical and tactical game actions for increasing players efficiency in the game. According to these new findings these are: starting speed, speed over short distances (5-20 m), agility and speed coordination, endurance explosive effort, explosive legs power with and without arm help, explosive arm force and medicinal ball speed in flight of the ball from standing position throw, cardio respiratory capacity, strength of segments (abdomen, legs, arms), joint mobility (back, right shoulder, left shoulder).
2. All these physical qualities mentioned above can become didactic targets or operational instructional objectives. These objectives observable and measurable entail setting of element content, instructional strategies and assessment tools of quality and efficient training process. In turn these content and instruction nal strategies can be converted into training programs to ensure instructional objectives set.

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METHODOLOGY OF ASSESSING THE PERSONALITY QUALITIES OF JUNIOR FEMALE GYMNASTS (12- 14 YEARS OLD)

POTOP VLADIMIR[1]

Abstract

The purpose of the paper is to highlight the methodology of assessment of personality qualities of junior female gymnasts 12 to 14 years old during their basic specialization stage of sports training.

*Methods and procedures***.** This scientific approach led to the conduct of an ascertaining experimental study in the junior team of Deva and the National College "Cetate Deva", applied to a group of 19 female gymnasts, 12 to14 years old, all of them having the same training program. The research used the method of bibliographic study; the method of questionnaire; "KyPlot" statistical-mathematical method; ANOVA parametric test of comparison and graphical representation test – Excel. The assessment of the psychological score was performed by applying a questionnaire to a number of 3 coaches who work with junior gymnasts on different apparatus (vaults, uneven bars and beam). The questionnaire included 25 items that were used by means of calculation formulas to assess gymnasts' psychological scores, converted into indices, namely: goal-orientation index (GOI), self-confidence index (SCI), index of the ability to concentrate (IAC), index of performance capacity increase (IPCI) and training capacity index (TCI).

Results. The results of testing the means of gymnasts' personality qualities indices were compared to the assessment scale of the psychological score and to the performances achieved in two competitions (National Juniors' Individual Championships, Deva 2012 and National Masters Championships Onești, 2012), especially on the apparatus where worked the coaches-subjects of the survey.

Conclusions. The assessment of the psychological score of junior gymnasts by each coach separately shows that there are no significant differences in the expression of personality qualities during training, except the goal-orientation index that has significant differences at $P<0.05$, which invalidates the hypothesis proposed by the research. The comparative analysis of personality qualities indices and the performances achieved in competitions highlight the influence of the development level of personality qualities upon the capacity for performance of the junior gymnasts – subject of the research.

Key words: gymnastics, psychological score, performances, personality, tests.

Introduction

Artistic gymnastics has recorded remarkable progresses, highlighting the fact that it develops in accordance with the trends of performance sport, but it has its specific features too, such as: increase of sports mastership, increase and rivalry of competitive programs, processing of new complex routines, sports mastership that reaches virtuosity; improvement of components that provide the training of high classification gymnasts (Vieru, 1997; Arkaev, Suchilin, 2004).

The problem of psychological training in sport, in general, and in gymnastics, in particular, is of great interest due to an increase of the international competitive system and especially to the tenacious sports competition (Vieru, 1997). The ever increasing requirements in performance gymnastics both related to the athletes and to the teachers, trainers, policy makers, led to the recognition of the significance that the psychological preparation has in sports training process (Grigore, 2001).

Simultaneously with the extent of performance sport, the importance of the psychological factor in performance athletes' training is more and more taken into consideration, fact that determined the conduct of numerous studies and reseraches embodied in gathering a rich ascertaining factual material but also with strong applicative character. The psychological content of sports training consists in the development of mental capacity under informational and regulating character; intellectual, emotional, volitional and personality traits preparation, development of self-regulating capacity, etc. (Dragnea, Mate-Teodorescu, 2002).

Athlete's psychological training includes a set of general and special measures meant to develop the sides and issues of mental life that are required by sports activity, enabling the athlete to achieve important progresses in training and maximum performances in competitions (Epuran, Holdevici, 1993).

To this effect, the psychological training in sports

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training and competitions helps the coach in several directions, namely (Simion, Mihăilă, Stănculescu, 2011): a thorough knowledge of the athlete, especially in terms of psychology, of character and personality traits seen in their development, implementation of the ways and directions to improve the psychological training in accordance with the specific purposes of sport branches but also with the social-human purposes; orientation of the training towards the achievement of a high mental capacity in accordance with the principles and requirements of performance sport; knowledge of the mechanisms and ways to achieve full preparation as complex process of training and education of athletes, etc.

The psychological preparation, concept with profound meanings, became one of the factors of the training open to the improvement and turning into good account in competitions, as well as a basic compoent of athlete's education and training process, aiming at a successful participation in competitions (Niculescu, 2003).

To cope with the stress of training sessions and competitions, the athlete must be properly prepared in several steps (Epuran, Holdevici, 1993):

Basic mental training which includes all methods and means necessary for building athlete's personality, his or her attitudinal traits;

specific mental training which consists of the development and improvement of those mental qualities that directly determine the performance (Nicu, 1993), motivation, willpower, fortitude, attention, perseverance, desire to win, ability to concentrate, memory, imagination, ability of motor representation;

psychological training for competitions.

Contemporary artistic gymnastics has high requirements on the qualities of female gymnasts' personality. There are several highly important elements for the stages of initial and thorough sports training: *goal orientation, self-confidence, ability to concentrate, ability to increase performances, training capacity* (Adrianov, Kachaev, Chunikhin, 1990).

The purpose of this paper is to highlight the methodology of assessment of junior female gymnasts' personality qualities (12 to 14 years old) during basic specialization stage of sports training.

Methods

This scientific approach led to an ascertaining experimental study in junior team of Deva town and in the "Cetate Deva" National College, applied to a group of 19 female gymnasts, 12 to 14 years old, submitted to the same training program.

Hypotheses of the paper.

The study intended to show that the assessment of the psychological score of junior gymnasts by each coach separately will help to highlight whether there are or there are not significant differences in the manifestation of personality qualities throughout the training process.

Also, the comparative analysis between the personality qualities indicators and the performances achieved in competitions will highlight the influence of the development level of personality qualities on the capacity for performance of the junior gymnasts-subjects of the research.

The research used the method of bibliographic study; the method of questionnaire; "KyPlot" statistical-mathematical method; ANOVA parametric test of comparison and graphical representation test – Excel.

The assessment of the psychological score was performed by applying a questionnaire to a number of 3 coaches who work with junior gymnasts on different apparatus (vaults, uneven bars and beam). The questionnaire included 25 items that were used by means of calculation formulas to assess gymnasts' psychological scores, converted into indices, namely: goal-orientation index (GOI), self-confidence index (SCI), index of the ability to concentrate (IAC), index of performance capacity increase (IPCI) and training capacity index (TCI).

Table no. 1. Establishment of personality qualities

Control period	Level of qualities development				
	Very good	Good	Medium	Poor	Very poor
Initial testing	4.2	3.6-4.1	2.5-3.5	1.9-2.4	1.8-
Final testing	4.3	3.7-4.2	2.6-3.6	2.0-2.5	1.9-

Results

In table no. 2 and figures no. 1 to 5 are shown the results of development of junior female gymnasts' personality qualities, assessed by the three coaches who work with these gymnasts (12 to 14 years old) on various apparatus: vaults, uneven bars and beam.

Table no. 2. Results of personality qualities manifestation
(n=19)

Variables (points)		**Mean ±SD**	**CV %**
IOS	M1	2.41±0.85	35.36

	M2	3.40±0.98	28.9
	M3	2.77±1.16	42.01
	XM	2.86±0.94	32.8
IÎS	M1	3.13±0.96	30.92
	M2	3.24±0.84	26.18
	M3	3.00±0.97	32.51
	XM	3.12±0.84	27.09
ICC	M1	2.62±0.91	34.77
	M2	3.25±0.94	28.83
	M3	3.28±0.99	30.19
	XM	3.05±0.90	29.52
IPCI	M1	2.54±0.95	37.45
	M2	3.2±0.87	27.24
	M3	3.05±1.03	33.75
	XM	2.93±0.87	30.01
TCI	M1	2.41±1.04	43.24
	M2	2.93±0.97	33.26
	M3	3.00±1.10	36.72
	XM	2.78±0.97	35.11
ICG	M1	2.62±0.91	34.69
	M2	3.20±0.89	28.04
	M3	3.02±1.01	33.38
	XM	2.95±0.89	30.16

M1- coach for handspring vaults; M2 – coach for uneven bars; M3 – coach for beam; XM – mean of coaches; SD – standard deviation; CV – coefficient of variability; n –number of subjects; goal-orientation index (GOI), self-confidence index (SCI), index of the ability to concentrate (IAC), index of performance capacity increase (IPCI) and training capacity index (TCI)

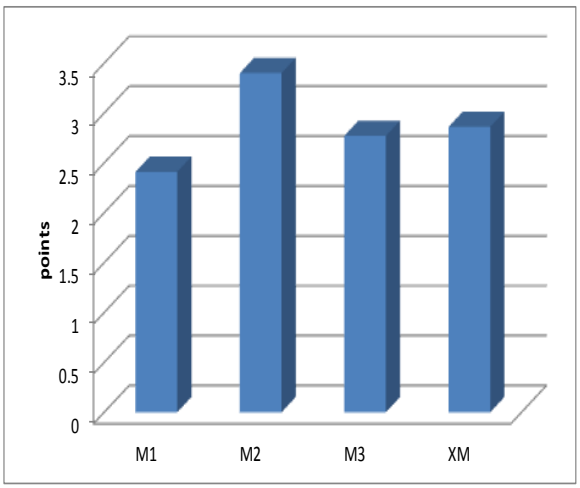

Figure no. 1. Results of the development of goal-orientation index (table no. 2)

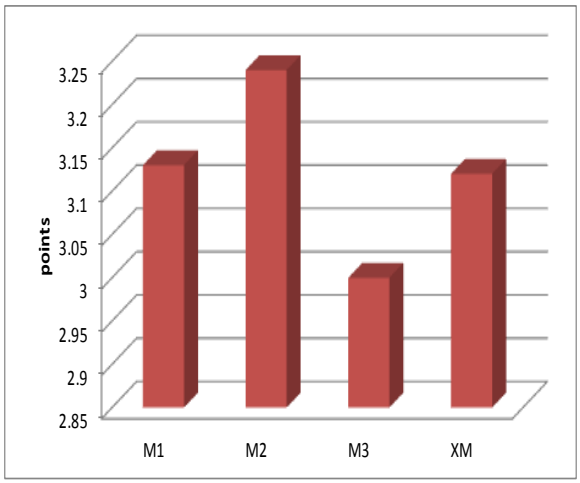

Figure no. 2. Results of the development of self-confidence index (table no. 2)

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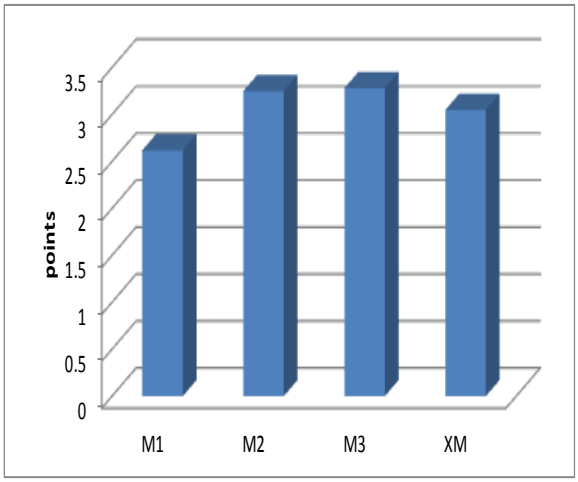

Figure no. 3. Results of the development of ability to concentrate index (table no. 2)

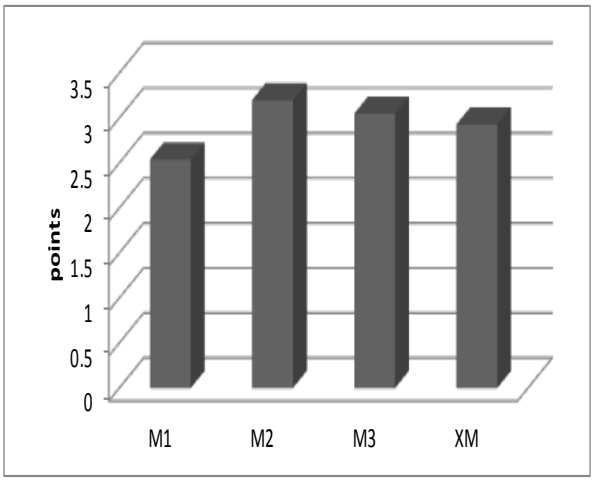

Figure no. 4. Results of the development of the index of performance capacity increase (table no. 2)

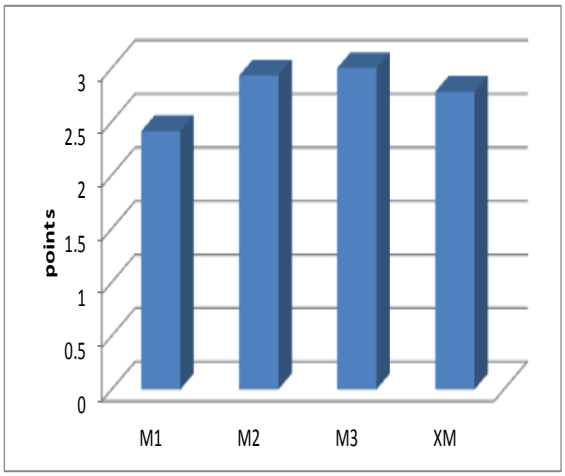

Figure no. 5. Results of the development of training capacity index (table no. 2)

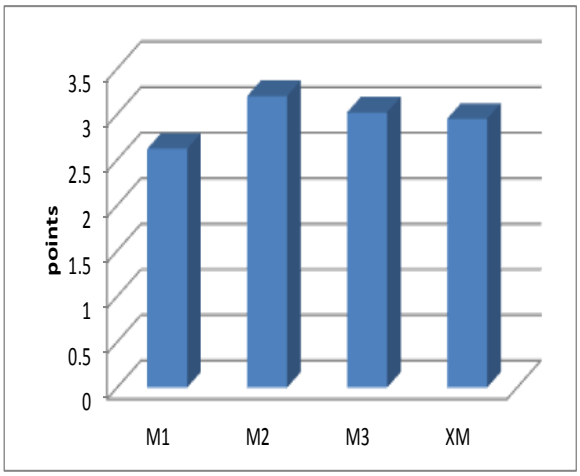

Figure no. 6. Results of general behavior of personality qualities (table no. 2)

Table no. 3. Results of ANOVA parametric test of comparison

Variables (points)	F (cal)	P(F< F(cal)	F (0.05)
IOS	4.69 (P<0.05)	0.013	3.168
IIS	0.32 N.S.(P>0.05)	0.726	3.168
ICC	2.96 N.S.(P>0.05)	0.06	3.168
ICP	2.54 N.S.(P>0.05)	0.08	3.168
ICI	1.82 N.S.(P>0.05)	0.17	3.168
ICG	1.92 N.S.(P>0.05)	0.16	3.168

In table no. 3 are listed the results of the indexes of junior female gymnasts' personality qualities by means of ANOVA comparative test between the means of the three coaches (M1, M2 and M3).

Table no. 4. Results got in the National Individual Championship for juniors, 25- 27.X.2012 – Deva (n = 16)

Statistical	HV *(points)*			UB *(points)*			B *(points)*			F *(points)*					
indicators	D	E	FS	D	E	FS	D	E	Pen.	FS	D	E	Pen.	FS	Total
Mean	4.29	8.76	13.04	4.68	8.18	12.86	5.3	7.96	0.1	13.24	5.2	8.89	0.17	14.05	42.33

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SEM	0.09	0.08	0.11	0.14	0.19	0.25	0.08	0.18	-	0.24	0.08	0.19	0.06	0.25	4.12
N	12	12	12	14	14	14	13	13	1	13	12	12	3	12	16

SED – standard error deviations; HV - handspring vaults; UB – uneven bars; B – beam; F – floor

Table no. 5. Results got in the National Masters Championship, 16-18.XI.2012 – Onești (n = 15)

Statistical	HV *(points)*			UB *(points)*			B *(points)*			F*(points)*					
indicators	D	E	FS	D	E	FS	D	E	Pen.	FS	D	E	Pen.	FS	Total
Mean	4.45	8.88	13.32	4.28	7.73	12.01	5.23	8.29	-	13.52	5.07	8.47	-	13.54	**49.785**
SEM	0.10	0.04	0.12	0.21	0.28	0.39	0.11	0.16	-	0.23	0.07	0.13	-	0.17	**1.52**
N	15	15	15	14	14	14	14	14	-	14	14	14	-	14	**15**

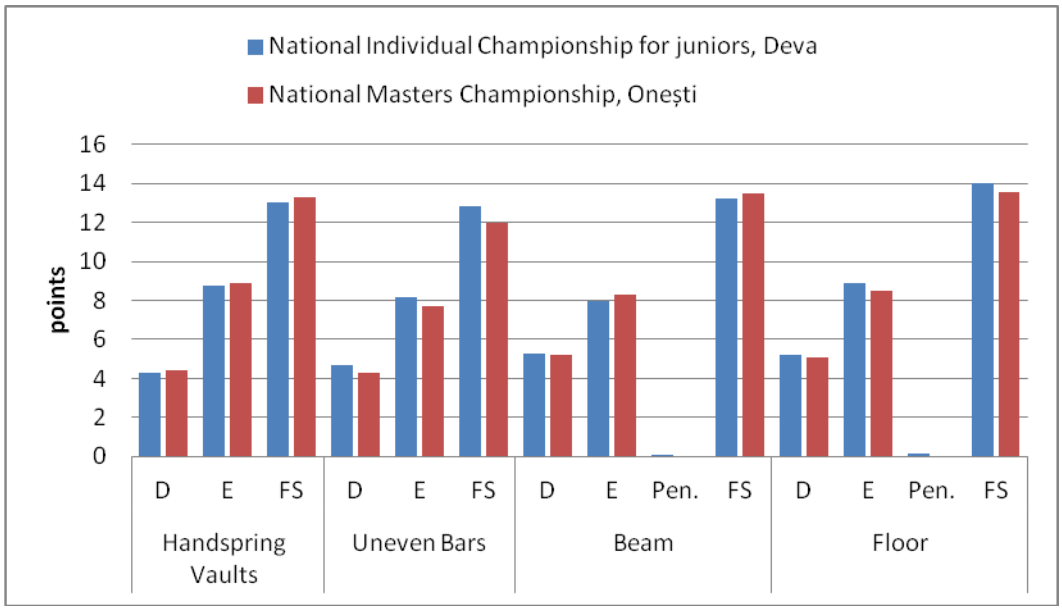

Figure no. 7. Comparative results achieved in competitions (table's no. 5 and 6)

Table no. 4 show the results obtained in the National Individual Championship for juniors, Deva 2012, in terms of difficulty, execution and final score on each apparatus.

Table no. 5 show the results achieved in the National Individual Championship for juniors, Deva 2012, highlighting the difficulty, execution and final score on each apparatus.

Discussions

The assessment of junior female gymnasts' personality qualities development highlights their development throughout the ascertaining stage of the research.

Although the need for more research on the determinants of elite performance in rhythmic gymnastics is apparent, the findings of the present study could help coaches on providing more effective training to their gymnasts (Zisi et al, 2009).

Concerning the psychological characteristics, self-confidence was significantly affected by performance level. This result is in accordance with the literature findings suggesting a strong association of self-confidence with elite performance in various sports (Woodman & Hardy, 2003).

The results of gymnasts' personality qualities emphasize the following aspects (table no. 2):

Ggoal orientation index (GOI, fig.1) shows an average level of development, with an assessment mean of the three coaches of 2.86 points, 2.41 points as assessed by coach M1 (vaults), 3.40 points as assessed by coach M2 (uneven bars) and 2.77 points – M3 (beam); all the means of the coaches prove a poor homogeneity in the experimental group;

Self-confidence index (SCI, fig.2) shows an average level of development, with an assessment mean from coaches' part of 3.12 points; 3.13 points as assessed by coach M1, 3.24 points as assessed by coach M2 and 3.00 points – coach M3; all the means of the coaches demonstrate a poor homogeneity within the experimental group;

Index of the ability to concentrate (IAC, fig.3) shows an average level of development, with an assessment mean from coaches' part of 3.05 points, 2.62 points as assessed by coach M1, 3.25 points as assessed by coach M2 and 3.28 points – coach M3; all

the means of the coaches prove a poor homogeneity in the experimental group;

Index of the performance capacity increase (IPCI, fig.4) shows an average level of development, with an assessment mean from coaches' part of 2.93 points, 2.54 points as assessed by coach M1, 3.2 points as assessed by coach M2 and 3.05 points – coach M3; all the means of the coaches prove a poor homogeneity in the experimental group;

Training capacity index (TCI, fig.5) shows an average level of development, with an assessment mean from coaches' part of 2.78 points, 2.41 points as assessed by coach M1, 2.93 points as assessed by coach M2 and 3.00 points – coach M3; all the means of the coaches prove a poor homogeneity in the experimental group;

Index of general behavior (IGB, fig.6) shows an average level of development, with an assessment mean from coaches' part of 2.95 points, 2.62 points as assessed by coach M1, 3.20 points as assessed by coach M2 and 3.02 points – coach M3; all the means of the coaches prove a poor homogeneity in the experimental group.

The poor results in terms of homogeneity of the means are explained by the differences of the scores given by each coach and by the training level of gymnasts on each apparatus.

The results of the psychological score during ascertaining stage listed in table no. 3 highlight insignificant differences between the means of the indices of personality qualities development granted by each coach, with a general mean of 2.95 points, excepting the goal-orientation index (GOI), which shows significant differences between the means given by coaches, namely $F = 4.69$ at $P<0.05$.

The results of the scores received in the National Championship for juniors, Deva 2012, highlight the following means: in the case of the handspring vaults, a mean of the score for difficulty of 4.29 points, 8.76 points for execution score and 13.04 points for final score mean; on uneven bars – a mean for difficulty score of 4.68 points, 8.18 points for execution and 12.86 points for final score; on beam – a mean of the difficulty score of 5.3 points, 7.96 points for execution score, 0.1 points penalty and 13.24 points for final score mean; on floor – a mean for difficulty score of 5.2 points, 8.89 points for execution, 0.17 points and 14.05 points for final score mean.

As for the total score on apparatus, we notice a mean of 42.33 points, with a number of 16 gymnasts participating in the competition, with different participation number on each apparatus.

The results of the scores received in National Masters Championship, Onești2012, highlight the following means: in the case of the handspring vaults, a mean of the score for difficulty of 4.45 points, 8.8 points for execution score and 13.32 points for final score mean; on uneven bars – a mean for difficulty score of 4.28 points, 7.73 points for execution and 12.01 points for final score; on beam – a mean for difficulty score of 5.23 points, 8.29 points for execution score and 13.52 points for final score mean; on floor – a mean for difficulty score of 5.07 points, 8.47 points for execution and 13.54 points for final score mean.

As for the total score on apparatus there is a mean of 49.786 points, with a number of 15 gymnasts participating in competition with a different number of participation on each apparatus.

Conclusions

The results of personality qualities development highlight an average level of expression, insignificant differences of the assessment means given by coaches and poor values of the homogeneity in the experimental group.

The comparative results of the scores received in competition highlight an increase of the difficulty score, execution score and final score mean in the case of handspring vaults; uneven bars – a decrease of difficulty, execution and final mean; on beam – decrease of difficulty, improvement of execution and increase of final score mean; on floor – decrease of difficulty, execution and final score mean and the increase of total score on apparatus.

The comparative analysis between the personality qualities indices of the tested gymnasts and the performances achieved in competitions highlighted the improvement of training level by increasing the difficulty of exercises, by improving the technical execution and by increasing the final score on each apparatus.

The assessment of the psychological score of junior gymnasts by each coach separately proved that there were significant differences in the expression of personality qualities during training process.

The comparative analysis of personality qualities indices and the performances achieved in competitions highlight the influence of the development level of personality qualities upon the capacity for performance of the junior gymnasts – subject of the research.

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IMPROVEMENT OF KEY ELEMENTS OF SPORTS TECHNIQUE BASED ON THE BIOMECHANICAL ANALYSIS OF YURCHENKO VAULT

POTOP VLADIMIR[1]

Abstract

The goal of the work is the improvement of the key elements of sports technique by an efficient use of the didactic technology for Yurchenko vault.

Methods and procedures. This scientific approach led to the conduct of an experimental study in the Junior team of Deva, applied to a group of 10 female gymnasts, 12 to 14 years old. We used in this research the following methods: bibliographic study method; observation method; video-biomechanical method; "KyPlot" statistical-mathematical method and „Excel" graphical representation method. The biomechanical analysis was made by means of a specialized program called Physics ToolKit Version 6.0, monitoring the key elements of sports technique (according to Boloban, V., 1990): *start position* of the body (PP), *multiplication of position* of the body (MP) and *final position* (FP) of the body.

Results. The results of the study highlight the didactic technology of improvement of key elements of Yurchenko vault. The biomechanical characteristics of video analysis of Yurchenko vault have contributed to the creation of linear-branched algorithmic programs meant to improve the key elements of sports technique in terms of trajectories of body segments, height and length of the 2nd flight and the influence of the biomechanical indicators on the correct execution of the vault.

Conclusions. The creation of linear-branched algorithmic programs for each key element of Yurchenko vault contributed to the improvement of the technical execution and to the achievement of better performances in competition.

Key words: biomechanical analysis, gymnastics, algorithmic learning, performance.

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Introduction

Artistic gymnastics develops in accordance with the trends of performance sport, but it has its specific features, such as: increase of sports mastership, increase and rivalry of competitive programs, processing of new complex routines, sports mastership that reaches virtuosity; improvement of components that provide the training of high classification gymnasts (financial, technical - material, methodical-scientific, biological-methodical, psychological, informational and motivational components) (Arkaev, Suchilin, 2004).

In artistic gymnastics, technical training must be very demanding, because the primacy in competitions is determined by the accuracy of movement (amplitude, expressiveness, fluidity of movement, a.s.o.). The analysis of technique highlights the following components (Dragnea, Mate- Teodorescu, 2002): *technical element, technical procedure, style and basic mechanism of technical procedure*.

Learning any technical procedure is based on models established by specialists following up numerous and thorough studies of biomechanics. Video and audio devices, located in various positions to cover all trajectories of the body and their segments are highly important for the analysis of the technique. The study of technique and the determination of its rules results in increasing speed of execution, optimal coordination, identification of mistakes, etc. (Dragnea, Mate-Teodorescu, 2002).

Mistakes may occur throughout the learning or improvement of gymnastics movements. In these cases, things can not be allowed to continue in this way (Vieru, 1997). Practice has shown that if the small mistakes are not removed in due time, then they have the tendency to join the technical structure and to transform themselves into a big mistake. Technical mistakes are divided into: *systematic, random and typical ones* (Arkaev, Suchilin, 2004).

In order to group the gymnastics elements into parts, several criteria can be used, such as pedagogical, psychological, physiological, biomechanical ones, etc. The increase of objectification level goes from the pedagogical criteria towards the biomechanical ones. That is why the biomechanical criteria are used for dividing the gymnastics elements into parts. Thus, the technical structure of gymnastics elements contains three levels – *periods, stages and phases* (Suchilin, 2010).

Biomechanical researches in artistic gymnastics can be performed using both biomechanical methods and methods taken from other fields of knowledge (pedagogical, mechanical, physiological, psychological, medical ones, etc.), mainly intended to highlight the features of movement on various apparatus by selecting the means of recording, processing and analyzing the data obtained (Potop, 2007).

The general problem in the study of movements is the assessment of forces application for achieving a high efficiency, efficiency that is given by the way to use energy (Grigore, 2001).

Due to the impressive dynamics of gymnastics competition, at the present moment the number of technical elements created by the great male and female champions, who distinguished themselves during this period, increased considerably, some of them taking the coded names that reflect the biomechanical characteristics, besides the names of the athletes who executed them with unique virtuosity (Endo, Drăgulescu, Yurchenko, Tsukahara, Miloşevici, Comăneci, Şuşunova, etc.) (Nicu, 1993).

In this context it is clear that each one of the modern sports is based on exercises that vary depending on the general volume of the material and on the specific structure; the problem of motor skills transfer is highlighted differently (Gaverdovkij, 2007).

Numerous studies and researches are scientifically applied for understanding and classification based on the clearly defined field of biomechanical study of gymnastics movements. The most recent classification of movements in gymnastics was made by Bruggmann, 1994, taken after Hochmuth and Marthold, 1987. Handspring vaults represent the event with a single basic technical structure and variants of this one. The authors B. Bajin, 1979; G.P. Bruggmann, 1984; Y. Takei, 1984- 1998; Y. Takei and L. K. Kim, 1992; Li and J. Krug, K. Knoll and Zocher, 1998, examine the elastic parameters of the springboard, the parameters of contact with the floor, the support and the landing parameters, also the correlation of mechanical variables and the score of the vault (Crețu, 2004).

In the last decade came this modality to perform, in the last part of the impetus, the hurdle onto springboard too, by executing the round-off. This modality has the advantage that gymnast's body lay in a position favorable for backward handspring (flick-flack). The most important moment is the handspring on the apparatus, that should be done exactly in handstand (vertically forward), the arms placed as an extension of the torso in order to make possible the support reaction through body's centre of gravity (CGC). From this specific moment, all variants of handspring vaults can be performed (tucked, piked, stretched, 360º, 540º, 720º or 900º twist) (Vieru, 1997). These vaults belong to the 4th group called Yurchenko (Smolevskij, Goverdovskij, 1999). If the female gymnast makes a 180º turn after round-off as soon as she takes off from the springboard, she will turn face towards the vaulting table and she will be able to execute afterwards a forward handspring with forward salto (tucked, piked or stretched with 180º or 360º twist. These vaults

belong to the 5th group of vaults table in the Code of Points.

Three systems of coordination are used in the biomechanical analysis. One of them – fixed or inertial, which is usually related to gymnastics apparatus, and the other two – mobile (non - inertial), related to athlete's body. Technique analysis relates to the highlighting of biomechanical characteristics and to motion parameters. The biomechanical characteristics are divided into kinematic (spatial, temporal and spatial-temporal) characteristics and dynamic characteristics (force and energy). (Arkaev, Suchilin, 2004).

In terms of structural relations, existing between movements, we emphasize two aspects of these relations – biomechanical and didactical. Researches have shown that there are several types of structural relations of movements, which can pass from an exercise to a similar one during learning process. All types of structural relations can be divided into three classes according to the reason of the profile movement. Emerging from the meaning of the profile exercises, one can establish two main classes of structural relations – "intra-profiles" and "inter-profiles". These "intra-profile" exercises refer, for example, to 4th group vaults – Yurchenko, while the "inter-profile" exercises are the relations of vaults belonging to different groups (Smolevskij, Gaverdovskij, 1999).

Learning gymnastic exercises is a difficult and tiring process, but happy after the final result. In order to enable a future gymnast to perform a highly difficult exercise, the coach should carefully and creatively implement the long-term learning program, working according to the schema "*when learning the acrobatic exercises, one must go from the main target to the concrete one and again to the main target* ", keeping under control the entire learning process, considered for the perspective (Boloban, 2011).

The didactic structure of the learning program is developed taking into account the level of athletes' physical and technical training, the difficulty of the training routines; the interdependence of the main and concrete goals, the learning tasks; the specific didactic principles; regulatory elements, methods and means for process control and correction, results of learning by using the biological reverse afferentation (visual-motor, verbal – motor, visual-verbal, vestibular-motor) (Boloban, 2011).

The implementation of learning programs in the structure of motor representation molding aims at the exercises of initial learning, thorough learning, strengthening and improvement of the further execution of exercises based on the information provided by the personality traits, the properties of practitioners' nervous system, also the multi-disciplinary features of the motor abilities and skills development (biological, biomechanical, regulatory, psycho-pedagogical) (Boloban, 1990).

The building of motor representation in the stage of initial learning of gymnastics exercises with complex coordination, along with the implementation of learning program, help to develop the orientation in space; the athletes learn how to evaluate the execution time of exercises different phases and of the entire exercise; they also improve the sense of muscular contraction, necessary for a correct technical performance of motor tasks (Boloban, 2011).

The development of the system of movements by thorough learning of gymnastics exercises with complex coordination can be achieved through the following educational technology elements: goal of learning, tasks of learning, multi-disciplinary particularities; primarily there are applied the didactic principles, the methods and means of learning. Variants of thorough learning*: learning of the whole exercise, learning of the key elements of sports technique, learning of the exercise divided into parts*. The improvement of movements system while learning the gymnastics exercises with complex coordination, presented by the didactical technology by unifying the long-term programs, the training programs and the structural elements of the competitive activity (Boloban, 2011).

The goal of the work is the improvement of the key elements of sports technique by an efficient use of the didactic technology for Yurchenko vault.

Methods

Hypothesis of the research. We believe that an efficient use of the didactic technology over the improvement stage of movements system by means of the biomechanical analysis of the key elements of Yurchenko vault will lead to the elaboration of the algorithmic programs for the improvement of these ones and for the achievement of better performances in competitions.

This scientific approach led to the conduct of an experimental study in the Junior team of Deva, applied to a group of 10 female gymnasts, 12 to 14 years old. We used in this research the following methods: bibliographic study method; observation method; video-biomechanical method; "KyPlot" statistical-mathematical method and „Excel" graphical representation method. The biomechanical analysis was made by means of a specialized program called Physics ToolKit Version 6.0, monitoring the key elements of sports technique (according to Boloban, V., 1990): *start position* of the body (PP), *multiplication of position* of the body (MP) and *final position* (FP) of the body.

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Results

Table 1. Biomechanical indicators of Yurchenko vault

Ind. statistical	Height, m	Weight, kg	I.R., kgm^2	Toes	R.M. / G.C.G., m Knee joint	Shoulder joint	Wrist joint
Mean	1.48	37.33	78.53	0.706	0.343	0.428	0.588
S.E.M.	0.02	1.63	5.37	0.03	0.01	0.01	0.02

R.I.- rotational inertia; R.M.- radius of movement; GCG –general center of gravity (hip).

Table no. 1 shows the biomechanical indicators in terms of size, weight, inertia of rotation and the relation the movement radius between the GCG and body segments (Knee joint, Shoulder joint, Wrist joint).

Table no. 2. Results of body segments movement during back tucked somersault Yurchenko vault

Key components	GCG X	GCG Y	Toes X	Toes Y	Knee joint X	Knee joint Y	Shoulders joint X	Shoulders joint Y	Wrist joint X	Wrist joint Y
SP1	1.15	0.83	0.98	0.22	1.20	0.53	1.35	1.20	1.61	1.42
SP2	0.24	1.95	0.75	1.82	0.54	2.11	-0.002	1.66	-0.26	1.31
MP- m.m.H	-0.44	2.41	-0.65	2.52	-0.65	2.24	-0.14	2.20	-0.15	1.76
FP	-1.96	0.94	-2.14	0.28	-1.98	0.56	-1.63	1.18	-1.48	0.79

Start position (SP1)- hurdle onto springboard, handspring and flip off of the table (SP2), moment of maximum height (m.m.H.) of GCG during flight II and final position (FP)- landing.

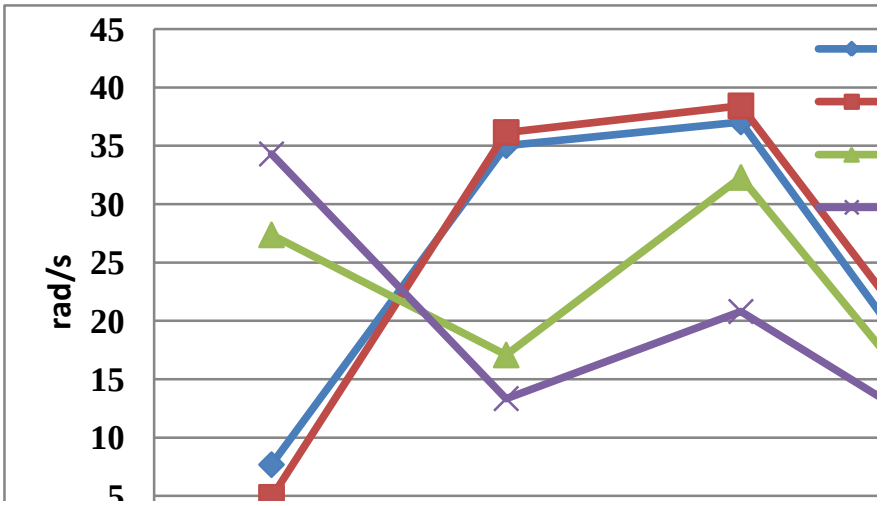

Fig. 1. Rezults angular velocity of body segments Yurchenko tucked vault

Table no. 3. Angular velocity of body segments Yurchenko tucked vault

Key components	Toes Omega, rad/s	Knee joint Omega, rad/s	Shoulders joint Omega, rad/s	Wrist joint Omega, rad/s
SP1	7.68	4.88	27.37	34.30
SP2	35.02	36.14	17.08	13.34
MP- m.m.H	37.04	38.42	32.29	20.80
FP	9.43	12.01	7.80	8.42

Table 4. Results of body segments movement during back pike somersault Yurchenko vault

Key components	GCG X1	GCG Y1	Toes X1	Toes Y1	Shoulders joint X1	Shoulders joint Y1	Wrist joint X1	Wrist joint Y1
SP1	1.38	0.86	1.12	0.19	1.70	1.19	2.06	1.37
SP2	0.38	2.00	1.05	2.28	0.28	1.68	0.02	1.28
MP- m.m.H.	-0.13	2.46	-0.79	2.21	0.15	2.19	-0.3	2.02
FP	-1.60	0.92	-1.82	0.23	-1.27	1.08	-1.35	0.72

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Table 5. Angular speed of body segments during pike somersault Yurchenko vault

Key components	Toes Omega, rad/s	Shoulders joint Omega, rad/s	Wrist joint Omega, rad/s
SP1	10.16	30.89	35.83
SP2	29.71	22.03	14.78
MP- m.m.H.	37.77	24.54	9.95
FP	16.27	23.39	18.06

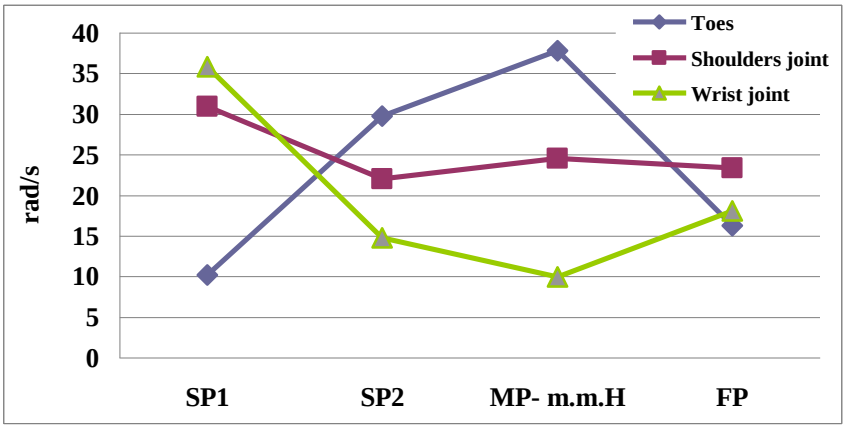

Fig. 2. Angular speed of body segments during pike somersault Yurchenko vault

Table 6. Results of body segments movement during back layout somersault Yurchenko vault

Key components	CGG		Toes		Shoulders joint		Wrist joint	
	X1	Y1	X1	Y1	X1	Y1	X1	Y1
SP1	1.26	0.85	1.06	0.22	1.38	1.26	1.99	1.33
SP2	0.35	1.95	1.17	1.99	0.23	1.64	0.004	1.31
MP- m.m.H.	-0.4	2.42	-0.88	1.86	0.004	2.37	-0.16	2.10
FP	-1.98	0.84	-2.07	0.31	-1.72	0.16	-1.37	0.93

Table 7. Angular speed of body segments during layout somersault Yurchenko vault

Key components	Toes Omega, rad/s	Shoulders joint Omega, rad/s	Wrist joint Omega, rad/s
SP1	13.19	32.15	35.73
SP2	36.18	21.69	15.18
MP- m.m.H.	37.14	32.39	23.51
FP	6.33	14.14	16.70

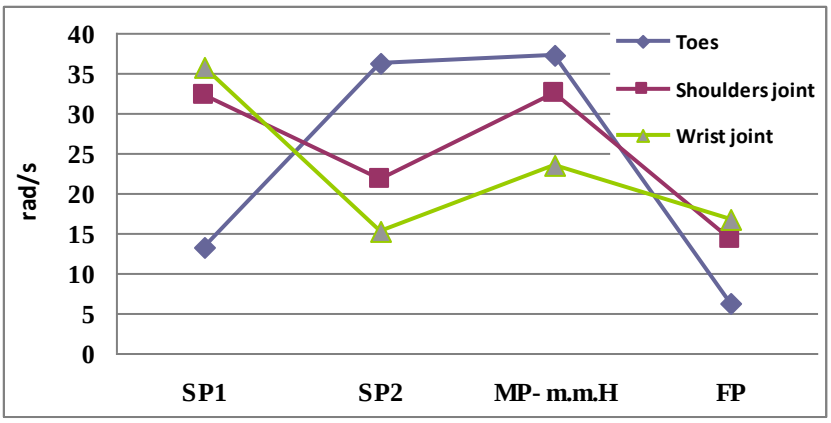

Fig. 3. Angular speed of body segments during layout somersault Yurchenko vault

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In tables no. 2, 4, 6 are listed the results of the average values of body segments position of key elements in Yurchenko vault with back tucked, pike and layout somersault.
The tables no. 3, 5 and 7 and the figures 1, 2 and 3 show the results of body segments angular velocity average values in terms of key elements of Yurchenko vault with backward tucked, pike and layout somersault.

Table 8. Force GCG Yurchenko vault

Key components	YSG F, N	YSE F, N	YSÎ F,N
SP1	6796.67	5950.0	5976.67
SP2	2906.67	3970.0	4366.67
MP- m.m.H	5403.33	6600.0	5470
FP	5850	8105.0	10006.67

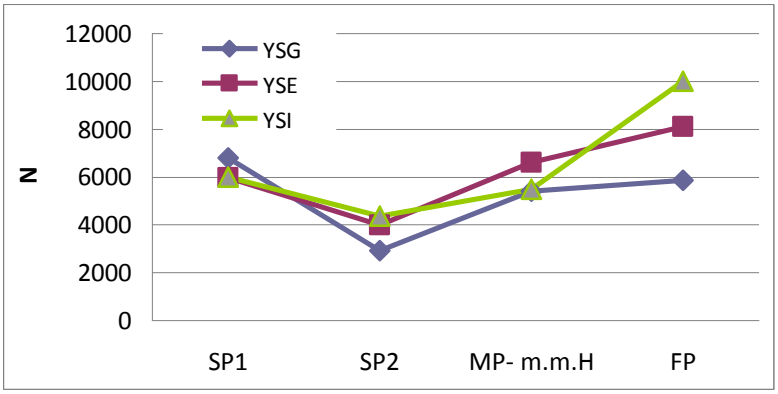

Figure 4. Force GCG Yurchenko vault

Table no. 8 and figure no. 4 show the resultant of the average strength of GCG related to the other joints in each key element of back tucked, pike and layout Yurchenko vault.

Table 9. Performances achieved in competition

Gymnasts	Indiv. comp.			App. finals	
	D	E	FS	Score	Rank
S.Ş.	5.000	8.800	13.800	13.562	1
T.P.	4.000	9.050	13.050		
O.A.	5.000	9.100	14.100	13.500	3
I.A.	4.400	8.800	13.200		
N.I.	4.000	8.650	12.650		
P.E.	4.000	8.700	12.700		
Mean	4.400	8.85	13.25		
SEM	0.2	0.07	0.24		
SD	0.48	0.18	0.58		
CV%	11.13	20.8	4.44		

Table no. 9 shows the performances achieved at vaults by the experimental group in terms of vault difficulty (D), score for execution (E), final score (FS) and the ranking in apparatus finals.

Discussions

According to the Code of Points, in women's artistic gymnastics the handspring vaults are divided into 5 groups (***FIG, 2009); the round-off stretched salto backward vault (Yurchenko) belongs to group IV. All handspring vaults have one thing in common, determined by the phases that compose their full development, namely: *running, hurdle onto springboard, first flight, support with hands on table (handspring), second flight and landing* (Vieru, 1997).

From two recent reviews of the literature by Prassas (2006) et al and Sands (2003), there are no studies concerning specifically the YUSB. However,from the studies carried out so far on different types of YU (Nelson 1985, Know 1990, Koh 2003, Ragheb 1988, Fortney 1989), it is possible to have some information

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regarding YU temporal duration both horizontal and vertical velocities of the center of mass (COM) at the impact on the board (BIMP) and at the board take-off (BTKO) (Penitente, G., et al, 2007).

The study reveals a need for further research considering methods to reduce RF transmitted to the upper extremities during the Yurchenko vault, floor exercise, and any other athletic skill where high RF are transmitted to the upper extremities (Seeley, M.K., Bressel, E., 2005).

In order to perform a correct Yurchenko vault with stretched salto backward we must take into consideration the following *Specific Mistakes of Execution* (***FIG, 2009):

-in *Flight I,* wrong technique: pelvic angle; arched body, bent knees, legs (knees) apart (0.10- 0.50 P.);

-in *Push-off phase,* wrong technique (successive/alternative support of hands in vaults with flight I forwards, bent arms, shoulders angle, lack of passage in vertical position; longitudinal twist started too early (0.10 – 0.50 P.);

-in *Flight II,* height, accuracy of longitudinal twists, body position (the stretched body position is not maintained, insufficient or late extension, bent or straddled legs (knees) (0.10 -0.50 P.);

-in *Landing,* insufficient length.

General mistakes: sub-rotation in vaults (without fall, with fall), insufficient dynamism.

The development of linear-branched algorithmic programs meant to improve the key-elements of Yurchenko vault consisted in the following elements of didactic technology: purpose and tasks of learning; didactic principles; rules or requirements of technical regulation; methods and means of learning; variants, algorithmic sequence, pedagogic functional level and solution algorithms; program of training sessions and results of competitive activity; transfer of motor skills; control and correction of learning process; results of learning.

The improvement of key elements of Yurchenko vault focused on the correction of SP1 (start position)-hurdle on the springboard so that to contribute to the improvement of 1st flight, namely getting higher on the apparatus (table); SP2 (start position) – handstand on the table, correcting the position especially from shoulder joint and performance of the Corbett in an a slightly oblique angle, in order to ensure the flip off of the apparatus (table); the result was the increase of the length and height of the 2nd flight. The FP (final position) – landing focused on the damping and on keeping the position as correct as possible. The improvement of the key elements of Yurchenko vault based on the biomechanical analysis highlighted the trajectories of body segments in various phases of the vault; the angular velocity of body segments in different moments of the movement and the resultant of GCG strength related to the other segments of the body.

As for the characteristics of the key elements of the biomechanical indicators of Yurchenko vault, *one can highlight the following elements*:

SP1 – in the case of tucked somersault vaults, the hurdle onto the springboard highlights the features as follows: the distance of the hurdle on the springboard is 0.98m related to the table and the highest angular velocity is 34.30 m/s at arms level (HJ); in the case of pike somersault vaults, the hurdle onto the springboard was performed at a distance of 1.12m related to the table and the highest angular velocity is 35.83 m/s arms level (HJ); in the case of layout somersault vault, we notice the hurdle onto the springboard at a distance of 1.06m related to the table middle while the highest angular velocity is 35.73 m/s at arms level (HJ);

SP2 – in the case of tucked somersault vault, the handspring highlights the features as follows: a distance of -0.26m related to the middle of the table and an angular velocity higher than 36.14 m/s at knee level (KJ); in the case of pike somersault vault, a distance of 0.02m related to the middle of the table and an angular velocity higher than 29.71 m/s at toes level (T); in the case of layout somersault vault, the handspring is at 0.004m from table middle and an angular velocity higher than 36.18 m/s at toes level;

MP (multiplication of position) – the 2nd flight, we monitored the maximum momentum of flight height of GCG: at the tucked somersault vault, it is 2.41m and the distance related to the middle of the table is -0.44m, while the highest angular velocity between segments is 38.42 m/s at knee joint (KJ); in the case of pike somersault vault, the maximum height of GCG is 2.46m and the distance related to the middle of the table is -0.13m , while the highest angular velocity between segments is 37.77 m/s at toes level; in the case of layout somersault vault, the maximum height of GCG is 2.42m and the distance related to the middle of the table is -0.4m, while the highest angular velocity between segments is 37.14 m/s at toes level.

FP (final position) – the landing highlights the length of the vault, especially the length of the 2nd flight; at tucked somersault vault, the length is -2.14m related to the middle of the table and a higher angular velocity between segments of 12.01 m/s at knees level (KJ); in the case of pike somersault vault – the landing length is -1.82m related to the table and the rotational angular velocity around GCG is 23.39 m/s at shoulder joint level (SJ); as for the layout somersault vault, the length is -2.07m related to the table, while the angular velocity is 16.70 m at arms level (HJ).

Conclusions

The results of biomechanical indicators characteristics highlight the differences of body segments displacement during each key element of the analyzed vaults.

The key elements execution influences the movement technique and the values of angular velocity during each phase of the vault.

The improvement of key elements of Yurchenko vault by an efficient use of the didactic technology based on the bio-mechanical analysis highlighted significant differences of the indicators of each vault and their influence.The development of linear-branched algorithmic programs for the improvement of each key-element of Yurchenko vault technique contributed to the improvement of technical execution and to the achievement of better results in competition.

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EFFECT DRILLS ON ACCORDING TO THE LAW OF INERTIA IN IMPROVING SOME VARIABLES KINEMATICS AND THE ELECTRICAL ACTIVITY OF MUSCLES OF THE LEGS IN THE EFFECTIVENESS OF THE LONG JUMP

RAED FEAQ ABDUL-JABBAR AL-HADEETHI[1], NABEEL ABDULKADIM ATHAB ALMSHAAKHI[2], GEVAT CECILIA[3]

Abstract
Study aimed designing drills according to the law of inertia in improving some variables kinematics and the electrical activity of the muscles of the legs of the effectiveness of the long jump junior class. Identify the effect drills on according to the law of inertia in improving some variables kinematics and the electrical activity of the muscles of the legs of the effectiveness of the long jump junior class.
Method. Researchers used the experimental the curriculum to suitability nature of the problem. Formed research community players clubs area of Mahaweel and numbered (10) players of the effectiveness of the long jump for the sports season from 2012 to 2013, was chosen as community full sample, were divided into two groups (control and experimental) random method and each group (5) players. The application took drills in accordance with the law of inertia (10) weeks, (2) training unit per week for a total of units (20) and educational unit training. A time ceiling (120) minutes allocated (45-60 minutes) for special exercises with respect to the experimental group, while the control group was applied vocabulary of training curriculum used by the coach. Researchers have resorted to use set of tests (physical tests, tests EMG tests analysis biomechanics), the focus of the study. After obtaining the results were processed statistically using statistical bag Readymade (SPSS).
Conclusions. The results showed that there are real effects of reality drills according to the law of inertia in the improvement of some indicators variables kinematics and electrical of Planning for the muscles of the legs between the tribal and post tests for experimental research group and in favor posteriori tests. The results showed that there are significant effects between the tribal and posteriori tests to control research group in improving some variables kinematics and electrical of Planning indicators of the muscles of the legs between pre and post tests for experimental research group and in favor posteriori tests.
Keys words: law of inertia, force, myoelectric activity.

Introduction

Definition searching: that studies dealing with the laws of mechanical a scientific manner in the field to assist in assessing and evaluating training and physical preparation in conformity and get the results that will help workers in the field of athletics in general and the effectiveness of the long jump is particularly to know their success in raising the levels and physical capacities and physiological skills of their players. That the effectiveness of the long jump events, which saw a big development in the way of performance and achievement of achievement that have made to win a difficult task on the player, so the study and analysis of the variables relied upon by the performance efficiency, especially phase of the Advancement and aspects of biomechanics affecting and that work on developing performance skills and reach to best performing. The Force of the most prominent components of physical preparation needed by the effectiveness of the long jump and affecting the achievement of the Registrar. As if available with factors good performance and detailed knowledge of the stages of technical performance as the effectiveness of the long jump requiring the player to smooth motor performance and speed reaction high power explosive quick muscle legs and compatibility neuromuscular and foregoing stand out the importance of research in the development of ideas Applied as well as interdependence is important between processes physiological anatomy and their impact on what happens from movements related to performance skills effectively the long jump and as that is in harmony with the goal of this performance and therefore lies the importance of research in the application of the laws of mechanical training to develop Special Force and connecting side physiology of the muscles operating

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and side kinematics for performance and represented by effectiveness the long jump.

*Problem of the research***: f**ollow through researchers field Track & Field in general and the long jump in particular, and Note The club competitions and Iraqi universities generally noticed a weakness in the performance skills for the long jump and specifically the stage Advancement of and jump when performance efficiency was therefore due interest in stage by some trainers and researchers not only in terms of training programs, but in terms of upgrading the technical performance (technique) for this skill to the best solution by focusing on training using exercises, equipment and cutting-edge technologies to help it and the fact that all movements player such as jogging, jumping and throwing requiring contraction "muscular" a decentralized ".Proceeded by "adverse movement of the movement required and this means that the muscles stretch before shrinking in the desired direction and a lot of scientific the sources which confirm that the stretch that precedes contraction enhances fill the resulting force when performing central constriction for the same muscle movement such as the Advancement of. This trend training required officials to the training process to use exercises to develop new job muscle based on the chewy muscle and the possibility of effect this exercise in the development of the movement from the side mechanical prompting the Researchers to study these ideas through application exercises according to Newton's first law of the muscles and their effect on activity neuromuscular the aim of improving the technical performance of the athlete and reach it to the highest level, particular in the effectiveness of the long jump in the junior class players sample.

*Research objectives***:** 1 - Recognize some kinematics variables of the effectiveness of the long jump junior class.2 - Recognize the electrical activity of the muscles of the legs of the effectiveness of the long jump junior class.3 - The planning of exercises in accordance with the law of inertia in improving some variables kinematics and the electrical activity of the muscles of the legs of the effectiveness of the long jump junior class.4- Recognize effect training according to the law of inertia in improving some variables kinematics and the electrical activity of the muscles of the legs of the effectiveness of the long jump junior class.5 - Recognize on the differences between the experimental and control groups in the improvement of some variables kinematics and the electrical activity of the muscles of the legs of the effectiveness of the long jump junior class.

*Research hypotheses***:**

1 - No significant differences statistically significant between the tribal and posteriori tests in research variables being studied for both groups and for tests posteriori.

2 - There are significant differences statistically significant posteriori tests in research variables being studied for both the control and experimental groups in favor of the experimental group.

Fields of research:

1.The human sphere: players spend Mahaweel junior class 2012-2013.

2.The temporal sphere: 9/122/2012 until 22/3/2013.

3.Sphere domain: stadiums Mahaweel area, stadiums and laboratories Babylon University - College of Physical Education.

Keys words:

1. Law of inertia: - the motion of a system in the absence of externally applied force. Simply stated, a system at rest will remain at rest, and a system in motion will remain in motion in a straight line until acted upon by an external force. (McLester and Peter, 2008)

2. Force -Something that possesses the capability to cause a change in motion of a system. (McLester and Peter, 2008)

3. Myoelectric activity:- electric current or voltage produced by a muscle developing tension. (Michael, Burke, Arakian, 2000)

*Research methodology and field procedures***:**

1. Research Methodology**: r**esearchers used experimental method for suitability nature of the problem to achieve the objectives of the research.

2. Research community sample**: s**elect researcher's youngsters' community clubs spend Mahaweel effectively the long jump and numbered (10) was chosen sample intentional way for the 2012-2013 sports season. It was divided into two equal groups (experimental, control) and by (5) players per group, was calculated uniformity and parity between the two variables (height, age, mass) as well as (chart indicators electrolysis of muscles and some variables kinematics and achievement).

3. Means and tools and devices used in the research:

Researchers used the following research means:

- sources and arab and foreign references;- observation and experimentation;- testing and measurement;- legal field long jump;

- tape measure (Ahmed Abdel Fattah Abu Ela,1999);- colored duct tape;- medical balance (kg) to measure weight;- type sony video camera (Ahmed Abdel Fattah Abu Ela, 1999);- laptop computer – core-tmi 3 (Compact precario 2 G) del;l;- CD Player CD, DVD;- alcohol and cotton wool for cleaning;- razor blades to remove hair on where to place the

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electrodes;- electrical activity EMG device German-made (Ahmed Abdel Fattah Abu Ela, 1999).

Identification tests**:**

The researchers identified the most important tests of research topic, as follows:

1- Long jump test a steady:

- the purpose of the test: - Measurement of the electrical activity of the muscles of the legs to jump in front.

- tools required: - an appropriate place for the player displays (1.5) m and Length (3.5)m Consider it to be levels Device (EMG), (Laptop), cotton, alcohol.

- description of performance: the lab stands behind the starting line and the pickup is pasted shallow above the middle of the top eight muscles of the muscles of the legs and two rectus femoris and biceps femoris and brutality twin anterior tibial and the left and right leg. The little feet are widely spaced and parallel so that it comes into contact with a comb footed the starting line from the outside. The lab and starts moving the arms back with your knees bent and a tendency forward a little and then the pickup forward as far away as possible by extending the knees and push bipeds with moving arms forward.

- bipeds grades: the works of this device to receive electrical muscle mediated wire hyphen

First exploratory experiment

Researchers conducted numbering exploratory experiments for a period of 3 - 9/12/2012, in golf spend Mahaweel and the sample amounted to Osama full salary, 1999, are from the research sample was intended to:

- getermine the distance of the device which receives a Bluetooth signal from a device EMG.

- identify and determine the distance of the cameras for the effectiveness of the long jump performance - the application of a training module to identify training requirements all 3-6 the main experience:

The tribal tests:

-tribal been testing the sample at 13/12/2012 in track and field stadium to spend Mahaweel.

-Video filming and measurement of variable moment of inertia: the researchers filmed the sample search (experimental and control groups) from the moment of advancement to the moment of landing in the pit through a camera video proved vertically on a point mid-motor performance of the player long jump and that was away from the plate advancement (6.40) meters, and reached high lens camera ground (1.26 m) was filmed scale in the previous mid-point; after the completion of the filming in the extraction of the moments of inertia legs during each stage of advancement after some variables were extracted for the Advancement of phase (focal angle, between him and the pickup over muscle and sends this device signal EMG in the form of a reference Bluetooth receiving device (Type 044 (Pc Interface Model tied a computer personal (Laptop) to be information processing program MyoResearch XP 6.1.67), it is the duty of this program EMG signal and stored in the form of raw EMG signal above the name of the muscle, and can make several of these processors later reference.

2.Long jump test from approaching (digital level):

- the purpose of the test: index to measure the distance between the plate for the Advancement of and place of landing the player;

- the necessary tools:an appropriate place for the player includes the pit and jogging, a tape measure, camera filming Video, phosphorus signs, drawing scale;

- description of performance: jogging fast approaching full distance starts player performance hopscotch or stage of the lead leg jump, then performed a step the second stage of jump and then jump and landing legs together in the landing pit;

- account grades: measurement of the starting line until the last part of the body touches the ground in terms of this line.

- knowledge of the errors that may accompany the experimental work and how to develop appropriate solutions

- locate the pickup on four muscles of the legs.

angle advancement, the angle of starting, the starting speed)

Training Curriculum: promising researchers exercises according to the law of inertia and depending on the variable mass increase, which ranged (2-5%) kg of mass block leg and adult (16.1%) of body mass total, and through knowledge of body mass total was extracted block leg right and in comes laws used in the extraction of the moment of inertia:

Block leg right = body mass x the relative weight of the leg ÷ 100

LAW of inertia = mass of the leg x radius Squaring (length)

And invested in the development of private strength and develop the research sample in the long jump, where they can get a player on the positive impact of training increase the burden it through exercises using jump inhibitions and terracing as well as the relative weights are added to the leg and arm during training. The time of the training share took (40 minutes) During a period of 10 weeks at a rate of three training units in the week, And was started the implementation of the curriculum on Sunday 16/12/2012 and ended on Wednesday20 /2/2013.

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Posttest: testing posteriori sample search experimental and control groups after the completion of the application training units and on Sunday and Monday, which falls2013/2/22

Variables measured kinematics:

- pivot angle: the angle between the line connecting the center of mass of the body and Pivot Points (foot) for a moment touched the ground and the line passing from the point of Pivot Points parallel to the ground.

- advancement of angle: the angle between the line connecting the center of mass of the body and Pivot Points (foot) for a moment before leaving the ground and the line passing Pivot points parallel to the ground.

- the starting angle: the angle between the line connecting the center of masses of the body before starting and after starting directly with the line passing horizontally of body mass before setting off.

- Speed of departure: It is the result of dividing the starting distance (the distance traveled by the center of mass of the body for a moment and after leaving the ground) at the time of this distance.

Statistical methods: Statistical bag was used (SPSS) in the treatment of these results and by the following laws: (arithmetic mean. Standard deviation, the test (t) of the analog samples, test (t) for the independent samples).

Results: 1 shows the results of tests for the working muscles indicators on the legs and some kinmeteki variables and achievement for the two sets of control and experimental research;

Display the results of the tests for the working muscles indicators on the legs of the two sets of control and experimental research.

Table no.1. The statistical landmarks of indicators musculus rectus femoris left and right between the tribal and post tests to sample

Group	muscle	Variables	Tests triball		after me		T	Sig. (2-tailed)
			Mean	Std. Deviation	Mean	Std. Deviation		
Experimental	Rectus Femrois Right	Amplitude	468.600	20.476	669.800	44.634	9.387	0.001
		Area	179.000	13.693	268.600	13.049	7.990	0.001
		Duration	0.560	0.020	0.500	0.018	3.651	0.022
	Rectus Femrois Left	Amplitude	468.600	14.570	572.000	30.846	7.287	0.002
		Area	179.400	12.361	286.600	9.762	12.350	0.000
		Duration	0.560	0.020	0.500	0.018	3.651	0.022
control	Rectus Femrois Right	Amplitude	464.200	18.579	586.400	47.553	-5.597	0.005
		Area	181.400	11.886	224.600	13.867	5.454	0.005
		Duration	0.578	0.013	0.536	0.008	4.583	0.010
	Rectus Femrois Left	Amplitude	470.200	15.254	505.200	12.930	-7.620	0.002
		Area	180.400	12.700	241.600	7.056	7.853	0.001
		Duration	0.578	0.008	0.536	0.005	7.203	0.002

* Significant at the degree of freedom (4) and error ratio <0.05

Table no.2.The statistical landmarks of indicators biceps left and right between the tribal and post tests to sample

Group	muscle	Variables	Tests triball		after me		T	Sig. (2-tailed)
			Mean	Std. Deviation	Mean	Std. Deviation		
Experimental	Biceps femoris Right	Amplitude	384.800	13.103	573.600	21.454	14.683	0.000
		Area	263.000	14.352	356.000	59.211	4.232	0.013
		Duration	0.588	0.008	0.502	0.007	16.710	0.000
	Biceps femoris Left	Amplitude	377.400	12.177	470.600	38.253	5.076	0.007
		Area	261.400	14.707	381.600	12.461	14.113	.000
		Duration	.5656	.011	.5020	.008	12.249	.000
control	Biceps femoris Right	Amplitude	386.2000	12.255	468.200	22.687	14.946	0.000
		Area	264.600	14.363	273.000	6.964	.912	0.413
		Duration	0.569	0.011	0.544	0.011	4.184	0.014
	Biceps femoris Left	Amplitude	379.200	11.031	417.400	15.836	-8.155	0.001
		Area	263.200	15.287	296.600	3.209	4.206	0.014
		Duration	0.580	0.015	0.544	0.011	4.431	0.011

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* Significant at the degree of freedom (4) and error ratio <0.05

Table no.3.The statistical landmarks of indicators tibial muscle left and right between the tribal and post tests to sample

Group	muscle	Variables	Tests triball		after me		T	Sig. (2-tailed)
			Mean	Std. Deviation	Mean	Std. Deviation		
Experimental	tibiales Anterior Right	Amplitude	359.400	10.212	484.200	30.719	9.291	0.001
		Area	251.600	11.567	316.600	14.099	18.534	0.000
		Duration	0.472	0.013	0.396	0.018	9.355	0.001
	tibiales Anterior Left	Amplitude	354.800	9.808	484.400	25.735	8.723	0.001
		Area	225.800	11.344	288.600	5.504	17.067	0.000
		Duration	0.506	0.016	0.464	0.015	7.203	0.002
control	tibiales Anterior Right	Amplitude	361.800	11.211	406.000	16.718	-10.238	0.001
		Area	254.000	10.862	284.200	20.029	2.615	0.059
		Duration	0.480	0.012	0.446	0.015	6.668	0.003
	tibiales Anterior Left	Amplitude	356.600	11.104	398.800	13.663	-6.925	0.002
		Area	254.000	10.862	284.200	20.029	2.615	0.059
		Duration	0.510	0.014	0.488	0.013	3.317	0.029

* Significant at the degree of freedom (4) and error ratio <0.05

Table no.4.The statistical landmarks of indicators twin lateralis muscle left and right between the tribal and post tests to sample

Group	muscle	Variables	Tests triball		after me		T	Sig. (2-tailed)
			Mean	Std. Deviation	Mean	Std. Deviation		
Experimental	Gastronomies Right	Amplitude	663.400	10.334	819.400	19.982	16.911	0.000
		Area	258.200	10.034	354.600	12.778	11.807	0.000
		Duration	0.528	0.039	0.466	0.034	4.571	0.010
	Gastronomies Left	Amplitude	659.000	9.772	817.000	36.523	9.737	0.001
		Area	331. 000	13.838	428.200	12.316	8.337	0.001
		Duration	0.526	0.027	0.426	0.005	9.535	0.001
control	Gastronomies Right	Amplitude	665.200	9.757	720.000	25.942	-6.832	0.002
		Area	259.600	8.142	300.200	11.691	6.144	0.004
		Duration	0.538	0.037	0.510	0.023	3.500	0.025
	Gastronomies Left	Amplitude	661.200	9.284	724.200	35.166	-4.706	0.009
		Area	332.800	14.923	337.200	8.899	.937	0.402
		Duration	0.534	0.033	0.494	0.011	2.638	0.058

* Significant at the degree of freedom (4) and error ratio <0.05

Table no.5. The statistical landmarks of indicators muscles rectus femoris left and right between the two tests post tests sample

Muscle	Variables	Tests triball		after me		T	Sig. (2-tailed)
		Mean	Std. Deviation	Mean	Std. Deviation		
Rectus Femrois Right	Amplitude	663.400	669.800	44.634	586.400	47.553	2.859
	Area	258.200	268.600	13.049	224.600	13.867	5.167
	Duration	0.528	0.500	0.018	0.536	0.008	3.882
Rectus Femrois Left	Amplitude	659.000	572.000	30.846	505.200	12.930	4.466
	Area	331. 000	286.600	9.762	241.600	7.056	8.353
	Duration	0.526	0.500	0.018	0.536	0.005	4.129

* Significant at the degree of freedom (8) and error ratio <0.05

Table no.6.The statistical landmarks of indicators biceps left and right between the two tests post tests sample

Muscle	Variables	Tests triball		after me		T	Sig. (2-tailed)
		Mean	Std. Deviation	Mean	Std. Deviation		

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Biceps	Amplitude	573.600	21.454	468.200	22.687	7.548	0.000
femoris	Area	356.000	59.211	273.000	6.964	3.113	0.034
Right	Duration	0.502	0.007	0.544	0.011	6.877	0.000
Biceps	Amplitude	470.600	38.253	417.400	15.836	2.873	0.021
femoris	Area	381.600	12.461	296.600	3.209	14.770	0.000
Left	Duration	0.502	0.008	0.544	0.011	6.641	0.000

* Significant at the degree of freedom (8) and error ratio <0.05

Table no.7.Shows the statistical landmarks of indicators tibial muscle left and right between the two tests post tests sample

Muscle	Variables	Tests triball		after me		T	Sig. (2-tailed)
		Mean	Std. Deviation	Mean	Std. Deviation		
Tibiales	Amplitude	484.200	30.719	11.211	406.000	5.000	0.001
Anterior	Area	316.600	14.099	10.862	284.200	2.958	0.021
Right	Duration	0.396	0.018	0.012	0.446	4.725	0.002
Tibiales	Amplitude	484.400	25.735	11.104	398.800	6.569	0.000
Anterior	Area	288.600	5.504	10.862	284.200	5.205	0.001
Left	Duration	0.464	0.015	0.014	0.488	2.683	0.028

* Significant at the degree of freedom (8) and error ratio <0.05

Table no.8.The statistical landmarks of indicators gemellus lateralis muscle left and right between the two tests post tests sample

Muscle	Variables	Tests triball		after me		T	Sig. (2-tailed)
		Mean	Std. Deviation	Mean	Std. Deviation		
Gastronomies	Amplitude	819.400	19.982	720.000	25.942	6.788	0.000
Right	Area	354.600	12.778	300.200	11.691	7.023	0.000
	Duration	9.466	9.034	9.510	9.023	2.365	0.046
Gastronomies Left	Amplitude	817.000	36.523	724.200	35.166	4.093	0.003
	Area	428.200	12.316	337.200	8.899	13.391	0.000
	Duration	9.426	9.005	9.494	9.011	12.021	0.000

* Significant at the degree of freedom (8) and error ratio <0.05

Table no.9.Shows the statistical landmarks of some Kinmeteki variables and achievement between tribal and post tests to sample the control and experimental

Group	Variables	unit of measure	Tests triball		after me		T	Sig. (2-tailed)
			Mean	Std. Deviation	Mean	Std. Deviation		
Experimental	Angle basing	Degree	67.170	1.321	71.600	2.073	5.658	0.005
	Angle the Advancement	Degree	72.826	0.818	79.600	1.341	8.653	0.001
	Angle of starting	Degree	15.748	0.426	19.064	0.536	19.010	0.000
	Speed starting	m/s	5.688	0.092	6.574	0.213	9.049	0.001
	Achievement		5.058	0.156	5.338	0.174	26.697	0.000
Control	Angle basing	Degree	67.932	1.724	69.800	1.788	2.036	0.111
	Angle the Advancement	Degree	72.670	0.498	74.902	0.902	5.030	0.007
	Angle of starting	Degree	15.994	0.486	17.246	0.655	2.834	0.047
	Speed starting	m/s	5.666	0.107	5.852	0.074	2.729	0.053
	Achievement	m	5.024	0.194	5.068	0.190	11.000	0.000

* Significant at the degree of freedom (4) and error ratio <0.05

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Table no.10.The statistical landmarks of some Kinmeteki variables and achievement between the two tests the post sample experimental and control

Variables	unit of measure	Tests triball		After me		T	Sig. (2-tailed)
		Mean	Std. Deviation	Mean	Std. Deviation		
Angle basing	Degree	69.400	1.673	71.600	2.073	1.846	0.104
Angle the Advancement	Degree	74.902	0.902	79.600	1.341	6.496	0.000
Angle of starting	Degree	17.246	0.655	19.064	0.536	4.798	0.002
Speed starting	m/s	5.852	0.074	6.574	0.213	7.131	0.000
Achievement	m	5.068	.190	5.338	.174	2.337	0.048

* Significant at the degree of freedom (8) and error ratio <0.05

Discussion

Appears clear from the tables no.1,2,3,4 above both the control and experimental groups have achieved statistically significant differences between the results of tribal and post tests and in favor of the post test. Attribute the researchers of this development to the exercises used by the sample group (control and experimental), which aims to improve the performance of the player according to scientific bases for curricula training installed in accordance with experience coach and his analysis makes sense and what distinguishes the curriculum used by the members of the research sample experimental and direction specialist, as is his goal in the development of Special Force performance to the maximum possible to achieve the highest impetus and the least possible time. The moment where the player to exert maximum force to upgrade to a high at the highest point of the moment push requiring the broad compatibility between the outcome of the forces exerted in several directions by the members of the body of joint specialist in performance in order to reach dynamic correct movement that results in economic stress and time wanted to increase the result of push strength. As increased result of push strength requires a balance "physically" in the transfer of power from one moment to based and Advancement and, which have a significant role in achieving better smooth and agree to increase result of push strength to move the body in the right direction and the right which ensures achieving greater speed starting of the body to get the best momentum (Qassim Hassan Hussein et al, 1991). And this is reflected in actual indicators the electrical activity of muscles are (index Summit, space, time), as the exercises used according to the law of inertia may addition carry on the work of muscles within angles required them which require achieve better strength and subscription what is required of the muscles Specialist which led to the smooth flow of high performance and economy and a time of instant push and thereby an increase in the result of muscle strength, force influenced by mechanical factors in terms of increased muscle work or push to take advantage of mechanical laws. (Ahmed Abdel Fattah Abu Ela, 1999). Also led neuromuscular adaptations that occur as a result of qualitative explosive training is primarily responsible for increasing the speed voluntary muscle contraction (Abdul Karim al-Fadhli, 2010) .The increase in mass index on the legs but resulted to an increase in the ability of muscle contraction as a result of (increasing the capacity of the muscle in its rubber part at the expense of the result contraction, which increases the susceptibility of muscle to work against different types of resistors (mass added) and especially over the body weight.

The performance jump in the effectiveness of the long jump require to tune "between defibrillation central and decentralized, as this rotation between constriction animated central and decentralized be a pattern of movement muscle called cycle elongation and contraction. And that increase muscle strength leading to increased capacity explosive, which leads to increase the player's ability to rise to the top (Hakkinen, Komi 1983). The physical training leads to greater discourage of the muscle activity counter, which ultimately leads to increased muscle strength resulting from the working muscles during contraction (Michael, Burke, Arakian,2000).Also appears in the tables (Qassim Hassan Hussein et al, 1991, Mohammad Yousuf Sheikh, 1996, Mohamed Mahmoud Abdel Dayem et al, 1993, Naji happiest,1999) that there are differences "between moral post-test results for the two sets of research (experimental and control) in favor of the experimental group, which has worked according to scientific bases exercises are designed according to a law of inertia indicators and goal increase the mass. Researchers believe that the force exerted in the experimental group was more smooth towards the desired performance jump of the effectiveness of the long jump, which resulted to reduce the loss of force exerted, meaning there is a compatibility dynamic composition of between the path of force and motion in terms of flow in the sense path of force in relation to time, this movement (Mohammad Yousuf Sheikh) . This means that the time of the turning point systolic between work the muscles of the an anti to systolic are faster relatively experimental group compared with the control group and this is what leads to the result capacity of the muscle of the outcome of the work of

cross between working muscles and against them in the work and efforts of the player for a moment push must be level high impact because it is the result of the result of final payment in the muscles of the body working on the joints of the body contribute to the Wireless Performance Hashim Adnan al-Kilani, 2000) . The increase in muscle strength is an important factor for the effectiveness of the long jump based on the ability of muscle, where strength training is working on characterization of the appropriate amount of force for the development of speed and capacity, and that the use of the exercises in style mass added is horizontal jump (Mohamed Mahmoud Abdel Dayem et al, 1993). Can also be noted that the exercises used during the training modules have a Ambusher impact on the ability achieved the legs that "the ability to produce the largest muscle strength in less time after prolong in inverse movement to the basic direction of motion to be implemented Naji happiest, 1999. Also shown in the table (9) that both the control and experimental groups have achieved statistically significant differences between the results of tribal and post tests and in favor of the post test. Attribute the researchers evolution is the result of exercises tailored according to law mechanic is inertia contained confirmed to develop a recipe explosive power and range of motion and the highest percentage of elongation of the muscle, which led to that the muscle to produce the energy required to cause contraction muscle fast any that "there is interdependence between speed kinetic and muscular work which is the results of the implementation of the directives of the nervous system that have been a source of evolution. "(Ahmed Abdel Fattah Abu El-Ela, Ahmed Naseeruddin,1993). For the purpose of access in the performance of the skill well, they need a longer period of training because muscular stamina is "the ability of a muscle or muscle group to continue to fatigue and performance of muscle contractions in a row to overcome the resistance of the intensity of Average and less than the maximum"(Osama full salary, 1999). Also shown in the table (Hakkinen, Komi 1983) that there are differences "correlation between the results of post-test for Group Search (control and experimental) and in favor of the experimental group reason that what has to get it from the improvement and development of all the variables for the transport kinetic, quickly starting and angles of departure and the direction and to initiate, and the consequent player's performance moves in the form in which it Connected and high sequential and smoothly through the influence of each variable in the other and achieve optimal performance that serves the target of the effectiveness of mechanical long jump, As that of the most important characteristics of the long jump has a clear goal and a specific level in the sense that it is not enough to be a player property the ability to performance, but must be performance at a level commensurate with the connotations standard for this event, and this is one of the tasks pursued by biomechanics to access effective to top level permitted by the physical abilities and mechanical influential aspects in the performance of the player influential (Abdul Karim al-Fadhli, 2010).

Conclusions

1. there were significant differences between tribal and post tests of the experimental group in the electrical planning indicators of the working muscles and favor post tests;

2. there were significant differences between tribal and post tests for the control group in the electrical planning indicators of the working muscles and for testing post tests;

3. the presence of significant differences in dimensional tests between the experimental and control groups in the electrical planning indicators of the muscles working in favor of the experimental group;

4. there are significant differences between tribal and post tests of the experimental group in some kinmetekih variables and achievement favor post tests;

5. significant differences between tribal and post tests for the control group in some kinmetekih variables and achievement favor post tests;

6. the presence of significant differences in dimensional tests between the control and experimental groups some kinmetekih variables and achievement in favor of the experimental group.

Recommendations

In the light of the above conclusions the researchers recommended the following:

1. confirmation of the application of the exercises according to the law mechanical (inertia) for the development of the neuromuscular activity of the lower limbs during the training modules;

2.confirmation of the use of electric planning of the muscles (EMG) and various muscles to see the main factors that affect the achievement of high and low level of muscle activity as a result of improvement or landing in the level of duty kinetic;

3. use electrical planning for other muscle groups to find out what occurs to the muscle of the changes and some mechanical variables and achievement;

4. necessary to analyze the work of working every muscle and versus her work to ensuring their development.

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PERIODIZATION STUDY ON SOCCER UNIVERSITY TEAM

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Abstract
Purpose. Periodization is an offer made by Tudor Bomba and it's a methodological approach applied in order to obtain the training aims required for the predetermined competitive levels. The subject matter of the research is to verify the conditional improvements after the training time and the check of the moment of the peak performance during the evaluation time.
Methods. Periodization is based on the rise of the progressive load applied in training sessions, in order to allow the adaptation of the nervous system and therefore obtain improvements that affect the quantitative aspect.
Results. The results it is observed that both athletes get the strength's improvements, they attain peak performance at the beginning of the competitive period.
Conclusions. The object of this research, verified the improvements on a quantitative level, is to lay the foundations for new training methods whose don't forecast total separation between qualitative and quantitative features of training, but that fit together everything in unique sessions and exercises of training.
Keywords: Periodization, Quantitative features, Peak performance.

Introduction

Soccer is a sport about situation, influenced by many variables like pitch, adversary, teammates and presence of ball (gear).

In this sport the aspects concerning significantly the training are: physical, psychological and technical – tactical aspects.

Team sport activity is composed of conditional, technical, tactical features of performance and uses the periodization to put in practice strategies methods and teachings to develop the abilities of the individual and the collective group with the aim to get the best goals. The subject developed focuses on the concept of periodization, which means the division of the training season in specific periods with clearly defined aims The periodization includes the division of the training year in specific periods with well-defined aims. This ideal planning arises under the Sovietic union by Matveev, who used this method to the preparation of Olympic athletes.

Periodization is an offer made by Tudor Bomba and it's a methodological approach applied in order to obtain the training aims required for the predetermined competitive levels.

At the base of periodization, there is the "principle of progressivity of cargo and physiological adaptation".

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The exercises during the strength training are designed in order to reproduce the technical model in soccer such as tracing movements similar to it, to be executed repeatedly, in order to facilitate the learning .
The imitation of technical skills involves the chain of muscles in a way similar to the one used in the analyzed discipline. The exercises and training methods, therefore, must be directed to the movements or the situation that emulate in the match, so as to increase the discharge of motor neurons and to induce the muscles to express athletic movements made of high power and speed .
During training the nervous adaptation of the strength improves the power and the speed contraction of the muscle evading the growth of the mass. Therefore, The exercises and methods of the training will be directed to movements emulated during the match of the discipline, in order to increase the shock of the motor-neurons and to persuade the muscles to express the athletic movements with high power and speed (Di Tore et al., 2011).
These methods have been proposed again to the seniors teams of the Portuguese academic championship that it is followed.
During the periodization must coexist:

1) Individual and team improvement
2) Short, medium, long-run of work development
3) The turnover of load and unload phases
4) Contemporary improvement of motors and cognitive abilities
5) The achievement of peak performance in the characterized competitive time.

The periodization in team sports is divided this way:

1) The introductive phase which is necessary to the general rehabilitation of psychophysical fitness. This time is indicated for young and old athletes of medium and high level.
2) Loading phase, where the amount of work prevail on its intensity. It has to be predicted during the championship downtimes or in conjunction with secondary prestige matches. The purchase of technical abilities will be able to reveal very hard due to an eventual condition of fatigue. The most important aim of this phase is to develop the highest strength level possible. The most sport discipline request strength, muscular strength or both. For each of these types of strength is decisive the highest level of strength , because without it the strength can't develop.
3) Special or transformation phase is necessary to increase the work intensity and to develop a growing technical work. It coincides with matches of medium importance approaching to the decisive moments,play off. The primary purpose of this phase is to change the results achieved thanks to the training for the highest strength in those specific technical skills which are necessary to the match. Depending on the characteristics of a discipline, the highest strength will have to be converted into power or in muscular strength, or both, as happens in soccer. This aim is reached gradually over a period of 6-8 weeks.
4) Competitive phase: It's the moment where the reaching and the conservation of the highest peak performance are gained on the occasion of the most important matches. The performance peak cant' be kept for long periods and will be necessary the best precision from the trainer to program the reaching of this stage. The principal purpose of the power training in this phase is to keep the standard gained in the previous phases.
5) Transition phase: It coincides with a long pause between a competitive season and the other to regenerate the body.

The subject matter of the research is to verify the conditional improvements after the training time and the check of the moment of the peak performance during the evaluation time.

Method

Team sport activity is composed of conditional, technical, tactical features of performance; these 3 features have been improved during in the periodization phases; ; regarding quantitative features, according to the principle of the progressive increase of load ; regarding qualitative feature the improve has been obtain increasing the complexity of the technical and tactical exercises proposed, starting from cognitive exercises (step by step) , coming to propose ecological-dynamic exercises that aim to reproduce the same part of the match, whit all the different variable that it can show, having improves regarding the reaction-time, whit aim to reply for the better to the different incitements participating to the match, and therefore improving the single and collective performance . this research doesn't concern the quantitative features because tests won't executed to obtain scientific information which shows the improves .in football and in the disciplines based on power and speed, whose

provide quick actions and explosive movements, many exercises of power and maximal loads burden on the nervous system training, whose have the object to obtain an adaptation of the nervous system. The study has been realized in the University of Porto (Universidade do Porto) and the University of Salerno (Università degli studi di Salerno) , during the Erasmus project. The study has been conducted on the activity of two 22 years old males athletes of a Soccer Team of University Portuguese League, through the test of Maximum Strength and endurance strength, which helped us to evaluate the improvements of physical performances at different stages of periodization.
Different athletic tests have been executed For the survey of the improvements during the different phases of the periodization training.

The Tests have been carried out:
1) At the beginning of the preparatory period
2) At the end of the period of load
3) At the end of the period of transformation (which coincides with the start of the competitive period)
All tests allow us to find the quantitative improvements achieved.
The tests are:
1) Test of endurance and strength (curl up; push-up;
2) Test of FM.
3) VO2 Max (Cooper's test).
Subsequently, the data, collected during the research, were submitted to a statistical study. The latter showed us the physical performance trend in the different training periods during a season.

Results

Tables 1. General data of athlete 1, 1.b.strenght tests.

General data			
age:		22	
height:		194,00	
Periods examined →	**Preparatory period 02/07/2012**	**The End of the load period 06/09/2012**	**The end of the processing period 22/10/2012**
Weight	82 kg	80 kg	84 kg
Resting heart rate(FC Repose)	55	57	56
Heart rate after exercise (FC Máxima)	198	198	188
Abdominal strength (curl-up).	46,00 rep	56,00 rep	59,00 rep
Superior Force Members (push-ups)	22,00 rep	29,00 rep	32,00 rep
Lower limb strength (half squat)	80 kg	108 kg	124 kg
Cooper's test			
meters	2960	3220	3440
Value	61,15 ml/Kg	47,51 ml/Kg	73,67 ml/Kg

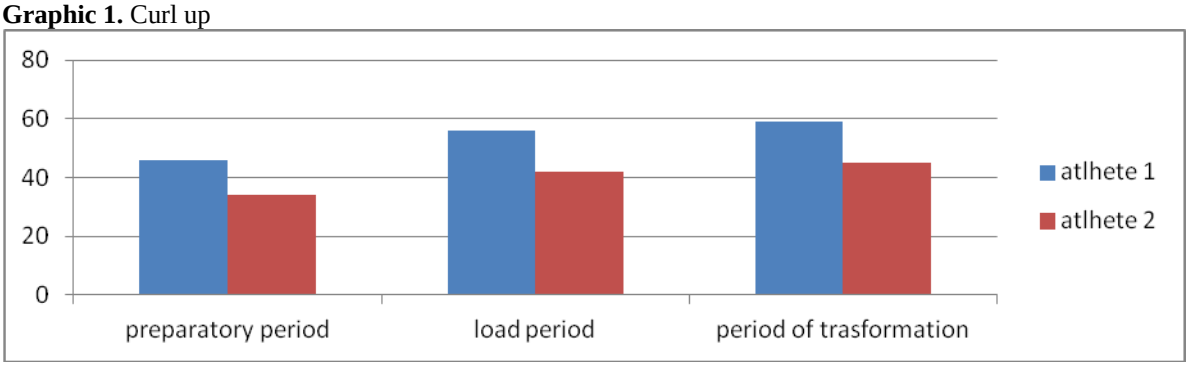
Result	EXCELLENT	EXCELLENT	EXCELLENT

Table2. General data of athlete 2, 2.b.strenght tests.

general Data			
Age		22	
Height		174.00	

Periods examined →	**Preparatory period 02/07/2012**	**The End of the load period 06/09/2012**	**The end of the processing period 22/10/2012**
Weight	71,00	70,00	68,00
Resting heart rate(FC Repouso)	57	62	56
Heart rate after exercise (FC Máxima)	198	198	188
Periods examined →	Preparatory period 02/07/2012	The End of the load period 06/09/2012	The end of the processing period 22/10/2012
Abdominal strength (Curl-up)	34,00 rep	42,00 rep	45,00 rep
Superior Force Members (push-ups)	23,00 rep	30,00 rep	32,00 rep
Lower limb strength (half squat)	81 kg	108 kg	114 kg
Cooper's test			
meters	2234	2620	3013
Value	41,70 ml/Kg	47,51 ml/Kg	53,55 ml/Kg
Result	Average	good	EXCELLENT

Graphic 1. Curl up



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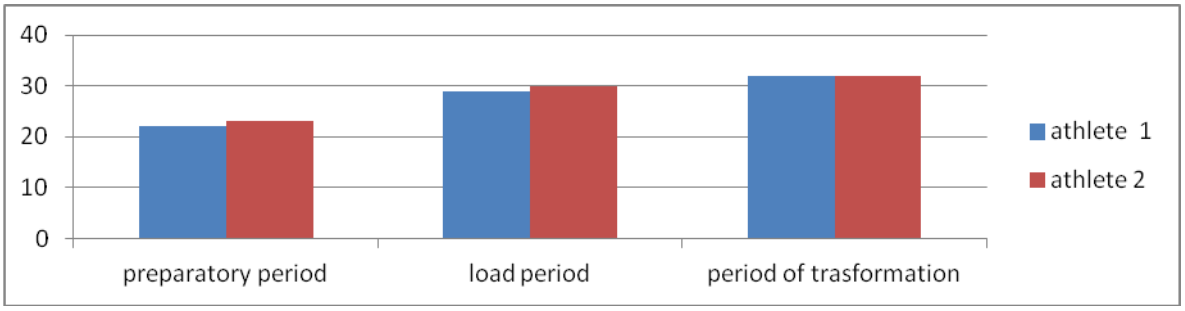
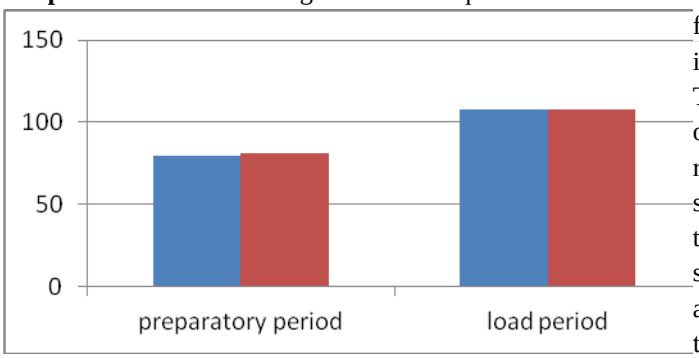
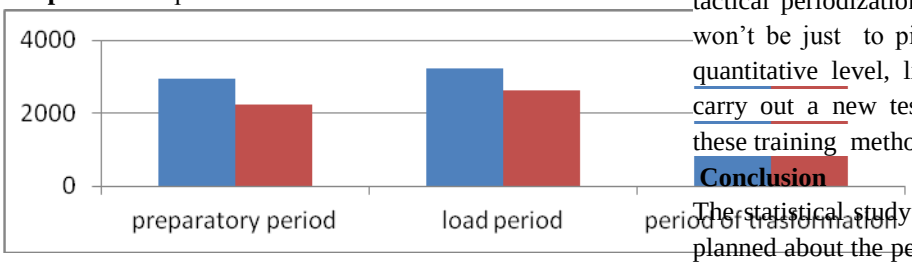
Graphic 2. Push up



Graphic 3. Maximum strength test - half squat



Graphic 4. Cooper's test



Discussion

The informations, collected during research, have been subjected to a statistical studying ,that whose show the evolution of the physical performance during the different training phases over the year, showing how the planning of the training, carried out thanks to the assistance of the method of periodization, allow us to reach the peak performance over the prearranged period that in football is equivalent to the most important match of the year which is part of the competitive year.

It's important, therefore, the principle progressive increase of load and complexity of the proposed exercises, whose allow the nervous system to adapt itself in a gradually way to identify improvements on a quality level. The progressive growth is also important for the prevention of the athletes from possible injuries.(the 2 athletes not have suffered injuries).

The object of this research, verified the improvements on a quantitative level, is to lay the foundations for new training methods whose don't forecast total separation between qualitative and quantitative training, but that fit together everything in unique sessions and exercises following as training model the applied methods of Josè Mourinho (f.c.Real Madrid trainer) and of his staff, who don't talk just about periodization on a conditional level, but also about tactical periodization. The aim of the future studying won't be just to pick up scientific information on a quantitative level, like for this research, but also to carry out a new tests to show the improvements of these training methods on a qualitative level.

Conclusion

The statistical study demonstrated us how the training planned about the periodization, allowed the athletes to reach the "peak performance" within the period, in which there is, usually, the most important match of the whole season which is part of a competitive period. The studying object is to prove the conditional improvement after the training time and the prove of the peak performance during the proving time (competitive time).

The whole completion is conditioned by the multiple aspects of quantitative and qualitative way. Thus, it has been established that the good way is the integrated and complex teaching method (Raiola 2008). So on, it could be useful to improve the ecological-dynamic approach in didactics for all level of competition. The specialization of quantitative aspects in soccer has to follow in according to a entire phenomenon of empowerment of the athletes and of performance analysis principles.

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PERFORMANCE POSSIBILITIES OF THE COMBINED PENTATHLON EVENT AT THE NATIONAL INDOOR ATHLETICS CHAMPIONSHIP

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Abstract

*Aim.*The aim of this research is to underline the dynamics of the results recorded on sports categories ranging from women junior III to women senior, in pentathlon events, at a national level.

*Materials and methods.*This paper is based on a study based on records gathered from 38 woman athletes practising combined events. This study was performed in February 2013. Their performances at the pentathlon events (60 m hurdles, high jump, 4-kg discus throw, long jump, 800m run) were evaluated by judges with special and advanced equipment and devices, recorded and published on the site of the Romanian Athletics Federation.

Results .The results are summarized on age categories, presented in 6 tables and graphically designed. They are analyzed according to their age categories (senior, youth, junior I, junior II and junior III), but also according to the general scores of the competitors and their performances during the five events and they highlight our women athletes' performance possibilities.

*Conclusions.*The conclusions drawn underline the following facts: the number of clubs which train women athlets practising combined events is reduced (20 clubs); the number of participants (38 contestants) is rather small; their age has a wider range for seniors (born between 1986- 1995) and is narrower for juniors III (born between 1998 and 1999); the scores recorded by the competitors at each event present rather great differences, 292 points for seniors, 324 points for youth and junior I and 329 points for juniors II and III. In addition, we noticed that the highest score was recorded at the 60 m hurdles event, which was of 1021 points (seniors), and the lowest one was recorded at 4 kg discus throw event, which was of 507 points (junior III). The hypothesis according to which the final score in the pentathlon is progressive from juniors III to senior was confirmed and is mainly influenced by the closest values recorded at all the five contest events.

Key words: pentathlon, possibilities, performances.

Introduction

The king of the Olympic sports, athletics, includes an exceptional event which can be found both in men's and women's competition. On stadiums and in halls set up with tracks and field sections, combined events offer the most pleasant and exciting display of power, harmony, strength, perserverence, physical and moral beauty. Sports performance is defined as "a bio-psycho-social value achieved in an official competition, as a result of a capacity multiply determined and assessed, based on some criteria and scales rigurously established" (according to Dragnea, 1999). Great sports competitions, for example competitions specific to national championships, are previously prepared. Combined events, in our case indoor pentathlon, including 60 m hurdles, high jump, discus throw, long jump and 800m run imply on the one hand, training for improving an execution

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technique and on the other hand, developing the level of abilities for psychological training and tactics to approach competition. The pentathlon's result coming from adding the points for the individual performances, for each of the five events, depends on the way and level of training for each of these during practice. The performance capacity at the combined events depends on the one hand on the training process, and on the other hand, on the physical, motor and psychical predispositions. Reaching sports performance "requires a great number of repetitions, avoiding using the same tempi and promoting an analytical method to approach it" (Pradet, 1996 and Duray, 1997), but in the combined events, training is characterized by diversity, variability and complexity. The challenge in the pentathlon competion means physical and psychical strain, extended but variable. The sports result in pentathlon is the product of some great efforts in several events, all characterized by increased indices of speed and rapid strength. "The exploitation of the speed potential depends on the practical-methodological mastery of every specialized teacher" (Ardelean, 1991), therefore, also on the manner in which the technical instruction is performed and how the performance development of the respective technique is approached by increased indices of speed, strength, coordination and endurance. The pentathlon event, comprising five events, is characterized by these indices, but also by "competitional strains which imply high movement and action speeds" (Bauersfeld, 1988) under the pressure of endurance. The sports result in a combined event in athletics "comes from an objective sequence and combination, from reactive changes to stable adjustments" (Solodkov, 1990), but also from the manner of participation within the competition and the individual features of every contestant. For a sportsman, "a high qualification [...] is highlighted by a great stability" (Tschiene, 1988), and in a pentathlon, stability means getting better results at every event.

Materials and methods

For this research we used several methods, such as: bibliographic study, testing, statistics and graphics. The assessment was based on the results recorded by the women athletes participating in the Indoor National Athletics Championship. The performances at the pentathlon event (60 m hurdles, high jump, 4 kg discus throw, long jump, 800 m run) were measured by judges, with special and advanced equipment and devices, recorded and published on the site of the Romanian Athletics Federation. As *subjects*, we chose a group of 38 women athlets, participating at the Indoor National Athletics Championship – Combined events which took place in Bucharest during February 17th-18th, 2013. The evaluation of the competitional dynamics was made based on the analysis of the individual results (sports performances and scores) which the women athlets received at all five competition events (60 m hurdles, high jump, 4 kg discus throw, long jump, 800 m run) during the two rounds of the competition. The hypothesis, which aims to explain and present certain aspects, starts from the supposition that the final score in pentathlon events is progressive from juniors III to seniors and is mainly determined by the closest values recorded at all five competition events.

Results

The data gathered at National Championship – Combined event for S,T,J1,J2 and J3, which took place in a hall from the "Lia Manoliu" Sports Complex, during February 17th-18th, 2013, were listed and can be found in the following 6 tables (table no. 1, 2, 3, 4 5 and 6). We can observe the range from the youngest women participants (Juniors III) to the eldest (Seniors).

1. Analysis of results for women seniors

Table no. 1 – Results for women seniors' group

Crt. no	I.	Club	YoB.	Events												Total points
				60m hurdles			High jump		Discus throw		Long jump		800 m run			
				R (s)	Mov. Speed (m/s)	P	R (m)	P	R (m)	P	R (m)	P	R	Mov. Speed (m/s)	P	
1	P. B	CSU Cluj, CSA Steaua	86	8.48	7.07	1021	1.81	991	13.51	761	6.14	893	147.16	5.43	729	4395
2	P.E	LNPA Câm.-L M. CSM Oneşti	95	9.08	6.60	893	1. 72	879	10.60	569	5.64	741	147.73	5.42	722	3804
3	N. J	CSA Steaua	89	8.95	6.70	920	1.63	771	11.68	640	5.72	765	149.06	5.36	705	3801
4	L. G	LPS Cluj	95	9.63	6.23	783	1.72	879	11.04	598	5.35	657	153.53	5.21	649	3566
5	Z. G	CS Rapid	88	9.53	6.29	802	1.78	953	8.64	441	5.20	614	168.07	4.75	484	3294
6	B. S	AA. C. Iacris Buc	95	9.47	6.47	854	1.45	566	7.76	384	5.23	623	148.60	5.38	711	3138
7	C. T	LNPA Campu L.	94	9.70	6.18	769	1.48	599	9.56	501	4.83	514	162.51	4.92	544	2927

		M													
8	L. A	LPS Cluj	93	10.29	5.83	659	1.45	566	8.67	443	5.06	576	152.89	5.23	657	2901
9	P. M	Col. Naț. Onic. Sud 190 Buc.	95	10.03	5.98	706	1.51	632	9.36	488	4.48	423	158.67	5.04	588	2837
10	M. V	LPS Cluj	95	10.06	5.96	701	1.42	534	8.68	443	4.42	408	164.85	4.85	519	2605
11	J. DI	LNPA Cl. Mus.	95	9.84	6.09	742	1.42	534	8.89	457	4.74	490	179.54	4.46	369	2592
12	V. A	CSM Sibiu	93	9.63	6.23	783	1.48	599	8.29	418	5.19	612	0	0	0	2412
X = arithmetic mean				9.55	6.30	802.75	1.55	708.5	9.72	511.91	5.16	609.66	157.51	4.67	607	3189.33
S = standard deviation				0.51	0.35	103.63	0.15	173.99	1.67	109.77	0.51	142.77	10.33	0.32	116.89	598.46
V. max = maximum value				8.48	7.07	1021	1.81	991	13.51	761	6.14	893	147.16	5.43	729	4395
V. min = minimum value				10.29	5.83	659	1.42	534	7.76	384	4.42	408	179.54	4.46	369	2412

*****Legend: I= subjects' initials, YoB. = year of birth, R= result, S. mov. m/s= movement speed in metres per second, P= points X = arithmetic mean, S = standard deviation, V. max = maximum value, V. min = minimum value and CV = coefficient of variability.

In the competition for medals at the women senior category (table no 1), 12 women athletes participated, coming from 8 different sports clubs and born between 1986-1995, athletes who reached total scores between 2412 and 4395 points. Out of the 12 women athlets, the last one missed the 800m run event, which made us take into account the results of the rest 11 women athlets.

The results recorded and presented in the table no. 1 underline the following aspects:

- at the 60m speed hurdles, the recorded timing has an average value of 9.55 s, with extreme values of 10.29 and 8.48 seconds, the movement speed recorded a mean of 6.30 m/s with extreme values of 7.07 and 5.83 m/s, and the corresponding score has an average value of 802.75 points with extreme values of 659 and 1021 points;

- at the high jump event, the height of the jump has an average mean of 1.55m, with extreme values of 1.42m and 1.81m, and the corresponding score has an average value of 708.5 points with extreme values of 534 and 991 points;

- at the 4kg discus throw, the length of the throw has an average value of 9.72m, with extreme values of 7.66m and 13.51 m, and the corresponding score has an average value of 511.91 points with extreme values of 384 and 761 points;

- at the long jump event, the length of the jump has an average value of 5.16m, with extreme values of 4.42m and 6.14m, and the corresponding score has an average value of 609.66 points with extreme values of 408 and 893 points;

- at the 800m endurance run, the recorded timing has an average value of 157.51 s, with extreme values of 179.54 and 147.16 seconds, the movement speed recorded a mean of 4.67m/s with extreme values of 4.46 and 5.43m/s, and the corresponding score has an average value of 607 points with extreme values of 368 and 729 points.

2. Analysis of results for girls youth

Table no. 2 – Results for the group of girls youth

Crt. No.	I.	Club	YoB	Events												Total points
				60m hurdles			High jump		Discus throw		Long jump		800 m run			
				R (s)	Mov. Speed (m/s)	P	R (m)	P	R (m)	P	R (m)	P	R	Mov. Speed (m/s)	P	
1	P. E	LNPA Câmpu L M, CSM Onești	95	9.08	6.60	893	1. 72	879	10.60	569	5.64	741	147.73	5.42	722	3804
2	L.G	LPS Cluj	95	9.63	6.23	783	1.72	879	11.04	598	5.35	657	153.53	5.21	649	3566
3	B. S	AA. C. Iacris Buc	95	9.27	6.47	854	1.45	566	7.76	384	5.23	623	148.60	5.38	711	
4	C. T	LNPA Câmpu L M	94	9.70	6.18	769	1.48	599	9.56	501	4.83	514	162.51	4.92	544	2927
5	L. A	LPS Cluj	93	10.29	5.83	659	1,45	566	8.67	443	5.06	576	152.89	5.23	657	2901
6	P. M	Col. Naț. O. Onic. Sud 190 Buc.	95	10.03	5.98	706	1.51	632	9.36	488	4.48	423	158.67	5.04	588	2837
7	M V	LPS Cluj	95	10.06	5.96	701	1.42	534	8.68	443	4.42	408	164.85	4.85	519	2605
8	J DI	LNPA Cl. Muscel	95	9.84	6.09	742	1.42	534	8.89	457	4.74	490	179.54	4.46	369	2592
9	V A	CSM Sibiu	93	9.63	6.23	783	1.48	599	8.29	418	5.19	612	0	0	0	2412
X = arithmetic mean				9.73	6.17	765.56	1.49	643.11	9.21	477.89	4.99	560.44	158.54	5.06	594.88	2955.50
S = standard deviation				0.38	0.25	74.42	0.10	137.39	1.06	69.50	0.41	110.67	10.48	0.32	117.01	487.10
V. max = maximum value				9.08	6.60	893	1.72	879	11.04	598	5.64	741	147.73	5.42	722	3804
V. min = minimum value				10.29	5.83	659	1.42	534	7.76	384	4.42	408	179.54	4.46	369	2412

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In the competition for medals at the girls youth category (table no 2), 9 athletes participated, coming from 6 different sports clubs and born between 1995-1993, athletes who reached total scores between 2412 and 4395 points. Out of the 9 women athlets, one missed the 800m run event.

The results recorded underline the following aspects:

- at the 60m speed hurdles, the recorded timing has an average value of 9.73s, with extreme values of 10.29 and 9.08 seconds, the movement speed recorded a mean of 6.17 m/s with extreme values of 5.83 and 6.60 m/s, and the corresponding score has an average value of 765.56 points with extreme values of 659 and 893 points;
- at the high jump event, the height of the jump has an average mean of 1.49 m, with extreme values of 1.42m and 1.72 m, and the corresponding score has an average value of 708.5 points with extreme values of 534 and 879 points;
- at the 4kg discus throw, the length of the throw has an average value of 9.21 m, with extreme values of 7.76 m and 11.04 m, and the corresponding score has an average value of 477.89 points with extreme values of 384 and 598 points;
- at the long jump event, the length of the jump has an average value of 4.99 m, with extreme values of 4.42m and 5.64 m, and the corresponding score has an average value of 560.5 points with extreme values of 408 and 741 points;
- at the 800m endurance run, the recorded timing has an average value of 158.54 s, with extreme values of 179.54 and 147.73 seconds, the movement speed recorded a mean of 5.06 m/s with extreme values of 4.46 and 5.42m/s, and the corresponding score has an average value of 594.88 points with extreme values of 369 and 722 points.

In the competition for medals at women juniors I (table no 3), 9 athletes participated, coming from 7 different sports clubs and born between 1995- 1993, athletes who reached total scores between 2592 and 3804 points. Out of the 9 women athlets, only one is her second year of activity and two were not included in the youth and senior competition.

The results recorded underline the following aspects:

- at the 60m speed hurdles, the recorded timing has an average value of 9.65 s, with extreme values of 10.29 and 9.08 seconds, the movement speed recorded a mean of 6.22 m/s with extreme values of 5.96 and 6.60 m/s, and the corresponding score has an average value of 780.11 points with extreme values of 701 and 893 points;
- at the high jump event, the height of the jump has an average mean of 1.52 m, with extreme values of 1.42m and 1.72 m, and the corresponding score has an average value of 669.56 points with extreme values of 534 and 879 points;
- at the 4kg discus throw, the length of the throw has an average value of 9.36 m, with extreme values of 7.76 m and 11.04 m, and the corresponding score has an average value of 488 points with extreme values of 384 and 598 points;
- at the long jump event, the length of the jump has an average value of 5.01 m, with extreme values of 4.42m and 5.64 m, and the corresponding score has an average value of 566.22 points with extreme values of 408 and 741 points;
- at the 800m endurance run, the recorded timing has an average value of 159.22 s, with extreme values of 179.54 and 147.73 seconds, the movement speed recorded a mean of 5.15 m/s with extreme values of 4.85 and 5.45m/s, and the corresponding score has an average value of 586.11 points with extreme values of 369 and 722 points.

3. Analysis of results for women juniors I

Table no. 3 – Results for the group of women juniors I

Crt. No.	I.	Club	YoB	Events: 60m hurdles R (s)	60m hurdles Mov. Speed (m/s)	60m hurdles P	High jump R (m)	High jump P	Discus throw R (m)	Discus throw P	Long jump R (m)	Long jump P	800 m run R	800 m run Mov. Speed (m/s)	800 m run P	Total points
1	P. EA	LNPA Câmpu L M., CSM Oneşti	95	9.08	6.60	893	1. 72	879	10.60	569	5.64	741	147.73	5.41	722	3804
2	L G	LPS Cluj	95	9.63	6..23	783	1.72	879	11.04	598	5.35	657	153.53	5.21	649	3566
3	AAR	CSM Focşani	95	9.56	6.27	796	1.63	771	8.56	436	5.16	603	159.54	5.01	578	3184
4	BFl	CSS 5 Bucuresti	95	9.66	6.21	777	1.51	632	9.80	516	5.28	637	158.05	5.06	595	3157
5	B SE	AA C. Iacris Buc	95	9.27	6.47	854	1.45	566	7.76	384	5.23	623	148.60	5.38	711	3138
6	C TF	LNPA Cl. M	94	9.70	6.18	769	1.48	599	9.56	501	4.83	514	162.51	4.93	544	2927
7	PMD	Col.Naţ.O.Onic. Sud 190 Buc.	95	10.03	5.98	706	1.51	632	9.36	488	4.48	423	158.67	5.04	588	2837
8	M V	LPS Cluj	95	10.06	5.96	701	1.42	534	8.68	443	4.42	408	164.85	4.85	519	2605
9	J DI	LNPA Cl. M	95	9.84	6.09	742	1.42	534	8.89	457	4.74	490	179.54	5.45	369	2592
X = arithmetic mean				9.65	6.22	780.11	1.52	669.56	9.36	488	5.01	566.22	159.22	5.15	586.11	3090

S = standard deviation	0.32	0.22	63.05	0.11	138.43	1.03	67.19	0.42	113.17	9.58	0.22	106.99	407.09
V. max = maximum value	10.06	6.60	893	1.72	879	11.04	598	5.64	741	179.54	5.45	722	3804
V. min = minimum value	9.08	5.96	701	1.42	534	7.76	384	4.42	408	147.73	4.85	369	2592

4. Analysis of results for women junior II

Table no. 4 – Results for the group of women juniors II

Crt. No.	I.	Club	YoB	Events: 60m hurdles R (s)	60m hurdles Mov. Speed (m/s)	60m hurdles P	High jump R (m)	High jump P	Discus throw R (m)	Discus throw P	Long jump R (m)	Long jump P	800 m run R	800 m run Mov. Speed (m/s)	800 m run P	Total points
1	AGI	SCM Bacau	99	9.36	6.41	836	1. 52	644	9.66	507	5.52	706	154.86	5.16	633	3326
2	B A	SCM Bacau	96	9.58	6.26	792	1.70	855	8.18	411	5.05	573	152.32	5.25	664	3295
3	D C	LPS Cluj	97	9.39	6.38	830	1.58	712	8.62	440	5.23	623	151.32	5.28	576	3281
4	TAM	CSS Olimpia Buc	97	9.73	6.16	763	1.61	747	10.84	585	5.11	589	160.18	4.99	571	3255
5	ALA	LPS Cluj	97	9.64	6.22	781	1.52	644	8.78	450	4.90	532	142.92	5.59	784	3191
6	ORG	CSM Sibiu	97	9.63	6.23	783	1.49	610	9.82	518	5.32	648	169.40	4.72	473	3032
7	VES	AA. C. Iacris Buc	96	9.27	6.47	854	1.42	512	8.70	451	4.99	557	160.04	4.99	572	2946
8	PDC	CSS Lugoj	98	9.49	6.32	810	1.40	512	8.28	417	5.34	654	172.37	4.64	439	2832
9	AAI	CSS Pandurii Tg. Jiu	99	10.30	5.82	657	1.55	678	7.20	348	4.88	525	162.05	4.93	550	2760
10	BAM	CSS Şoimii Sibiu	97	10.08	5.95	697	1.58	712	7.79	386	4.60	454	168.74	4.75	477	2726
11	RDM	AA C. Iacris Buc	97	9.76	6.14	758	1.58	712	7.07	340	4.68	474	175.94	4.54	404	2688
12	T A	CSS Bacau	98	10.60	5.66	604	1.58	712	6.36	294	4.86	522	161.79	4.94	553	2685
13	T V	CSM Focşani	96	10.46	5.73	629	1.37	481	10.04	532	4.82	511	180.52	4.43	251	2513
14	PDA	LPS P.T. Craiova	99	10.16	5.90	682	1.40	512	6.99	334	4.64	464	173.07	4.62	432	2424
15	AAM	LPS Roman	98	10.24	5.85	668	1.49	610	6.52	304	4.26	369	173.12	5.62	432	2383
16	DAE	CSS 7 Dinamo Buc.	99	9.83	6.10	744	1.34	449	6.83	324	4.72	485	193	4.14	254	2256
17	MNM	LPS Cuj Napoca	98	10.83	5.54	565	1.22	331	7.27	352	4.15	343	160.33	4.98	569	2160
18	SAM	LPS Roman	99	12.32	4.87	340	1.37	481	6.21	285	4.46	418	178.71	4.47	377	1901
X = arithmetic mean				10.04	6.00	710.72	1.48	606.33	8.06	404.33	4.86	524.83	166.15	4.89	500.61	2758.56
S = standard deviation				0.73	0.39	125.00	0.12	131.27	1.38	89.58	0.37	98.12	12.26	0.40	135.56	427.20
V. max = maximum value				12.32	6.47	854	1.70	855	10.84	585	5.52	706	193	5.62	784	3326
V. min = minimum value				9.27	4.87	340	1.22	331	6.21	285	4.15	343	142.92	4.14	251	1901

In the competition for medals at women juniors II (table no 4), 21 athletes participated, coming from 10 different sports clubs and born between 1996- 1999, athletes who reached total scores between 1901 and 3326 points. Out of the 21 women athlets, three were disqualified or abandoned one or two events during the competition.

The results recorded underline the following aspects:

- at the 60m speed hurdles, the recorded timing has an average value of 10.04 s, with extreme values of 12.32 and 9.27 seconds, the movement speed recorded a mean of 6.00 m/s with extreme values of 4.87 and 6.47 m/s, and the corresponding score has an average value of 710.72 points with extreme values of 340 and 8541 points;

- at the high jump event, the height of the jump has an average mean of 1.48m, with extreme values of 1.22m and 1.70 m, and the corresponding score has an average value of 606.33 points with extreme values of 331 and 855 points;

- at the 4kg discus throw, the length of the throw has an average value of 8.06 m, with extreme values of 6.21 m and 10.84 m, and the corresponding score has an average value of 404.33 points with extreme values of 285 and 585 points;

- at the long jump event, the length of the jump has an average value of 4.86 m, with extreme values of 4.15 m and 5.52 m, and the corresponding score has an average value of 524.83 points with extreme values of 343 and 706 points;

- at the 800m endurance run, the recorded timing has an average value of 166.15 s, with extreme values of 193 and 147.92 seconds, the movement speed recorded a mean of 4.89 m/s with extreme values of 4.14 and 5.62 m/s, and the corresponding score has an average value of 500.61 points with extreme values of 251 and 784 points.

5. Analysis of results for women juniors III

Table no. 5 – Results for the group of women juniors III

Crt. No.	I.	Club	Y.o.b.	Events: 60m hurdles R	60m hurdles Mov.	60m hurdles P	High jump R	High jump P	Discus throw R	Discus throw P	Long jump R	Long jump P	800 m run R	800 m run Mov.	800 m run P	Total points

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				(s)	Speed (m/s)		(m)		(m)		(m)			Speed (m/s)		
1	AGI	SCM Bacau	99	9.36	6.41	836	1. 52	644	9.66	507	5.52	706	154.86	5.16	633	3326
2	P D C	CSS Lugoj	98	9.49	6.32	810	1.40	512	8.28	417	5.34	654	172.37	4.64	439	2832
3	A A I	CSS Pandurii Tg. Jiu	99	10.30	5.82	657	1.55	678	7.20	348	4.88	525	162.05	4.93	550	2760
4	T A	CSS Bacau	98	10.60	5.66	604	1.58	712	6.36	294	4.86	522	161.79	4.94	553	2685
5	P D A	LPS P.T. Craiova	99	10.16	5.90	682	1.40	512	6.99	334	4.64	464	173.07	4.62	432	2424
6	A A M	LPS Roman	98	10.24	5.85	668	1.49	610	6.52	304	4.26	369	173.12	5.62	432	2383
7	D AE	CSS7 Dinamo Buc.	99	9.83	6.10	744	1.34	449	6.83	324	4.72	485	193.00	4.14	254	2256
8	MNM	LPS Cuj Napoca	98	10.83	5.54	565	1.22	331	7.27	352	4.15	343	160.33	4.98	569	2160
9	SAM	LPS Roman	99	12.32	4.87	340	1.37	481	6.21	285	4.46	418	178.71	4.47	377	1901
X = arithmetic mean				10.35	5.83	656.22	1.42	547.67	7.26	351.67	4.76	498.44	169.92	4.83	471.00	2525.22
S = standard deviation				0.88	0.46	148.12	0.12	122.90	1.09	70.29	0.46	121.09	11.63	0.43	116.62	424.56
V. max = maximum value				12.32	6.41	836	1.58	712	9.66	507	5.52	706	193	5.62	633	3326
V. min = minimum value				9.36	4.87	340	1.22	331	6.21	285	4.15	343	154.86	4.14	254	1901

In the competition for medals at women juniors III (table no 5), 11 athletes participated, coming from 7 different sports clubs and born between 1998- 1999, athletes who reached total scores between 1901 and 3326 points. Out of the 11 women athlets, two were disqualified at every event.

The results recorded underline the following aspects:

- at the 60m speed hurdles, the recorded timing has an average value of 10.35s, with extreme values of 12.32 and 9.36 seconds, the movement speed recorded a mean of 5.83 m/s with extreme values of 4.87 and 6.41 m/s, and the corresponding score has an average value of 656.22 points with extreme values of 340 and 836 points;

- at the high jump event, the height of the jump has an average mean of 1.42m, with extreme values of 1.22m and 1.58 m, and the corresponding score has an average value of 547.67 points with extreme values of 331 and 712 points;

- at the 4kg discus throw, the length of the throw has an average value of 7.27 m, with extreme values of 6.21 m and 9.66 m, and the corresponding score has an average value of 351.67 points with extreme values of 285 and 507 points;

- at the long jump event, the length of the jump has an average value of 4.76 m, with extreme values of 4.15 m and 5.52 m, and the corresponding score has an average value of 498.44 points with extreme values of 343 and 706 points;

- at the 800m endurance run, the recorded timing has an average value of 169.92 s, with extreme values of 193 and 154.86 seconds, the movement speed recorded a mean of 4.3 m/s with extreme values of 4.14 and 5.62 m/s, and the corresponding score has an average value of 471 points with extreme values of 254 and 633 points.

Discussions

Table no. 6 – Results of the 1st-place winners (women seniors, youth, juniors I, juniors II, juniors III)

Crt. No.	I.	Category	Y.o.B.	Events: 60m hurdles R (s)	60m hurdles Mov. Speed (m/s)	60m hurdles P	High jump R (m)	High jump P	Discus throw R (m)	Discus throw P	Long jump R (m)	Long jump P	800 m run R	800 m run Mov. Speed (m/s)	800 m run P	Total points
1	P. B	Women seniors	86	8.48	7.07	1021	1.81	991	13.51	761	6.14	893	147.16	5.43	729	4395
2	P. E	Women youth	95	9.08	6.60	893	1. 72	879	10.60	569	5.64	741	147.73	5.42	722	3804
3	P. EA	Women Juniors I	95	9.08	6.60	893	1. 72	879	10.60	569	5.64	741	147.73	5.41	722	3804
4	AGI	Women Juniors II	99	9.36	6.41	836	1. 52	644	9.66	507	5.52	706	154.86	5.16	633	3326
5	AGI	Women Juniors III	99	9.36	6.41	836	1. 52	644	9.66	507	5.52	706	154.86	5.16	633	3326

As it can be observed in table no. 6, in which the results of the five winners are presented, their age ranges from 27 to 14 years old. The champion title at youth was won by a junior I, and the title at juniors II was won by a junior III, this aspect underlining the lack of valuable sportswomen at youth category and at the level of juniors II, but also a low level of performance.

The results of the final scores which the winners got show a difference of 1069 points between women

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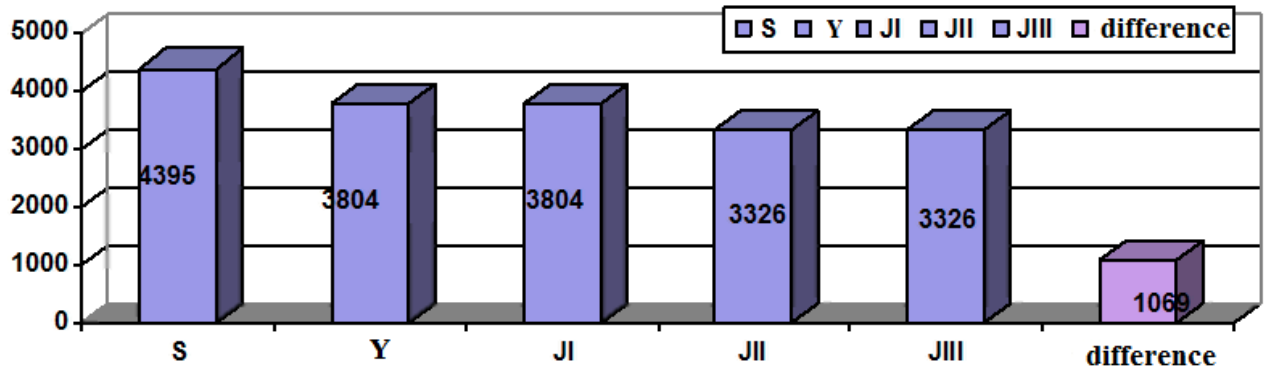
juniors III and seniors (graphic no 1), a normal aspect taking into account the age difference.

Graphic no 1- Winners' scores at the pentathlon (women seniors, youth, junior I, II and III)



The winners' scores at all the five events are between 1021 points at 60 m hurdles and 507 points at discus throw.

The highest scores were reached at 60m hurdles and they were 1021 points for women seniors, 893 points for youth and juniors I and and 836 points for juniors II and III, and the lowest were recorded at the 4kg discus throw and they were 761 points for women seniors, 569 points for youth and juniors I and 507 points for juniors II and III. At 800m run, we can also observe low scores of 729 points for seniors, 722 points for youth and juniors I and 633 points for juniors II and III. The scores which are between the high and low values were recorded at the high jump event and they were 991 points, 879 points for youth and juniors I and 644 points for juniors II and III, but also at the long jump event and they were 893 points for seniors, 741 points for youth and juniors I and 706 points for juniors II and III. The scores on events reveal very high differences among them, of 292 points for seniors, 324 puncte for youth and seniors and 329 points for juniors II and III.

Conclusions

Perfoming this study allowed us to present a series of aspects regarding the results of the women athlets practising combined events in a petathlon for the indoor competitional season.

The analysis and discussion of the results offer us the possibility to draw the following conclusions:

1. the number of clubs which train athletes practising combined events is reduced (20 clubs);
2. the total number of participants was low, reaching 38 participants out of which 34 managed to receive points at every event;
3. the competitors' age has a wider range for women seniors (born between 1986-1995) and is narrower for women juniors III (născute în 1998 şi în 1999);
4. the number of participants is higher for women juniors II (21 competitors) and lower for youth (9 competitors);
5. the scores recorded by the competitors at every event have rather high differences among them, namely 292 points for seniors, 324 points for youth and juniors I and 329 points for juniors II and III;
6. the highest score was recorded at the 60m hurdles event and it was 1021 points (seniors) and the lowest was recorded at the 4kg discus throw event and it reached 507 points (juniors III).
7. the hypothesis according to which the final score of pentathlon events is progressive from women juniors III to seniors was confirmed;
8. the hypothesis according to which reaching a higher score is influenced by the closest values recorded at the five events is also confirmed.

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TRAINING CHILDREN BEGINNERS IN HANDBALL

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Abstract
*Aim.*The great performances of Romanian handball have appeared as a result of scouting, sustained work and efforts and with a sense of responsibility of athletes and coaches. Studies have been performed both in our country as well an in others, with the goal of optimizing recruitment and training of children and juniors. It has been demonstrated that practicing handball from a young age contributes to learning and strengthening some specific motor skills which have an important role in obtaining performances. The goal of these studies was to develop a theory own methodical mass base of professional handball.
The development of selection and training models using selected and verified means at the ages of 8 to 10 leads to a better recruitment for beginners groups. For this purpose, efforts have been made to discover the most effective means to realize selection and training for handball and also incorporate and systematize these means in the teaching of the sport.
Method.Research was conducted on a group of 20 female athletes from the School Sports Club no. 1 Constanta.
To achieve the goal of the research, we used the experimental method, testing method and statistical method. After initial testing, we created specific operational methods and prepared the training planning. At the end of the experiment, a new test was realized, with the results being tabulated and statistically interpreted.
The results obtained after interpreting the data are a strong argument in favor of using adequate planning and means adapted to the needs of initiation in handball at the ages of 8 to 10.
*Conclusions.*Choosing a minimal, simplified game model using plenty of games, relays, contests, exercise structures similar to the game of handball shows that athletes progress faster and give certainty of future successes.
*Key words***:** handball, planning, training.

Introduction

Handball records at an international level a rise in preference among viewers because of its spectacularity and dynamic of the game. The great performances of Romanian handball have appeared as a result of the scouting, creativity and efforts of athletes and coaches. Studies have been performed both in our country as well an in others, with the goal of optimizing recruitment and training of children and juniors (Kunst-Ghermănescu and others 1983; Rizescu, 2008). It has been demonstrated that practicing handball from a young age contributes to learning and strengthening some specific motory skills which have an important role in obtaining performances. Studies

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have lead to the shaping and modernizing of a methodical mass base of professional handball. The development of selection and training models using selected and verified means at the ages of 8 to 10 leads to a better recruitment for beginners groups (Negulescu, 1998).

The level of game realized in the current stage internationally is very high and can only be achieved by players with a high performance capacity which is continually growing. As a result, in the contemporary concept about training in handball, instruction of children and juniors is an integral part of the preparation system for professional handball and high-level performance (Gogâltan, 1981). In this context, the quality of education for children and juniors constituted under a mass base of professional handball is a key factor to ensuring a superior performance of handballers at the current level of game requirements and in the view of its evolution.

Kunst-Ghermănescu I and others (1983) consider that the quality of the selection and preparation of future handballers is determined by several factors, among which we might mention:

the conduct of the training process that determines its quality

training of those conducting the work and continue their trening

children and junior selection ensuring a high level of objectivity

providing an educational process which answers all imperatives of science sports trening

knowing individual peculiarities of each child and junior

approaching training components, methodology and dynamic effort applied at different stages and cycles of training

Each player's training stages in actual handball must be spread over a minimum of 8-10 years. This stage is necessary and sufficient as long as there are taken into account both predisposing factors and limiting factors of performance. Selection made around the age of 8-10 years, calls, while learning and strengthening technical elements, general motor skills development. It will establish a general physical training, which will be the support of other components of sports training (Baştiurea, 2005; Mihăilă, 2004). Children at this age, "will pretend play handball", training being realized in proportion with dynamic games, relays, simple exercise structures. Dragnea A. (1996) considers that the initiation of children is the stage which immediately follows the selection and is conducted by a number of methodological rules that ensure the development of children as future performers. Gogâltan V. (1981) presents in his book "Handball - optional course" general objectives for the echelon of children beginners:

Ensuring appropriate selections in strict accordance with perspective requirements of performance handball

Improving general physical preparation with a focus on speed and skill development as well as the development of appropriate indicators for power, strength and jumping for mastering proper technical and tactical exercises

Continuous improvement of general motility content

Proper learning of main base technique of the game, building habits and their application in the bilateral game.

Learning basic tactical rules of technical exercises and appropriate unfolding of the bilateral game according to the game model set for this echelon.

The initiation stage is crucial in the formation and evolution of a handballers future and at the same time decisive for his commitment to performance sport. In the initiation process and the learning of the minimal tactical and technical content, the global method of teaching handball must be used (Rizescu, 2000). Learning, initiation must be done using a large variety of motion and preparatory games, exercising fragments and plays of the game, and even the game itself.

Race elements contribute significantly to the success of the training process. Along with learning basic techniques for both attack and defense, there will be teached basic notions and tactics (individual and collective) to increase the efficiency of these skills. Even at this stage it is recommended to use the opponent in three cases: passive, semi-active, active.

Knowing the trends for children and beginners to concern mainly with the actions of attack that gives them more reward, there must be teached within the same lessons to reverse the striker role with defender, developing equal interest in attack and defense (Hantau, 2002).

Methods

To achieve the goal of the research we used the experimental method, test method and statistical method. The research was conducted at the School Sports Club no. 1 Constanţa, on a group of children (20 girls, aged 8 to 10 years) undergoing selection for training groups of beginners.

Along with the application of somatic, physiological and motor test, for two months a preparation process was held which had the task of following initiation in basic elements of the technique of the game. After this, a series of tests with specific challenges was held. The tests consisted of:

dribbling 20 meters in a straight line

throwing the ball using the momentum of 3 steps

triangle movement (2 courses)

5 precise shots on goal (goal divided into 9 squares)

These challenges were applied to both the initial test and at the final test after 6 months of training. The results were tabulated and statistically interpreted.

Establishing training objectives and tasks, timing of training content in stages and training factors according to specific game models were adopted for a better orientation of the training process (Ghervan, 2003, Budevici, Sufaru, 2004).
A specific game model for initiation in handball was designed for attack and defense play including two phases, tactical and technical means of achievement (Rizescu, 2005).
For attack play:
Phase I: Going from defense to offense
Technical-tactical means of achievement: options running, changing direction, stops, starts, jumping, clearing the ball, passing walking and running in the same plane and depth, driving the ball, throwing the goal of running or jumping, demarcation.
Phase II: Organized attack (with a pivot system)
Technical-tactical means of achievement: layout on the court (respecting positions), passing in successive penetration, passing in horseshoe style while threatening the goal, jump shooting and normal shooting.
For defense play:
Phase I: Retreat in defense
Technical-tactical means of achievement: running, stops, turns, jumps, attacking ball holder.
Phase II: Organized defense (6-0 defense system and "man to man")
Technical-tactical means of achievement: maintaining positions, moving to fundamental position, attacking the ball holder, withdrawing to the semicircular area, marking the opponent.

Consistent with this model a set of goals of general education and training factors was established.
GENERAL OBJECTIVES:
strengthening health
ensuring harmonious development
learning motor skills useful in everyday work and school
getting children used to playing organized
develop ball handling skills
learning basic technical elements of handball: fundamental positioning, movement on court holding, catching, passing, dribbling the ball and shooting
introduction to the game of handball (simplified content)
getting children used to team play
OBJECTIVES CONCERNING TRAINING FACTORS:
Physical preparation:
Objective: To provide age-appropriate general physical development and improvement of basic physical qualities with emphasis on speed and skill.
Tasks: developing short travel speed, reaction speed development, skill development.
Technical preparation:
Objective: initiating children in the basic technique for attack and defense in the game of handball using contests, relays, games of movement and preparatory games.
Offense tasks: ball handling, court movement, fundamental positioning, dribbling the ball, shooting.
Defense tasks: basic positioning, moving on the court while in defense, attacking the opponent in possession of the ball and blocking shooting.
Tactical preparation:
Objective: train the children's basic tactical individual and collective skills, passing the ball, shooting, dribbling and marking.
Offense tasks: acquiring basic individual tactical skills regarding passing and shooting the ball, dribbling and marking, transitioning from defense to offense, positioning in attack and learning to pass rapidly in horseshoe style, creating favorable situations to shoot.
Defense tasks: acquiring basic individual tactical skills regarding fundamental positioning, movement in defense, marking and stealing the ball from the opponent, transitioning from offense to defense and positioning in defense on the semicircle, training to attack a ball carrier and immediate return to the semicircle and defending using the arms for blocking shots.
Theoretical preparation:
Objective: learning the rules of the game: traveling, double dribbling, not touching the ball with the foot, not stepping in the semicircular area, marking the goal, substituting, free-throw, 7-meter throw.
Psychological preparation:
Objective: increasing interest and passion for practicing organized sports activities and, in perspective, performance handball.
Tasks: educating children in the spirit of fair play, respecting your opponents, teammates, coaches, referees, building courage, will, encouraging team work and aiding your teammates, developing a sense of responsibility for the actions of you and your teammates and withholding brutal and selfish instincts.
We developed drills and prepared the planning of training for a period of 10 months, after which we repeated the testing through the use of 4 series.
The drills used during the experiment were as following (Rizescu, 2008):
Movement on court – Mt
Mt 1. Get the last: 3 x 2 min, 45 sec break
Mt 2. Trammel: 4 x 4 min, 30 sec break
Mt 3. Number race: 2 x 5 min, 1 min break
Mt 4. Maze: 4 x 4 min, 45 sec break
Mt 5. Chase the ball carrier: 2 x 5 min, 45 sec break
Mt 6. Relay while running forwards and backwards, with starts, turns, stops, jumps, changes of direction: 6 x 30 meters, 45 sec break

Mt 7. Side, forward, backward movement from a basic defense position: 6 x 30 seconds, 30 second break
Ball school – M
M1. Juggling the ball: 4 x 1 min, 30 sec break
M2. Ball over bridge: 5 x 1 min, 30 sec break
M3. Ball under bridge: 5 x 1 min, 30 sec break
M4. Ball in wave: 5 x 1 min, 30 sec break
M5. Traveling ball (through the side): 5 x 1 min, 30 sec break
M6. Relay while transporting balls (of different sizes) 4 x 30 meters, 45 sec break
Catching and passing the ball – P
P1. Defend the castle: 4 x 2 min, 30 sec break
P2. Ball in a star: 2 x 5 min, 1 min break
P3. Ball at captain: 4 x 3 min, 30 sec break
P4. Nation's ball: 2 x 5 min, 1 min break
P5. Pass the yelled number: 4 x 4 min, 30 sec break
P6. Relays with passes in two: 6 x 30 meters, 45 sec break
P7. Passes between 2 and 3 players on the spot: 5 x 2 min, 1 min break
P8. Passes in triangle with stepping up to ball: 6 x 2 min, 45 sec break
P9. Passes in square: 6 x 2 min, 45 sec break
P10. Passes while running between 2-4 players with and without shooting: 8 x 30 meters, 45 sec break
P11. Simple shuttle: 5 x 2 min, 1 min break
P12. Double shuttle with and without shooting: 5 x 3 min, 45 sec break
P13. At the left and right back player level, passing in attack and retreat behind the string: 4 x 2 min, 45 sec break
P14. At the left, right and center back player level, passing in attack and retreat behind the string: 3 x 3 min, 30 sec break
Shooting – Ap
Ap 1. Shoot at target: 2 x 5 min, 30 sec break
Ap 2. The one who is called shoots: 2 x 5 min, 30 sec break
Ap 3. Ball at tower: 2 x 6 min, 1 min break
Ap 4. Knock down ball: 2 x 6 min, 1 min break
Ap 5. Throw at a distance contest (with tennis or oină balls): 4 x 2 min, 30 sec break
Ap 6. Shots on goal on the spot (hit the posts): 3 x 10 shots
Ap 7. Shots on goal divided into 9 rectangles: 3 x 7 shots
Ap 8. Shots on goal preceded by passes from random attack positions: 3 x 10 shots
Ap 9 . Shots on goal preceded by dribbling: 3 x 10 shots
Ap 10. Shots on goal preceded by horseshoe passes: 3 x 5 shots
Ap 11. Jump shots preceded by passes: 3 x 10 shots
Ap 12. 7-meter shots: 4 x 2 shots
Dribbling – D
D1. Ball on trail: 6 x 30 meters, 45 sec break
D2. Number race with dribbling: 2 x 5 min, 30 sec break
D3. Dribbling on the spot with handy or clumsy arm: 4 x 45 sec, 30 sec break
D4. Dribbling while running in a straight line: 6 x 30 meters, 30 sec break
D5. Simple shuttle with dribbling (20-30 meters): 4 x 2 min, 45 sec break
D6. Dribbling through 6 cones with and without execution: 2 x 8 executions, 45 sec break
D7. Relay with dribbling, groups of 4 players: 6 x 30 meters, 30 sec break
D8. Dribbling while running for 15-20 meters followed by pass or shot: 3 x 7 executions, 45 sec break
Marking and unmarking – MD
MD1. Tag while crouching: 3 x 2 min, 30 sec break
MD2. Catch the shadow: 6 x 30 sec, 30 sec break
MD3. "In mirror" moving: 6 x 30 sec, 30 sec break
MD4. Crabs and shrimp: 6 x 30 sec, 30 sec break
MD5. Who holds the ball longer: 4 x 3 min, 1 min break
MD6. 2-on-2 game, half court: 4 x 2 min, 1 min break
MD7. 3-on-3 game, half court: 4 x 3 min, 1 min break
MD8. Game with "man on man" coverage, whole court: 4 x 3 min, 2 min break
Attacking the ball carrier – Aa
Aa 1. "In mirror" moving in couples: 4 x 40 sec, 20 sec break
Aa 2. From a basic defender position in couples, touch teammate's shoulders: 4 x 45 sec, 30 sec break
Aa 3. Moving with added step on the semicircle, with attacking the centre, left and right backs and touching cones: 6 executions, 30 sec break
Aa 4. In couples, attacker on the 9-meter line, defender at the 6-meter line, the defender attacks the opponent followed by an oblique retreat: 3 x 10 executions and after every execution, the roles are reversed
Aa 5. School game 3-on-3, 4-on-4, 5-on-5 on half court: 3 x 3 min, 1 min break
Collective counter-attack – Ca
Ca 1. Double shuttle in groups of 3-4 players: 4 x 4 min, 45 sec break
Ca 2. Passing while running between 2-4 attackers with 1-3 defenders (passive or semi-active) with or without shooting: 4 x 4 min, 1 min break
Ca 3. Passing while running between 2-4 attackers with 1-3 active defenders in the opponents side of court, with or without shooting: 4 x 4 min, 1 min break
Ca 4. 3-on-3 or 4-on-4 game without throw-off: 4 x 3 min, 2 min break
Collective retreat – Re
Re 1. In couples, one member dribbles the ball, the other retreats on the first member's direction: 6 x 30 meters, 30 sec break

Re 2. Double shuttle, in groups of 3-4 players with retreat: 4 x 3 min, 1 min break
Re 3. One left back and one right back execute 2-3 passes finalize with a shot followed by a retreat to the other semicircle: 15 executions, 45 sec break
Re 4. 3-on-3 or 4-on-4 game without throw-off: 4 x 3 min, 2 min break
Re 5. In groups of 3-4 attackers, pass the ball in successive attack finalized with shot followed by retreat: 4 x 2 min, 1 min break
Pivot attack system – At
At 1. From attacking position with a pivot, pass the ball in successive attack from one wing to the other and reverse: 4 x 2 min, 1 min break
At 2. From attacking position with a pivot, pass the ball in successive attack every two players (wing-centre back-wing-pivot-left back-right back): 4 x 3 min, 1 min break
At 3. From attacking position with a pivot, pass the ball in successive attack with the engagement of the pivot by the backs: 4 x 3 min, 1 min break
At 4. From attacking position with a pivot, pass the ball in successive attack while changing the direction of pass with semi-active defenders: 4 x 3 min, 1 min break
"Man on man" coverage system – Oo
Oo 1. "In mirror" movement, in couples: 4 x 2 min, 45 sec break
Oo 2. "Who holds the ball longer" game with teams of 4-6 players: 3 x 2-4 min, 1 min break
Oo 3. School game on half court, in groups of 4-6 players: 3 x 5 min, 2 min break
Zone coverage "6-0" system – Az
Az 1. Three defenders in the center area that are running after the ball which is being passed between the three backs: 3 x 2 min of work for every defender, 1 min break
Az 2. Four defenders and four attackers (left and right backs and left and right wings), the attackers pass the ball and the defenders, while holding hands, try to always be on the direction of the ball: 3 x 2 min of work as a defender, 1 min break
Az 3. Four defenders and five attackers, the attackers pass the ball, the defenders attack the ball carrier and retreat obliquely in the direction of passing of the ball: 3 x 2 min of work as defender, 1 min break.

The research demonstrates that using planning adequate to objectives and age, practiced through selected and standardized drills, it will significantly improve the level of specific training of children who are part of groups of handball beginners.

Results

The results obtained by the subjects in the two tests are shown in Table 1.

Table 1. Results at specific drills (n = 20 girls)

Variables		M± DS	CV%	"t"	p
20-meter dribble in a straight line (sec)	TI	7,58±0.848	11,187	11,711	<0,0005
	TF	7,04±0,775	11,009		
Movement in triangle 2 courses (sec)	TI	25,85±1,387	5,366	26,163	<0,0005
	TF	19,20±1,105	5,755		
Throwing ball with momentum (m)	TI	14,1±1,997	14,163	10,782	<0,0005
	TF	16,95±2,305	13,599		
5 precision shots on goal	TI	9,35±2,907	31,091	9,2	<0,0005
	TF	11,8±2,397	20,314		

Statistically significant at p<0,0005
M = Average; DS = Standard deviation; CV = Coefficient of variation; "t" = Test student; p = value threshold; n = number of students.

Discussion

The results realized by the subjects were statistically interpreted and the significant aspects of every drill were highlighted:
20-meter dribbling in a straight line - average initial testing was 7.58 sec. At the final testing, performances improved, the average being 7.04 sec. Standard deviation in initial testing was 0.848 and in the final testing 0.775, values which indicate a small dispersion in obtained results. The coefficient of variation in initial testing was 11.187%, while in the final testing it indicated 11.009% showing us the average homogeneity of the group involved in the research. The value of "t" was 11.711, statistically significant at p<0.0005.
Moving in triangle (2 courses) – the average in initial testing was 25.85 sec, while in the final one 19.20 sec. Standard deviation with the obtained results show a small dispersion in them, and the coefficient of variation reveals both in initial and final testing a large

homogeneity of the group. The difference between the average of initial and final testing can be explained by the fact that the drill also implies learning the technique of movement during training. The value of "t" is 26.163, statistically significant at p<0.0005.

Throwing the ball with momentum – the average in initial testing was 14.10 meters and in the final testing 16.95 meters, which registers an increase of final results over initial ones by 2.85 meters. Standard deviation in initial testing had a value of ±2.305, while in final testing is indicated ±2.907, which show us a small dispersion in the results. The value of "t" is significant and falls under the value threshold of p<0.0005.

5 precision shots on goal – initial testing average was 9.35 points and the final testing average was 11.80 points. Due to systematic preparation of individual performances, some girls performances grew very much, while other very little. This fact is revealed by the results which show in initial testing a lack of homogeneity and in the final test an average homogeneity. The value of "t" was 9.20 which is statistically significant at p<0.0005.

A study at the junior I, girls specialized goalkeeper, for a period of four months showed the following results from the TI enthusiastically throwing 32.66 m and 33.66 m, and moving in a triangle (three tracks) from TI 18.96 sec and 18.70 sec to TF (Tugurlan, D. and others, 2011). If the throwing improvement of 20% in both studies, the movement in a triangle improvement is 25% in our study compared with 2% in the study noted.

The obtained values were compared with data from specialty literature (Kunst-Ghermănescu, 1983), observing that they are above the minimal models under the Romanian Handball Federation (1986). Also, they are within the values obtained in other research conducted at this level (Negulescu, 1997; Ghervan, 2003; Rizescu, 2008).

Conclusions

Harmonizing objectives, tasks and technical and tactical methods of training with the requirements of a game model adapted to the peculiarities of children's ages based on a streamlined content of educational training process, contributes to increasing the efficiency of initial selection.

This can lead to an objective selection, resulting in the creation of groups of homogeneous and potentially somatic, motor and superior technical and tactical beginners.

Creating at the beginner's level a plan based on a simplified game model which is implemented by judiciously selected, standardized and verified means appropriate to the proposed objectives and to 8 to 10-year-old children, can lead to rapid progress in training which give certainty of future valuable performances.

Choosing a simplified minimal game model and drills suitable to achieve the set objectives and accessible to 8 to 10-year-old children using many games, relays, contests, structural exercises close to the actual game, we can observe that athletes achieve faster progress which give certainty of future performances.

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RELATIONSHIPS BETWEEN QUICKNESS, AGILITY, AND ACCELERATION PERFORMANCE IN BOY SWIMMERS

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Abstract
The aim of the research. The purposes of this study were to examine relationships between quickness, agility, and acceleration performance in boy swimmers.
Methods of research. Sixteen boys swimmer volunteered to participate in this research. The mean (SD) age was 11,19±1,76 years, height was 1,45±0,12 m, and weight was 39,19±13,35 kg for the 16 boys swimmers. we applied a testing procedure that included measurements of the quickness, acceleration, and agility. Each test was applied three times, with a 3-minute interval, and the best result was recorded. At the beginning of each session, All athletes completed a 10 minute dynamic warm-up consisting of jogging, dynamic stretching and submaximal sprints. Timing of all repetitions was measured by an electronic timing system. Photocells were placed at the start, 5 m (quickness), 10 m (acceleration), and 15 m (acceleration) in order to collect sprint times over the 3 distances. For agility performance, the subjects started on a centerline. The subjects sprinted 4.57 m to the left, then 9.14 m to the right, and finally 4.57 m back to finish as they crossed the centerline.
Main results. A significant positive correlation existed between quickness with accelaration for 5 m, acceleration for 10 m, and agility (r = 0,843, 0,653, 0,776, respectively) (P<0,05), also, there were positive relationship between agility performance with quicness, acceleration for 10 m, and acceleration for 15 m (r = 0,776, 0,733, 0,899, respectively) (P<0,05). There were no relationship between acceleration for 10 m performance and acceleration for 15 m performance (r = 0,425; P>0,05).
In conclusion. Swimmers need to agility, quickness, and acceleration for quickly turns, fathoms, and reactive starts. So, trainers should design the annual training program which has quickness, acceleration, and agility based on swimmer's growth and maturation process.
Key words: Swimming, functional performance, children, sports.

Introduction

Swimming has been recognized as a part of comprehensive physical activity programs for people and is an exercise modality that is highly suitable for health promotion and disease prevention, and is one of the most popular, most practiced and most recommended forms of physical activity. (Hutzler et al. 1998; Tanaka 2009). Swimming is a very demanding sport that requires extreme muscle strength, quickness, and endurance (Balilionis et al. 2012). Energy expenditure in swimming is represented by the sum of the cost of translational motion and maintenance of horizontal motion. The cost of the latter decreases as speed increases (Lavoie and Montpetit1986). Start performance in swimming is a combination of reaction time, vertical and horizontal force. Both the vertical and horizontal forces off the block may be trainable with strength and power training, and support for this is provided by the significant correlation between vertical jumping ability and starting performance observed in swimming (Pearson et al. 1998). The mechanisms behind the link between agility, acceleration and quickness for starting performance are probably multifactorial. For example, heavy-resistance training has been shown to induce hypertrophy and concomitantly increase the size and number of the sarcoplasmic recticulum, thus increasing the rate of release and reuptake of calcium, and improving muscle contraction and relaxation rate all of which would be positive adaptations for increasing power in the quickly swim start (Ørtenblad et al. 2000; Ross and Leveritt 2001). Agility does not have a global definition, but it is often recognized as the ability to change direction and start and stop quickly (Gambetta 19969). Also, agility performance has been defined as the speed in changing direction and control correct body position while quickly changing direction through a series of movements (Sheppard and Young 2006). Agility

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implies greater involvement of deceleration and the ability to reactively couple it with acceleration and deals with the quickly changes in direction and the ability to effectively couple eccentric and concentric actions in ballistic movements (Baechle and Earle 2000). High-speed actions during sport competition can be categorized into actions requiring agility and acceleration. Acceleration is the rate of change in velocity that allows a player to reach maximum velocity in a minimum amount of time (Little and Williams 2005). Accelerating from a stationary position or a moving start requires high force generation capacity to overcome the body's inertia. Quickness is considered both a multidirectional skill that combines explosiveness, reactiveness, and acceleration and agility while incorporating flexibility, strength, and neuromuscular coordination by allowing the athlete to move at a higher rate of speed (Brown and et al. 2000). Scientific research in swimming over the past years has been oriented toward multiple aspects that relate to applied and basic physiology, metabolism, biochemistry, and endocrinology (Lavoie and Montpetit1986; Smith and et al.2002). We can find no published literature on functional performance which is named agilty, quickness and acceleration in swimming. Swimming requires the coordination of whole body. If swimmers want to has very well coordination they have to well trained as agility, quickness, and acceleration performance for start, quickly returns, changes in direction, muscle contraction and relaxation. Agility, acceleration and quicknes are important components of sport performance. Therefore, the purposes of this study were to examine relationships between quickness, agility, and acceleration performance in boy swimmers.

Material and method

Sixteen boys swimmer volunteered to participate in this research. The mean (SD) age was 11,19±1,76 years, height was 1,45±0,12 m, and weight was 39,19±13,35 kg for the 16 boys swimmers. we applied a testing procedure that included measurements of the quickness, acceleration, and agility. Before conducting the investigation, all subjects were informed of the risks of the study and gave informed consent. The study was approved by an ethics board and met the conditions of the Helsinki Declaration. Each test was applied three times, with a 3-minute interval, and the best result was recorded. At the beginning of each session, All athletes completed a 10 minute dynamic warm-up consisting of jogging, dynamic stretching and submaximal sprints. Automated timers, cone, and tape measure for distance were used. Timing of all repetitions was measured by an electronic timing system. The beam was set at a height of 0.5 meters above the start/finish line. Subjects' height is measured with an instrument sensitive to 1 mm. Their body weight is measured with a weigh-bridge sensitive up to 20 g while they are dressed in only shorts (and no shoes). Height variable is in terms of meters, and body weight variable is in terms of kilograms.

Pro agility test. The subjects started on a centerline facing the researcher. The subjects sprinted 4.57 m to the left, then 9.14 m to the right, and finally 4.57 m back to finish as they crossed the centerline. Test was applied three times, with a 3-minute interval, and the best result was recorded for statistical analysis.

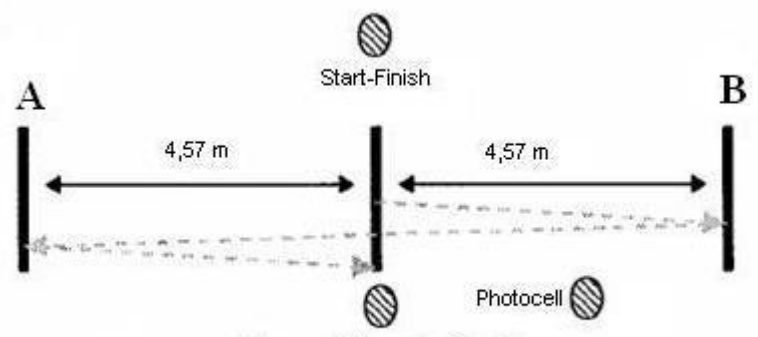

Figure 1. Pro-Agility Test

Quickness and acceleration tests

Photocells were placed at the start, 5 m (quickness), 10 m (acceleration), and 15 m (acceleration) in order to collect sprint times over the 3 distances. The starting position was standardized for all subjects. Athletes started in a 2- point crouched position with the left toe approximately 30 cm back from the starting line and the right toe approximately in line with the heel of the left foot. All subjects wore rubber-soled track shoes.

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Therefore, Quicness was evaluated for 5-m. Acceleration was evaluated using a 10-m and 15-m test. Test was applied three times, with a 3-minute interval, and the best result was recorded for statistical analysis.

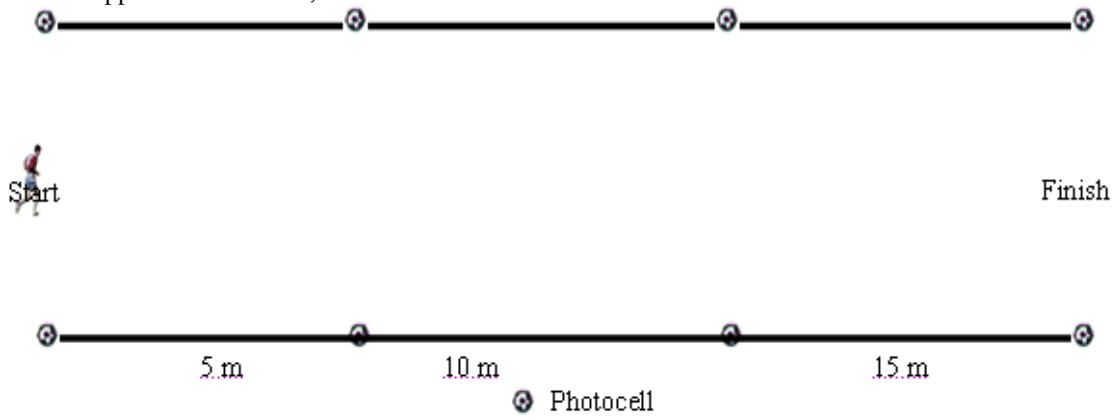

Figure 2. Quickness test for 5 m, acceleration test for 10 m and 15 m.

Statistical Analysis

We summarized the data and evaluated the means and standard deviations. The better of 3 trials was used for analysis for each test. Relationships between quickness, agility, and acceleration was then determined by Pearson correlations. An alpha level of 0.05 was used for all analyses. Statistical analyses were conducted in SPSS 16.0

Results

Table 1. Stature characteristics of the subjects and performance

	N	Mean	Std. Deviation
Age (years)	16	11,19	1,76
High (m)	16	1,45	0,12
Weight (kg)	16	39,19	13,35
Quickness (s)	16	1,34	0,10
Acceleration for 10 m (s)	16	2,24	0,16
Acceleration for 15 m (s)	16	3,02	0,21
Agility (s)	16	5,92	0,45

The mean (SD) age was 11,19±1,76 years, high was 1,45±0,12 m, and weight was 39,19±13,35 for the 16 boys swimmer; the mean (SD) quickness was 1,34±0,10 second, acceleration for 10 m was 2,24±0,16 second, acceleration for 15 m was 3,,02±0,21 second, and agility was 5,92±0,45 second for the for boys swimmer.

Table 2. Bivariate correlations for quickness, acceleration, and, agility variables.

		Quickness	Acceleration for 10 m (s)	Acceleration for 15 m (s)	Agility
Quickness	R		0,843*	0,653*	0,776**
	P		0,000	0,008	0,002
	N		16	16	16
Acceleration for 10 m (s)	R	0,843*		0,425	0,733*
	P	0,000		0,114	0,004
	N	16		16	16
Acceleration for 15 m (s)	R	0,653*	0,425		0,899*
	P	0,008	0,114		0,000
	N	16	16		16
Agility	R	0,776*	0,733*	0,899*	
	P	0,002	0,004	0,000	
	N	16	16	16	

*P<0,05

Performance results are shown in Table 2. A significant positive correlation existed between quickness with accelaration for 5 m, acceleration for 10 m, and agility (r = 0,843, 0,653, 0,776, respectively) (P<0,05), also, there were positive relationship between agility performance with quicness, acceleration for 10 m, and acceleration for 15 m (r = 0,776, 0,733, 0,899, respectively) (P<0,05). There were no relationship between acceleration for 10 m performance and acceleration for 15 m performance (r = 0,425; P>0,05).

Discussion

In the present study, a significant positive correlation existed between quickness with accelaration for 5 m, acceleration for 10 m, and agility (r = 0,843, 0,653, 0,776, respectively) (P<0,05), also, there were positive relationship between agility performance with quicness, acceleration for 10 m, and acceleration for 15 m (r = 0,776, 0,733, 0,899, respectively) (P<0,05). There were no relationship between acceleration for 10 m performance and acceleration for 15 m performance (r = 0,425; P>0,05). Quickness and acceleration was evaluated for 5 m and 10 m (Cronin and Hansen 2005). The acceleration was evaluated using a 10-m test, as previously used by (Wilson et al. 1993). Miyashita et al. (1992) have reported a significant correlation between swim performance to 5 m and leg-extensor power (r = 0.76). West et al. (2011) have reported the strong negative correlation between lower body strength and time to 15 m. Bishop et al. (2009) have reported that, by engaging in explosive-power training sessions in addition to habitual aquatic regimes, swim time to 5.5m was significantly improved, on average by 0.59 seconds, equating to a 15% improvement in performance. Several studies have examined the influence of different physiological parameters in swimming (Holmer and Gulstrand 1980; Town and Vanness 1990; West et al. 2005). But no studies have evaluated the agility, acceleration and quicknes in swimming. Changing direction ability or quick start and stop represent a complex motor ability which is usually called as agility in literature (Bompa 1999; Graham 2000). Although agility represent an important feature for a successful performance in different sports (Trninic et al. 2001; Müler et al. 2000), its physiological and muscular determining are known little (Markovic 2007). Some biomechanical studies show that changes direction can be related with muscle strength and force. Mostly in practicing movements including agility, leg extensor muscle are stretched tight concentrically and following an acceleration phase it includes a fast deceleration phase in which leg extensor muscles are stretched eccentrically (simonsen et al. 2000). To carry out a quick changing direction, it requires attaining to time of contact to quite short place, and so power is required to be produced at a brief period (Young et al. 2002). Consequently, it can be presumed that a high leg extensor strength and force can be related to a successful agility performance (Bompa 1999). Up to now, there has been no evidence of a relation between agility performance and lower extremity strength and force (Markovic 2007).

Conclusions

In conclusion, swimmers need to agility, quickness, and acceleration for quickly turns, fathoms, and reactive starts. So, trainers should design the annual training program which has quickness, acceleration, and agility based on swimmer's growth and maturation process.

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TECHNICAL AND TACTICAL ANALYSIS OF THE NATIONWIDE CHAMPIONSHIP MATCHES IN GRECO-ROMAN AND FREE WRESTLING STYLE

SHEHU ZYLFI[1]

Abstract
Aim.Nationwide Championship Greco-Roman and free wrestling for youngsters was held 27-28 February 2010 Durres, Albania. **The purpose** of this study is to analyze the matches, examine the technical points for all participating teams in both styles. In the Greco-Roman style participated 6 teams, a total of 35 athletes, while the Free style was attended by 12 teams and in total 64 athletes.
Method.The number of matches held in the Greco-Roman style was 42, where with 224 technical point of all participating teams; 22.32% of the points from the 50 kg weight category, 4.02% from 55 kg, 22.32% from 60 kg, 20.54% from 66 kg, 14.29% from 74 kg, 7.14% from 84 kg, 5.8% from 96 kg and 3.57% from 120 kg. 20 matches have ended with touch, 4 matches by technical superiority, 18 derived from the technical points derived from winners and losers.
*Results***.**The number of matches developed in the free style was 67, where 555 technical point of all participating teams were conducted; 9.55% of points from the 50 kg weight category, 11.17% from 55 kg, 12.25% from 60 kg, 23.78% from 66 kg, 26.13% from 74 kg, 7.39% from 84 kg, 3.06% from 96 kg and 6.67% from 120 kg. 31 matches have ended with the touch, 8 matches by technical superiority, and 28 matches with technical points derived from Winners and Losers.
Conclusions.The study made it possible to analyze the performance of participating teams in both styles and gives recommendations for future improvements.
*Key words***:** technical points, greco-roman wrestling, free style wrestling.

Introduction

The scope of the study

Nationwide Championship Greco-Roman and free wrestling for youngsters was held 27-28 February 2010 Durres, Albania. Tactical and technical characteristics are just important in wrestling as other sport disciplines. (F.I.L.A., 1993). Ability is so important and success is formed by combining ability with mentality and force. (Pehlivan, 1984). The purpose of this study is to analyze the matches, examine the technical points for all participating teams in both styles. The study made it possible to analyze the performance of participating teams in both styles and gives recommendations for future improvements.

Method

Kosovo, Albania, Macedonia took part in this championship. In the Greco-Roman style participated 6 teams, a total of 35 athletes, where 42 matches of 8 weight categories were held. In Free style took part 12 teams and in totals 64 athletes where 67 matches were held, of all categories. Study of techniques and tactics is one of the main tasks of the training process in free-style wrestling. (Shakhmuradov, 2006). We have analyzed technical point of every weight and every team in the first period, the second and the third in both styles. We have drawn comparisons of technical results of Greco-roman style and Free Style for each weight and period. Technical points have been acclaimed in different weight categories, for 1 point, 2, 3, 5 points. Besides the physical and anthropometric characteristics, number and ratio of applied techniques in the competitions are important too, there is very little research published about this subject. (Tunnemann, 2001). The results are worked out in Excel, are given in charts and graphics. The matches are closely attended by me and the results are officially given to Wrestling Albanian Federation.

Results

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Table. 1. Technical points achieved by all teams and categories of Greco-Roman Wrestling (FILA, 2007).

Teams	WEIGHTS																								Total
	50 Kg Period			55 Kg Period			60 Kg Period			66 Kg Period			74 Kg Period			84 Kg Period			96 Kg Period			120 Kg Period			
	1st	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	
Partizani	8	11	4	1	6	0	7	2	0	2	0	0	6	5	4	4	1	0	8	3	0	2	1	0	**75**
Beselidhja	0	0	0	1	0	0	1	0	0	8	10	0	0	2	1	3	0	0	1	1	0	2	2	0	**32**
Flamurtari	9	8	1	1	0	0	12	13	4	1	0	0	2	2	1	0	0	0	0	0	0	0	0	0	**54**
Perparimi	0	0	0	0	0	0	6	3	0	4	1	0	0	1	0	7	0	0	0	0	0	0	0	0	**22**
Dinamo	7	1	0	0	0	0	0	0	0	5	11	0	2	4	2	0	0	0	0	0	0	1	0	0	**33**
Shoq.Kamp	1	0	0	0	0	0	2	0	0	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**8**
Total	**25**	**20**	**5**	**3**	**6**	**0**	**28**	**18**	**4**	**24**	**22**	**0**	**10**	**14**	**8**	**15**	**1**	**0**	**9**	**4**	**0**	**5**	**3**	**0**	**224**

In table no. 1 are given the point taken by all participated teams, from 50 kg to 120 kg for all matches, as well as the results of the three periods of matches.

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Table. 2. Technical points for all Free-Style teams and categories. (FILA, 2007).

Teams	WEIGHTS																								Total
	50 Kg			55 Kg			60 Kg			66 Kg			74 Kg			84 Kg			96 Kg			120 Kg			
	Period			Period			Period			Period			Period			Period			Period			Period			
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd	
Kosova A	8	7	1	11	19	7	14	10	5	19	20	0	16	7	3	17	8	0	7	6	0	0	0	0	**185**
Teuta A	0	0	0	8	2	0	12	16	0	10	23	0	18	4	7	0	0	0	0	0	0	10	0	0	**110**
Perparimi	7	3	0	0	0	0	1	1	0	4	0	3	11	7	0	4	7	0	0	0	0	2	1	0	**51**
Kosova B	0	0	0	0	0	0	0	0	0	9	4	0	16	13	1	0	0	0	0	0	0	0	0	0	**43**
Vllaznia	1	3	0	0	0	0	0	0	0	7	4	1	2	0	0	2	0	0	2	2	0	5	0	0	**29**
Kamza	0	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	5	7	0	**17**
Teuta B	2	2	7	0	0	0	0	4	0	1	4	0	0	0	0	0	0	0	0	0	0	4	0	0	**24**
Besa	0	0	0	8	7	0	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	**25**
Liria	6	6	0	0	0	0	0	0	0	7	6	0	7	1	6	0	0	0	0	0	0	0	0	0	**39**
Korabi	0	0	0	0	0	0	0	0	0	0	5	2	0	0	0	0	0	0	0	0	0	0	0	0	**7**
Puka	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0	3	0	0	0	0	0	0	0	0	**9**
Apollonia	0	0	0	0	0	0	0	0	0	3	0	0	7	3	0	0	0	0	0	0	0	3	0	0	**16**
Total	**24**	**21**	**8**	**27**	**28**	**7**	**29**	**34**	**5**	**60**	**66**	**6**	**83**	**45**	**17**	**26**	**15**	**0**	**9**	**8**	**0**	**29**	**8**	**0**	**555**

In table no. 2 are given the points taken by all participated teams, from 50 kg to 120 kg for all matches, as well as the results of the three periods of matches.

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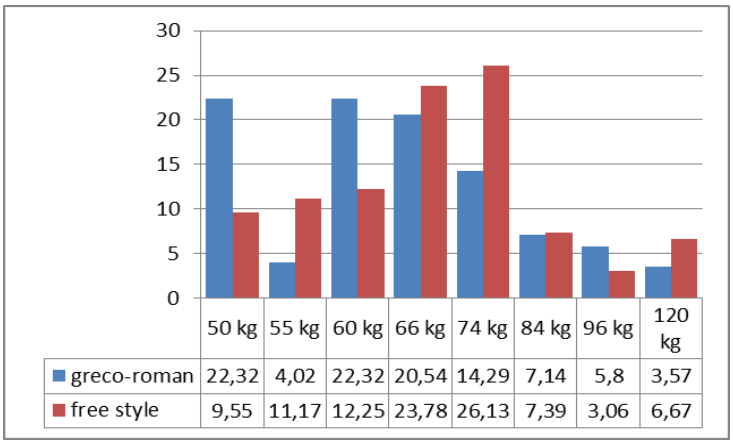
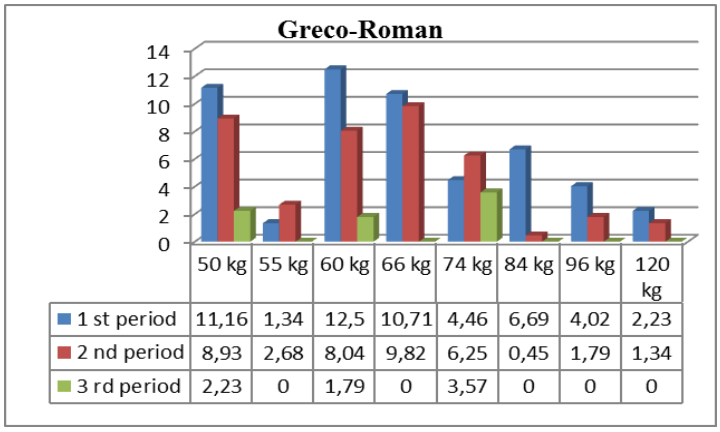


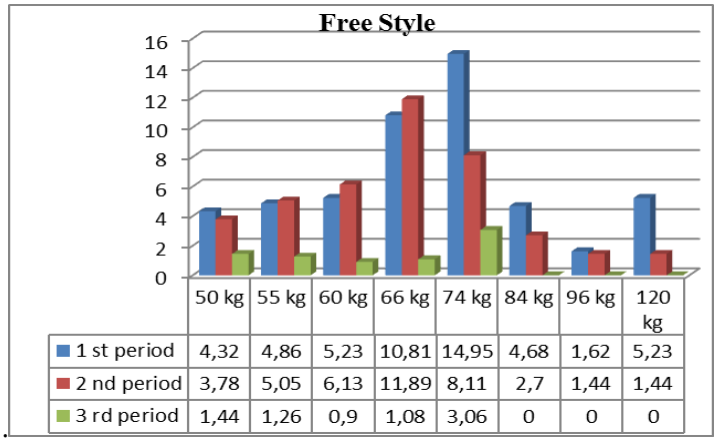
	50 kg	55 kg	60 kg	66 kg	74 kg	84 kg	96 kg	120 kg
greco-roman	22,32	4,02	22,32	20,54	14,29	7,14	5,8	3,57
free style	9,55	11,17	12,25	23,78	26,13	7,39	3,06	6,67

Figure 1. The comparison between technical results of Greco-roman and Free-Style.In the first figure are shown the technical results of Greco- roman and Free-Style. For each weightcategories are given the percentage of total points.



	50 kg	55 kg	60 kg	66 kg	74 kg	84 kg	96 kg	120 kg
1 st period	11,16	1,34	12,5	10,71	4,46	6,69	4,02	2,23
2 nd period	8,93	2,68	8,04	9,82	6,25	0,45	1,79	1,34
3 rd period	2,23	0	1,79	0	3,57	0	0	0

Figure 2. The percentage of technical points for the three periods of Greco-roman style.In the second figure is shown the percentage of technical points, of the three periods matches of each weight categories of Greco-roman style. Technical points of each period are summarized for all participated teams



	50 kg	55 kg	60 kg	66 kg	74 kg	84 kg	96 kg	120 kg
1 st period	4,32	4,86	5,23	10,81	14,95	4,68	1,62	5,23
2 nd period	3,78	5,05	6,13	11,89	8,11	2,7	1,44	1,44
3 rd period	1,44	1,26	0,9	1,08	3,06	0	0	0

Figure 3. Percentage of technical points in the three periods of Free-Style.

In the third figure is given the percentages of technical points reached, for the three periods of matches, for each weight categories of Greco-roman style. Technical points of each period are summarized for all participated teams.

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Weight Categories	Participating		Matches		1 technical points		2 technical points		3 technical points		5 technical points		Non-attendance & Withdrawn from the race		Touch	
	GR	FS	GR	FS	GR	FS	GR	FS	GR	FS	GR	FS	GR	FS	GR	FS
50 Kg	5	8	5	8	20	18	9	10	4	5	0	0	1	0	1	4
55 Kg	4	7	6	7	3	20	3	9	0	8	0	0	0	1	2	3
60 Kg	5	9	5	9	18	27	10	10	4	7	0	0	1	1	2	4
66 Kg	6	10	6	11	11	44	7	32	7	8	0	0	1	0	4	5
74 Kg	5	12	5	12	11	43	6	34	3	11	0	0	0	0	2	7
84 Kg	4	8	6	8	4	19	3	5	2	4	0	0	0	1	3	3
96 Kg	3	4	6	6	6	6	2	4	1	1	0	0	0	0	4	2
120 Kg	3	6	3	6	4	10	3	4	0	6	0	0	0	1	2	3
Total	**35**	**64**	**42**	**67**	**77**	**187**	**43**	**108**	**21**	**50**	**0**	**0**	**3**	**4**	**20**	**31**

Table. 3. Technical points for all weight categories in Greco-roman and Free-Style.

In table no. 3 are given the number of sportsmen, number of matches, technical points 1, 2, 3, 5, of all participated teams in
Greco-roman and Free-Style. It is also shown the number of sportsmen who didn't participate and how many matches ended in touch.

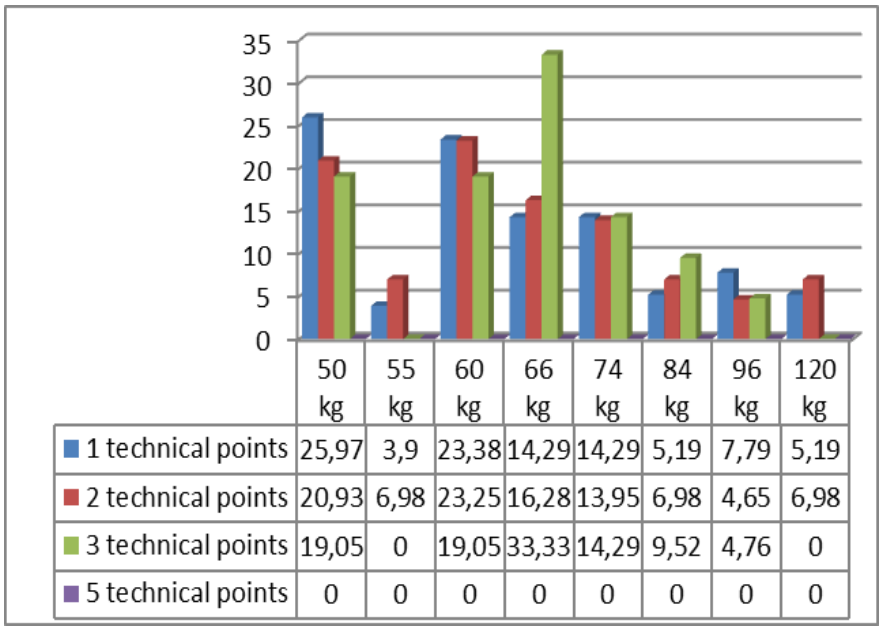

Figure 4. Technical points of all weight categories in Greco-roman style.

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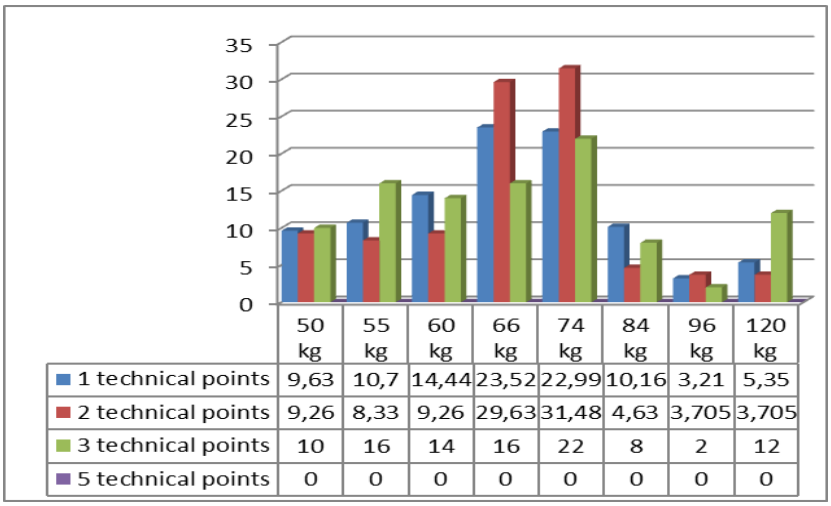

	50 kg	55 kg	60 kg	66 kg	74 kg	84 kg	96 kg	120 kg
1 technical points	9,63	10,7	14,44	23,52	22,99	10,16	3,21	5,35
2 technical points	9,26	8,33	9,26	29,63	31,48	4,63	3,705	3,705
3 technical points	10	16	14	16	22	8	2	12
5 technical points	0	0	0	0	0	0	0	0

Figure 5. Technical points of all weight categories in free-Style.

Discussion

In Greco-Roman wrestling, Partizani team received 3 gold and 4 bronze medals, Beselidhja team received 2 gold, 1 silver and 1 bronze medals, Flamurtari team received 2 gold, 1silver and 2 bronze medals, Perparimi team received 1 gold and 3 bronze and the last team to win medals was Dinamo with 2 silver and 2 bronze. Partizani team was on the top of the rank, followed by Beselidhja and Flamurtari. In Free-Style Kosova A team received 5 gold, 1 silver and 1 bronze medals, Teuta team received 3 gold and 1 bronze medals, Perparimi team received 2 silver and 1 bronze medals, Kosova B team received 2 silver medals, Vllaznia team received 2 silver and 1 bronze medals etc. First place was taken by Kosova A. Teuta was runner-up and the last team in the pod was Perparimi team. In table no. 1 are given the technical points for all three periods and for every Greco-roman wrestling participated team. Partizani team has a total of 75 points (for every weight). Flamurtari team as well as Dinamo team, which is ranked the fifth, both have more points than Beselidhja. The last (Beselidhja) is ranked the second. This means that, in spite of, team ranking, teams have different technical-tactical training. In table no. 2 are given the technical points for all three periods for every Free-Style wrestling team. First place went to Kosova A team with a grand total (for all weights) of 185 points, followed by Teuta team with 110 points, Perparimi with 51 points etc. Liria team with 39 technical points was only the ninth. If we compare this with teams ranked fifth, sixth, seventh and eighth, has achieved more points. Probably because Liria team from Macedonia has a higher technical rate because has achieved more 1, 2, 3 point. The worst technical rate goes to Korabi team with only 7 technical points. That's the number of points won by a single player of other teams for only one period. In figure no. 1, in Greco-roman style are spread between teams, for every weight category, a total of 224 technical points. 50 and 60 kg category have achieved 22.32 %, 66 kg with 20.54 %, followed by 74 kg with 14.29 %, which are categories with highest percentage. Meanwhile categories 84 kg with 7.14 %, 96 kg with 5.8 %, 55 kg with 4.02 % and 120 with 3.57 %. On the other hand, in free-style are spread out 555 technical points between teams and categories. Weights 74 kg with 26.13 %, 66 kg with 23.78 %, 60 kg with 12.25 %, 55 kg with 11.17 %, 50 kg with 9.55 %, 84 kg with 7.39 %, 96 kg with 3.06 % and 120 kg with 6.67 %. Differences in technical points in these two styles are obvious. In 50 kg, 60 kg, 96 kg categories Greco-Roman style made more technical points than the Free-Style. Differences are pretty obvious. Whereas 55 kg, 66 kg, 74 kg, 84 kg, 120 kg categories in free-style made more technical points than in Greco-roman style. In figure no. 2, Greco-Roman style, first period the highest result was achieved by 60 kg category with 12.5 %, 59 kg category with 11.16 % followed by 66 kg category with 10.71 %. On the other hand the worst result was achieved by 55 kg category with 1.34 % and 120 kg category with 2.23 % and 96 kg with 4.02 %. In the second period 66 kg category had the best result with 9.82 % followed by 50 kg with 8.93 % and 60 kg with 8.04 %. 84 kg, 120 kg, 96 kg category had the worst result with 0.45 %, 1.34 %, 1.79 % respectively. In the third period highest results are achieved by these categories: 74 kg, 50 kg and 60 kg with respectively 3.57 %, 2.23 % and 1.79 %. Other categories haven't made a single point in this period because are eliminated either in the first or second period. From 42 matches overall, 27 of them have ended in the first or second period. Others have ended in the third period. In figure no. 3, results show clearly that 74 kg category had achieved the highest result in the first period with 14.95 %, followed by 66 kg with 10.81 k%, whereas the worst result belongs to 96 kg and 50 kg categories

with 1.62 % and 4.32 %. In the second period, 66 kg, 74 kg category had the best result with 11.89 % and 8.11 % whereas the worst belongs to 96 and 120 kg categories with 1.44 % as well as 84 kg with 2.87 %. In the third period there are only a few points realized. 74 kg category had the best result with 3.06 % whereas 60 kg with 0.9 %, the worst. From 67 matches all in all, four athletes didn't show up. 24 matches ended in the first two periods. Others were full played, with 3 periods. In table no. 3, are represented technical results for both wrestling styles. In the Greco-Roman style for all weight categories 1 technical points is 55 %, 2 technical points is 30 %, 3 technical points is 15 % and 5 technical points is 0 %. In the free-style 1technical points is 54.20 %, 2 technical points is 31.3 %, 3 technical points is 14.5 % and 5 technical points is also 0 %. In table no. 4 are represented in percentage techniques of all weights from all teams, in Greco-Roman style, where light weights as well as medium weight had achieved the best result in 1 technical points, 2 technical points and 3 technical points ,expect 50 kg category, whereas heavy weights had bad results in these techniques. In figure no. 5 are represented in percentage techniques of all weights from all teams, in the Free-Style, where middle weights have achieved the best result in 1 technical points, 2 technical points and 3 technical points, whereas light and heavy weights appear to be not so good. In the Greco-roman style 20 out of 42 matches have ended with touch. In the free-style 31 out of 67 ended with touch-down. In most sports, going totally defensive can give a result no better than a tie, but with the current wrestling rules, it is possible to gain a win. (.Curby, Dziedzic, Fraser, 2009). Most of the matches ended up since the first or second period. This means that athletes with higher technical points than opponents, in a good advantage to win the match, in a moment have ended it with a touch. Most of the touch happened as a result of bad technical grab. The competitive separation between winners and losers is dependant, in a large degree on the winning of the ball draw. This is not a satisfactory situation for a fairy competition. (Curby, Dziedzic, Fraser, 2009).

Conclusion

In Greco-Roman wrestling, in the first, second and third period light and medium weights have achieved more technical points that heavy and 50 kg category. In the third period heavy weights have made no points. Light weights have achieved more 1 technical points, 2 technical points, 3 technical points than middle or heavy weights. In the free-style, in the first and second period, middle weights have achieved more technical points than light and heavy weights. In the third period, light and middle weights have achieved some technical points whereas heavy weights none. Middle weights have achieved more techniques than light and heavy weights. In both wrestling styles, we have a high percentage of 1 technical points. No 5 technical points was made possible. Coaches should make part of their schedules more Dummy Throw. Most of the matches ended up with a touch. In this direction a hard work must be done in Flexibility and special mobility.

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PHYSICAL PROFILE OF PARTIZANI TEAM IN GREEK-ROMAN WRESTLING FOR YOUNGSTERS

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Abstract
Purpose. The goal of this research is to understand and analyze the physical skills of the Greco-Roman wrestling team, applying a systematic scientific procedure. Through various physical tests that we will apply, we aim at arriving to results that will reflect the current state of the wrestlers and the new opportunities for all weight categories. These results will help us to compare the youngsters' results with those of the professionals and FILA's standards.
*Methods***.** The youngsters are of age 18-21 years, were various physical tests will be used and all possible results for each category will be recorded. For the realization of this study we consult the various literature and studies by international and national authors. The data obtained from the tests were processed in Excel and the various tables and graphics were constructed.
Results. After processing the data of the tests for the following components: aerobic power, speed and power, speed endurance, speed strength, strength endurance, dynamic strength endurance, flexibility and special mobility; we notice that the wrestlers of light and medium weight are faster than those of heavy weights especially in such tests where body weight is the primary determinant e.g. rope climbing or gymnastic iron. Also, the wrestlers of light weights quickly perform actions typical of the sport of wrestling, such as Dummy Throws. This is explained by their relative strength compared to those of heavy weights. Interesting are the results of the sprint, which is predominates by those weighting 84 kg. Perhaps this is related to the great muscular mass those wrestlers of this weight have, yet it remains to be confirmed in future studies.
Conclusions. The results of this study can serve as a guide for all wrestling coaches, who can use these results for a more harmonious preparation of their athletes. Having said that, the study has applicable implication and serves to increase the quality of sports in this discipline.
Key words: Greek-Roman wrestling, aerobic power, speed strength, flexibility, dynamic strength endurance.

Introduction

Aim and objectives

Wrestling is a sport that requires force and power production from both the upper and lower extremities muscles as well as isometric and eccentric force for the various wrestling techniques. (Fatouros, Destouni, Margonis, Jamourtas, Vrettou, Kouretas, Mastorakos, Mitrakou, Taxildaris, Kanavakis, Papassotiriou, 2006), (Diezemann, 2005). Accomplishments in wrestling can be by improvements of some criteria relevant to high performance, such as physical and physiological power, technical ability, mentality tactics, experience and motivation. (Niebel, Niebel, 1982)

The aim of this study is to explore, to try to understand and to study the physical capacities of the team which exercise the Greco – Roman wrestling which is the subject of our research applying sistematic scientific procedures. The origin of this scientific research comes from the great performane of Partizani team in the national and international activities, and which from year to year has experienced a visible growth in the contex of results and physical performance.

Via the different physical tests which are gong to be applied, we will reach to results that will reflect the actual state of the young wrestlers of the all weight categories. These results will be helpful in the comparison process of them to those of Elite and FILA standards, as well as to give solution to a problem raised even thought the solution of this problem isn't our main aim.

The final results and the conclusions which will came out from this research may suggest the possible solution drafting this way a training plan which will be used to improve the wrestlers capacities according to the required standards. The aim of this research in itself is to understand better the phenomena, passing throught different sistematic steps and following some well defined procedures aiming that the results obtained in the end of this process are as less as

possible subject influenced. Respecting rigorously the scientific method during the research, aims to minimize as much as possible this subjecitivity in order that the final research result is as objective as it may be possible. As a conclusion, the study will give valuable recommendations for the future of the team, as well as for other teams in general in the future.

Study methodology

We have choosen as a study case "Partizani" team of the Greco – Roman wrestling for youngsters, which for many times has won the champion title. There are taken into consideration all weight categories from 50 kg to 120 kg, in a total of 8 weights. Some from the subjects which were taken as a study case, have been announced national champions for 2012.They were tested 10 days after the ending of the national championship and as a reference for the weights category it was taken the weight of the sportive activity. The atmospheric conditions during the test have been very favorable. The temperature have varied from 20^0 -22^0 C.

Study methods used:

1.This is a study which bears a natyral character because it has a small financial value (this kind of tests don't need big financial support) and this is the main reason why we chose this method. This kind of test method it is widely used from the Russian researchers. The technology and laboratories usage to test this method, it was firstly used from the American and German researchers, and this is still not present in our country even for the fact that it is very expensive.

2.The subjects are of the age 18-21. There are been used different physical tests and there are given results for every wrestler according to the weight categories.

3.There are used the instruments and equipments such as: cronometer, meter, calculator, whistle, dummy with different weight, rope, astound, flag etc. They are taken from the Wrestling and Atletics Federation and they are standartized and certificated. All tests are standartized according to FILA-s studies. For this research realization, it was used literature and different studies from our country and foreign authors. The data obtained from the tests were elaborated in Excel and presented in different tables and graphics.

4.There have been realized various activities and the time for tests implementation was dividend into 3 days (tests are implemented every day in the morning and in the afternoon). Running and Standing Long Jump are realized at "Qemal Stafa" National Stadium, where it is found a running track according to the international atletics standards and which it is certified from the international sports institutions. The wrestling tests were realized in the Olympic carpet which is certified from FILA. The pull-ups tests and rope climbing were implemented in the gym of the artistic gymnastic (with olympic paralels certified from the National and International Gymnastic Federation). While, the weight lifting test in horizontal bench was performed in the weightlifting gym with Olympic astound. They were tested for the following physical elements: *Speed endurance:* Dummy Throw (Curby, 2005). *Aerobic Power***:** Running 3 x 750 meter (Curby, 2005). *Speed & Power:* 60 meter sprint, Standing Long Jump (meters) (D.G. Curby, 2005), (D. Curby, 2010). *Speed strength:* Weight lifting test in horizontal bench 8 times (implementation time). Pull-ups 10 times (implementation time) (Curby, 2005). *Strength endurance*: Pull-ups (no limited time) (D. Curby, 2010). *Dynamic strength endurance:* 5 meter height rope climbing (5 minutes) (Curby, 2005).*Flexibility and special mobility*: Flips from a wrestling bridge (Curby, 2005). A change of position from bridge face down to bridge face up by moving feet (6 times to the left, 6 times to the right) (s). (Curby, 2010)

The main reason why I decided to use the above mentioned components is because they are the basic elements for the physical preparation and they play key a role in reaching high results. *Time of tests implementation lasted three days:*

In the first day it was tested: The 60 meter running it was developed divided into 4 batteries (2 wrestlers in each). Standing Long Jump was realized in the running track (each from the athletes were tested twice, and the best time was recorded as the final result).The 3 x 750 m running was realized into two batteries (every battery with a content of 4 wrestlers), between every period it was made a one minute break.

In the second day it was tested: Dummy Throw which was realized 3 x 30 sec, with 30 sec break between every session. For every session it was recorded the throw number for each of the weight categories. Flips from a wrestling bridge 1 x 30 sec where for every weight it was recorded the passing number. 360^0 rotations from wrestling bridge, it was measured the time of 6 rotations into one direction and 6 into the other direction (there were joined both results and it came out a time). The weight lifting test in horizontal bench, for each category it was calculated for the astound weight to be 75% of the corporal wrestler weight. *In the third day it was tested:* Pull-ups which were realized in two phases: with no limited time and with limited time in the pull-ups implementation (10 pull-ups for how many seconds of implementation). Rope climbing which was realized with a 5 meter long rope, time of climbing 5 min, results of how many times can its' climbing can get realized within this time for each of the weight categories. Climbing rules used: they couldn't use their legs, horizontal leg position, and no contact with the ground during 5 minutes etc.

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Study results

Table nr.1: The Dummy throw standard 3 x 30 sec according to FILA-s. (D.G. Curby, 2005).

Nr.	The throw standard based on FILA	The Dummy throw 3 x 30"			Max	Min	Ave	Ideal max	Ideal Ave	Throw Test Index
		30" I	30" II	30" III						
1.	The ideal throw Nr.	16.0	13.0	10.0	16	13	13.00	16	13	100 %

*In table nr.*1 it is reflected Dummy throw with amplitude (suplex), 3 x 30 seconds with 30 sec break between every session. This method it was used from the American scientist David Curby in his study titled "The physical test of the Greco – Roman Wrestlers". In the table it is presented the throws result which should be realized for every 30 sec session. The maximal, minimal and average throws as well as the throw test index which is 100% based on the standard results of FILA. For every weight categories we will come out with our results and we will make the respective comparisons based on their index.

Table nr.2: The Dummy throw 3 x 30 sec. (D.G. Curby, 2005).

Nr.	Weight category	Dummy Weight	The Dummy throw 3 x 30			Max	Min	Ave	Ideal Max	Ideal Ave	Throw Test Index
			1st 30 sec	2nd 30 Sec	3rd 30 sec						
1.	50 Kg	50 Kg	13	10	9	13	9	11	16	13	77.72 %
2.	55 Kg	55 Kg	12	10	8	12	8	10	16	13	70.67 %
3.	60 Kg	65 Kg	12	9	8	12	8	10	16	13	70.67 %
4.	66 Kg	65 Kg	13	11	8	13	8	11	16	13	75.02 %
5.	74 Kg	65 Kg	11	10	7	11	7	9	16	13	63.63 %
6.	84 Kg	85 Kg	10	10	8	10	8	9	16	13	63.51 %
7.	96 Kg	85 Kg	10	8	9	10	9	9	16	13	66.20 %
8.	120 Kg	95 Kg	10	7	6	10	6	8	16	13	56.59 %

In table nr.2 we have presented the test results of the Dummy throw 3 x 30 sec with 30 sec of break for every session. There were tested 8 categories, from 50 kg to 120 kg. The Dummy weight used is different for all wrestlers' weight categories. The weight categories 50, 55, 60 and 66 kg have reached the highest result compared to those from 66 kg to 120 kg which fall in regressive manner.

For the extraction of the index of the Dummy throw it was used this formula:

((((Lowest # Throws/Ideal High) * 3.5) + ((Highest # Throws/Ideal High)*4.5) + ((Average # Throws/Ideal Average)*2))/10)*100. (D.G. Curby, 2005)

The highest result is that of 50 kg, while the lowest one is that of 120 kg.

Figure nr.1. Comparison of results between Partizani team and the standard of FILA for Dummy throw.

In figure nr.1 we have presented the Dummy throw results for all weight categories, in order for us to compare them later with those of FILA (for all three throw sessions). If we compare the results of our team for the first throw session with those of FILA, it is visibly noticed that the weight categories 50, 55, 60 and 66 kg are far from the standard of 16 throws. They have reached nearly the average realizing 12-13 throws (13 throws for the second session according to FILA). While the other weights 74, 84, 96 and 120 kg are far away from this standard which for the first session have reached the same number of throws as it is realized at FILA in the third session. So, they have not reached acceptable results, because they are not close even to the second throws session of FILA standard which marks the number 13.

Table nr.3: Running 3 x 750 m. (D.G. Curby, 2005).

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Nr.	Weight category	1ST Period	2ND Period	3RD Period	Maximal	Minimal	Average
1.	50 Kg	2.40	2.49	3.01	3.01	2.40	2.50
2.	55 Kg	2.46	2.56	3.05	3.05	2.46	2.56
3.	60 Kg	2.50	3.01	3.12	3.12	2.50	3.01
4.	66 Kg	2.52	3.00	3.12	3.12	2.52	3.02
5.	74 Kg	2.54	3.13	3.22	3.22	2.54	3.10
6.	84 Kg	3.09	3.19	3.30	3.30	3.09	3.26
7.	96 Kg	3.15	3.30	3.41	3.41	3.15	3.29
8.	120 Kg	3.55	4.11	4.24	4.24	3.55	4.10

At table nr.3 for all weight categories it is presented: running results 3 x 750 m,

implementation time for all three periods, results average, maximal and minimal for all periods.

Figure nr.*2.* Running 3 x 750 m

In the figure nr. 2 it is presented the running test which measures the aerobic power for all weight categories. As you may see from the results, the weight 50 kg obtains the best results for all three periods. Whereas, the poorest results belong to the weight category 120 kg. The weights 50 and 55 kg have a high aerobic power, directly followed by the weight 60 and 66 kg with a slight decrease. Whereas, the weight category 74, 84, 96, 120 have a high aerobic power. This is reflected this even with the long time needed for the running realization for all three periods.

Table nr.4: Tests

Nr.	VARIABLES	WEIGHT CATEGORY							
		50 KG	**55 KG**	**60 KG**	**66 KG**	**74 KG**	**84 KG**	**96 KG**	**120 KG**
1	Age	20.31	20.11	19.03	18.53	19.35	20.55	18.45	18.02
2	60 meter sprint	7.70	7.93	7.99	7.87	7.88	7.34	7.45	7.85
3	Standing Long Jump	215.50	220.40	226.50	231.10	243.25	250.10	255.10	258.50
4	Rope climbing 5 m, time 5 minutes.	5 times	5.5 times	6 times	6.5 times	7 times	7 times	6 times	5.5 times
5	Pull-ups (unlimited time)	26 times	28 times	29 times	31 times	30 times	25 times	21 times	19 times
6	Pull-ups (10 pull-ups)	16.01 sec	17.22 sec	17.88 sec	18.29 sec	18.77 sec	19.87 sec	21.99 sec	23.86 sec
7	Speed strength, weight lifting test in horizontal bench, 8 lifting /time/sec.	9.01 sec	8.46 sec	8.12 sec	8.01 sec	7.40 sec	7.23 sec	7.72 sec	8.91 sec
8	Flips from a wrestling bridge (30 sec)	13.5 times	13 times	12.5 times	13 times	11 times	10.5 times	9 times	8 times

9	A change of position from bridge face down to bridge face up by moving feet (6 times to the left, 6 times to the right) (s)	26.32 sec	26.24 sec	25.06 sec	27.46 sec	28.11 sec	30.50 sec	33.67 sec	34.02 sec

At the table nr. 4 are presented several tests: 60 m sprint, standing Long Jump, 5 meter rope climbing, pull-ups with no limited time, pull-ups (10 times) realization time, weight lifting test in horizontal bench (75 % of your weight class weight for 8 reps) realization time, flips from a wrestling bridge (30 sec, how many passing are realized for every weight), 360^0 rotations to the left and to the right (from wrestling bridge) realization time.

Discussion

In speed endurance test which was measured through the Dummy throws, from the results it is visibly seen that in the first period we have acceptable results for all weight categories.

But, in comparison to the FILA standards presented in table nr. 1, they are low. From 50 kg to 66 kg the first period results are nearly the same to those of the second period. Whereas, from weight 74 to 120 kg for the first period we have very low results, which if we compare to those of FILA, are the same as the third period. In the second period, for all weight categories we have a great decrease of the Dummy throws results. It is seen also a greater decrease in the third period. If we compare the Dummy throws index for all weights, to the table nr. 1 index according to the FILA standard, then it is visibly noticed that from 100% of the index, based on all weight categories we have the same index for all three periods where; weight 50 kg with 77.72 %, 55 kg 70.67 %, 60 kg 70.67 % and 66 kg 75.02 %. These categories have endurance of average speed whereas weights 74 kg with 63.63 %, 84 kg 63.51 %, 96 kg 66.20% and 120 kg 56.59% have low speed endurance, under average. From the results, it is visibly noticed that with the corporal weight increasing, the speed endurance Dummy throws it is greatly decreased. This may come as a result of the Dummy weight increase. In the aerobic power measurement test which is realized 3 x 750 m with a minute break, at the table nr.3, it is easily noticed that the light weights have better and sustainable results. On the other hand, in the average and heavy weights we have a progressive decrease of aerobic power. This is perhaps related with the heavy weight and great muscular mass of them, which remains to be verified in the following studies. In the 60 m sprint running (table nr. 4), we have nearly the same results where it is noticeably seen the weights 84 and 96 kg, directly followed by 50 kg. While, in the Standing Long Jump (table nr. 4), for the light and average weights, we have average results which increase with the weight increase and where we can see a dominance of the weight 120 kg with 258.50 cm and 96 kg with 255.10 cm, from 50 kg to 120 kg the Standing Long Jump results are increased in a progressive way. This is explained with the fact that as much as the weight is increased, as much we see an increase of the results. A factor of this may be the subject height, as well as their muscular mass which increase from the lightest weight to the heaviest ones. In the dynamic strength endurance, which was tested in the rope climbing, resulted that the weight 74 kg and 84 kg reached the highest result compared to other weights. They climbed for 7 times, in a 5 m long rope for 5 minutes without interruption. The lowest result is obtained from the weights 50, 55 and 120 kg mean while the average one is for other weights. These results show a high performance of the dynamic strength endurance in general for Partizani team. The strength endurance was measured via pull-ups with no limited time, where the average and the light weights reached the highest number of pull-ups. On the other hand, the heavy weights have a noticeable decrease compared to the other weights. In general, these results are according to the standards. In the pull-ups, 10 pull-ups, for which it was, measure the time the light weights reached the highest results in comparison to the average and heavy weights. With the weight increase, it is also increased the exercise implementation time. In the weight lifting test in horizontal bench, the best time was realized from the weight 96 kg with time 7.72 sec followed from 84 kg with 7.23. The best time for the speed strength implementation was reached from the light and average weights as well as that of 120 kg. The flexibility it is measured through the subjects test for flips from a wrestling bridge with limited time of 30 sec, where the weight 50 kg reached the highest result with 13.5 passing, 55 and 65 kg with 13.60 kg with 12.5. Meanwhile, from 74 to 120 kg we have a great decrease of the result starting from 11 with 10.5, 9 and 8. Mobility from a wrestling bridge, we have results which vary in progressive way starting from the weight 50 to 120 kg. The best result was reached from the weight 66 kg with 25.06 sec and the best time was reached from the weight 120 kg. The results are gathered for rotations, 6 in one direction and 6 to the other. Wrestling is a complex sport, where the exerciser should be prepared in all physical elements

such as, strength, cardiovascular endurance, flexibility. Our study introduces a detailed identification of all these skills. Here are some muscular strength and endurance factors. Testing such as this can detect athlete weaknesses, set standards, and provide motivation (Curby, 2009). It is noticed that the light and average weight wrestlers are faster than those of heavy weights in such tests where the corporal weight is a main definer, such as rope climbing or gymnastic iron. It is also seen that the light weight wrestlers perform faster typical exercises of the wrestling sport such as dummy throw. This is explained with their relative bigger strength compared to the wrestlers of the heavy weights. The sprint results are very interesting, where we can notice a predominance of the weight 84 kg. Perhaps, this is connected to the greater muscular mass of the subjects of this weight, but this remains to be verified in the future studies. At the same time, muscular endurance is necessary for performing techniques and also, for attack and defense-related fatigue tolerance which must be considered in the planning of the training program. (Mirzaei, Arazi, Curby, Barbas, Ghahramani Moghaddam, Hosseini, 2012).

Conclusions

The average and heavy weights should work more in the context of improving the speed endurance, strength endurance, aerobic power, speed strength (pull-ups) and in the special flexibility mobility. They reached great results in the dynamic strength endurance as well as standing long jump but this is not enough, because the majority of the main elements which play a key role in a wrestler are not in satisfying levels. In general, the average weights have a under average level. On the other hand, the light weights have an over average level of preparation compared this to other weights. They are more prominent in dummy throw, pull-ups, mobility etc. It is necessary that in the future are drafted programs which affect in the improvement of the results, especially for average and heavy weights. While for the other weights we need to concentrate in some preparation elements where we see the worst results. Some studies have reported that an increased training volume does not produce any performance change in Olympic lifts during short-or long-term training periods. (AC. Fry, WJ). Kraemer, Stone, Warren, Fleck, Kearney, Gordon, 1994), (Hakkinen, PV. Komi, Alen, Kauhanen, 1987). It seems that when a given optimal volume is reached, a further increase in training volume does not produce more gains and can even lead to reduced performance. (Gonzalez-Badillo, . Gorostiaga, Arellano,Izquierdo, 2005).

The results of this study may serve as a guide for all wrestling coaches, who have the possibility to use these data for a better and more harmonic preparation of their athletes. Seen from this point of view, the study has applicative values and serves greatly for the sportive quality increase in this sport.

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EVALUATION OF AGILITY WITH REGARD TO DIFFERENT START POSITIONS

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Abstract
*The aim of the research***.** The purposes of this study were to examine agility with regard to different start positions.
*Methods of research***.** A total of 21 girls and boys swimmers were examined. The mean (SD) age was 11,57±1,41 years, height was 1,46±0,10 m, and weight was 39,57±9,82 kg for the 9 girls swimmers; the mean (SD) age was 11,67±1,37 years, height was 1,47±0,11 m, and weight was 41,28±12,56 kg for the 12 boys swimmers. Agility evaluated with pro-agility test in three different start positions (the left side of the starting line**,** the right side of the starting line, and the backward of the starting line). Each test was applied three times, with a 3-minute interval, and the best result was recorded.
*Main results***.** We did not find any statistical differences with regard to first ten-meter start, second ten-meter start, and agility test values of girls swimmers in various start positions ($p>0.05$). Also, we did not find any statistical differences with regard to first ten-meter start, second ten-meter start, and agility test values of boys swimmers in various start positions ($p>0.05$).
*In conclusion***.** It was concluded that remarkable change did not occur from examining agility performances of different start positions. The agility in the girls and boys did not have a significant effect in different start positions.
Key words: Swimming, agility, children, sports

Introduction

To exhibit optimal Performance, the agility is an important ability in many sports. İt is indicate that the agility is a specific motor skill at current literatures. The agility Performance is can be increased through a well planned exercise program. Additionally, it is believed that transfer between speed and agility is limited (Holmberg 2009). Speed, agility, and power are important components of sport performance. On the basis of a periodized model of training, use of speed technique, agility, and low-level plyometrics is beneficial when they are performed in the preparation phase of a yearly training program (Robinson 2004). Today, there are a variety of players who enjoy this great sport, including seniors. Speed, quickness, and agility decline with age, and this skills are very important for the successful athletes. Many athletes are trainedspecifically by coaches for speed, quickness, and agility. Many advantages are gained from this type of training, including improved speed and quickness, less wasted movement and actions, and a greater improvement in agility (Miller et al 2001). The agility is an indispensable component of performance for succes in many sports, such as football, tennis, basketball, soccer. athletic performance coaches are liable out of the improvement of agility. The agility frequently includes sprints in a flat line and rapid deliberate changes of direction (Holmberg 2009). Many sports performed motions which require high-speed of the whole body on a court or on a field. This movements contain a response against the motion of a ball under a reaction of opposition players or teammates. This motor features may be described as agility. İt is between times categorized together with terms such as speed and quickness. The development of this skill is the responsibility of the strength and fitness coach. İt is difficult that the agility is developed when it is compared with other companents of performance (Young ve Farrow 2006). The agility has been an important component of physical exercise programs but has not been well researched scientifically. This inadequacy of information seems odd, considered agility training were the topic of 2 separate symposia presented at an NSCA National Conference However, these symposia, like so many articles on the topic presented only training methods. So far, researchers have notfully explored why various training protocols work or why one is better than another (Craig 2004). Greater agility ability could be particularly benicifical for swimmers to allow efficient transfer of force between the trunk and the upper and lower extremities to propel the body and returns

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through the water in pool. Therefore, the purposes of this study were to examine agility with regard to different start positions.

Material and method

A total of 21 girls and boys swimmers were examined. The mean (SD) age was 11,57±1,41 years, height was 1,46±0,10 m, and weight was 39,57±9,82 kg for the 9 girls swimmers; the mean (SD) age was 11,67±1,37 years, height was 1,47±0,11 m, and weight was 41,28±12,56 kg for the 12 boys swimmers. Before conducting the investigation, all subjects were informed of the risks of the study and gave informed consent. The study was approved by an ethics board and met the conditions of the Helsinki Declaration. Each test was applied three times, with a 3-minute interval, and the best result was recorded. At the beginning of each session, subjects completed a 10 minute dynamic warm-up consisting of jogging and dynamic stretching. Automated timers, cone, and tape measure for distance were used. Timing of all repetitions was measured by an electronic timing system. The beam was set at a height of 0.5 meters above the start/finish line. Subjects' height is measured with an instrument sensitive to 1 mm. Their body weight is measured with a weigh-bridge sensitive up to 20 g while they are dressed in only shorts (and no shoes). Height variable is in terms of meters, and body weight variable is in terms of kilograms.

Pro-agility test

The left side of the starting line: The subjects started on a centerline facing the researcher. The subjects sprinted 4.57 m to the left, then 9.14 m to the right, and finally 4.57 m back to finish as they crossed the centerline. Test was applied three times, with a 3-minute interval, and the best result was recorded for statistical analysis.

The right side of the starting line: The subjects started on a centerline facing the researcher. The subjects sprinted 4.57 m to the right, then 9.14 m to the left, and finally 4.57 m back to finish as they crossed the centerline. Test was applied three times, with a 3-minute interval, and the best result was recorded for statistical analysis.

The backward of the starting line: The subjects started on a centerline. The subjects sprinted 4.57 m to the left, then 9.14 m to the right, and finally 4.57 m back to finish as they crossed the centerline. Test was applied three times, with a 3-minute interval, and the best result was recorded for statistical analysis.

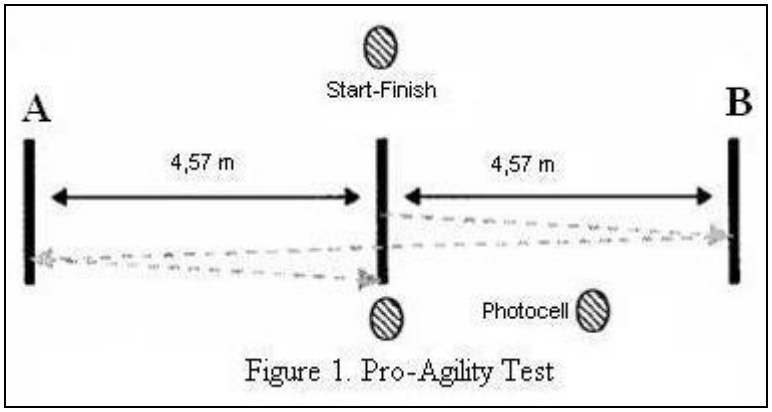

Figure 1. Pro-Agility Test

Statistical Analysis

SPSS 16.0 statistical program was used for evaluation and calculation of the data.We summarized the data and evaluated the means and standard deviations. To explain differences between measurements, one-way analysis of variance was used according to the results of the test of normality. The significance level was taken as 0.05.

Results

Table 1. Data summary for swimmers by their gender.

Variables	Girls (N=9)		Boys (N=12)	
	Mean	Std. deviation	Mean	Std. Deviation
Age (years)	11,57	1,51	11,67	1,37
Height (m)	1,46	0,10	1,47	0,11
Weihgt (kg)	39,57	9,82	41,28	12,56

The mean (SD) age was 11,57±1,51 years, high was 1,46±0,10 m, and weight was 39,57±9,82 for the 9 girls; the mean (SD) age was 11,67±1,37 years, high was 1,47±0,11 m, and weight was 41,28±12,56 for the 12 boys.

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Table 2. Agility values of boys and girls by their different starting positions

Variables		Girls (N=9)		Boys (N=12)	
		Mean (sn)	Std. deviation	Mean (sn)	Std. deviation
The left side of the starting line	The first ten meters	3,24	0,11	3,09	0,34
	The second ten meters	3,11	0,20	2,99	0,30
	Agility	6,35	0,25	6,08	0,63
The right side of the starting line	The first ten meters	3,30	0,11	3,08	0,32
	The second ten meters	3,13	0,14	2,94	0,33
	Agility	6,43	0,22	6,02	0,63
The backward of the starting line	The first ten meters	3,22	0,13	3,16	0,25
	The second ten meters	2,92	0,27	2,91	0,31
	Agility	6,14	0,35	6,07	0,49

The mean (SD) the first ten meters in pro-agility test was 3,24±0,11 seconds, the mean (SD) the second ten meters in pro-agility test was 3,11±0,20 seconds, and the mean (SD) pro-agility test was 6,35±0,25 seconds for the left side of the starting line; the mean (SD) the first ten meters in pro-agility test was 3,30±0,11 seconds, the mean (SD) the second ten meters in pro-agility test was 3,13±0,14 seconds, and the mean (SD) pro-agility test was 6,43±0,22 seconds for the right side of the starting line; the mean (SD) the first ten meters in pro-agility test was 3,22±0,13 seconds, the mean (SD) the second ten meters in pro-agility test was 2,92±0,27 seconds, and the mean (SD) pro-agility test was 6,14±0,35 seconds for the backward of the starting line in girls. The mean (SD) the first ten meters in pro-agility test was 3,09±0,34 seconds, the mean (SD) the second ten meters in pro-agility test was 2,99±0,30 seconds, and the mean (SD) pro-agility test was 6,08±0,63 seconds for the left side of the starting line; the mean (SD) the first ten meters in pro-agility test was 3,08±0,32 seconds, the mean (SD) the second ten meters in pro-agility test was 2,94±0,33 seconds, and the mean (SD) pro-agility test was 6,02±0,63 seconds for the right side of the starting line; the mean (SD) the first ten meters in pro-agility test was 3,16±0,25 seconds, the mean (SD) the second ten meters in pro-agility test was 2,91±0,31 seconds, and the mean (SD) pro-agility test was 6,07±0,49 seconds for the backward of the starting line in boys.

Table 3. Comparison of the data extracted from various start positions in terms of gender

Variables	**Boys**				**Girls**			
	Sum of squares	Mean square	F	P	Sum of squares	Mean square	F	P
The first ten meters	0,047	0,023	0,248	0,782	0,028	0,014	1,054	0,369
The second ten meters	0,035	0,017	0,178	0,837	0,188	0,094	2,130	0,148
Agility	0,028	0,014	0,041	0,960	0,333	0,166	2,165	0,144

As shown, we did not find any statistical differences with regard to first ten-meter start, second ten-meter start, and agility test values of girls swimmers ($p>0.05$). Also, we did not find any statistical differences with regard to first ten-meter start, second ten-meter start, and agility test values of boys swimmers ($p>0.05$)

Discussion

We did not find any statistical differences with regard to first ten-meter start, second ten-meter start, and agility test values of girls swimmers ($p>0.05$). Also, we did not find any statistical differences with regard to first ten-meter start, second ten-meter start, and agility test values of boys swimmers ($p>0.05$). Agility is the ability to maintain and control correct body position while quickly

changing direction through a series of movements (Twist and Benicky 1995). There are many field agility tests including the pro agility, T-Test, and hexagon test (Harman and Garhammer 2008). The agility in 11-year-old girls and boys have not been well measured for swimming until now. First of all, we can find no published literature on different starting positions in agilty in sport branches. The agility has been an important component of physical exercise programs. The most of the sports which are ranked highest for agility require changes of direction in response to a stimulus. The most of the agility measurement tests are rather complex and require a coordinated expression of the force of various lower limb muscles, which is often accompanied by synergistic muscular function of the torso and upper limbs (Colby et al. 2000). The relationship between balance and agility measures was higher in men than in women (Sekulic et al.2013). Highly related values among the applied agility tests show that 14-year-old players achieved the specific ''universal'' qualities in performances requiring directional changes. A high correlation between results in agility tests was achieved (Jakovljevic et al.2012). In contrast, 12-year-old players have not yet achieved these qualities, because at this age, the level of neuromuscular coordination is lower (Barber-Weastin et al. 2005). Oxyzoglou et al. (2009) reported significantly better agility test results in preadolescent boys engaged in 6-months, 3 hours-week 21, specific handball training compared with a mainstream physical education program. Swimmers have to whole body motions requiring quick movement such as a quick turn for turns back in pool. In this study, it was concluded that remarkable change did not occur from examining agility performances of different start positions.

Conclusions.The agility in the girls and boys did not have a significant effect in different start positions. So coaches can practice agility every position.

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EFFECT OF VERTICAL JUMP ON QUICKNESS, AGILITY, ACCELERATION AND SPEED PERFORMANCE IN CHILDREN SWIMMER

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Abstract
The purposes of this study were to examine effect of vertical jump on quickness, agility, acceleration, and speed performance.
Method. A total of 20 girls and boys swimmers volunteered to participate in this research. The mean (SD) age was 11,50±1,64 years, height was 1,46±0,11 m, and weight was 40,50±10,02 kg for the 8 girls swimmers. The mean (SD) age was 11,40±1,59 years, height was 1,45±0,12 m, and weight was 39,80±13,58 kg for the 12 boys swimmers. we applied a testing procedure that included measurements of the quickness, acceleration, speed, agility, and vertical jump. We was applied pro-agilty test for agility. Quicness was evaluated for 5 m. Acceleration was evaluated using a 15 m. Speed was evaluated using a 50 m test. Vertical jump evaluated using a jumping mat with electronic system. Each test was applied three times, with a 3-minute interval, and the best result was recorded.
*Results.*A significant relationship existed between quickness, agility, acceleration and speed with vertical jumping ($P<0.05$). A unit increase in vertical jumping lead to a change in the rate of 0,9 %, 5,5 %, 2,4 % and 9 % respectively in quickness, agility, acceleration and speed performance. In conclusion, when swimmers have highest vertical jump, they can more success in agility and speed. This skills is important for quickly turns, fathoms.
Conclusions. Vertical jump effected quickly less than acceleration. This situation may change to another branch of sport and age group.
*Key words***:** Swimming, vertical jump, girls and boys, sports.

Introduction

Swimming is a very demanding sport that requires extreme muscle strength, quickness, and endurance (Balilionis et al. 2012). Speed, quickness, and agility training is perfect for seniors because it will condition fitness aspects that are generally lost with age-speed, agility and quickness (Miller et al. 2001). Linear actions such as acceleration and top end speed can be affected by changing the mechanics of the arms or legs. Agility actions are more common in athletic events and may require a higher degree of coordination. Agility requires the integration of several biomotor skills such as dynamic balance, muscular coordination, effective core development, and stretch shortening cycle development (Brown and Vescovi 2003). High-speed actions during sport competition can be categorized into actions requiring agility and acceleration. Acceleration is the rate of change in velocity that allows a player to reach maximum velocity in a minimum amount of time (Little and Williams 2005). Accelerating from a stationary position or a moving start requires high force generation capacity to overcome the body's inertia. Quickness is considered both a multidirectional skill that combines explosiveness, reactiveness, and acceleration and agility while incorporating flexibility, strength, and neuromuscular coordination by allowing the athlete to move at a higher rate of speed (Brown and et al. 2000). The limiting factor in sprinting is the vertical jumping due to the acceleration of gravity and because high horizontal jumping production is requested (Schleihauf 2004)**.** Vertical jump is a fundamental part of the many sports. Vertical jump testing is a common method used by coaches to assess jump height and muscular power (Bobbert et al. 1996; Hespanhol et al. 2007; Lara et al. 2006; Ravn et al. 1999). Vertical jump is a measurement that coaches, strength and conditioning professionals frequently use as an objective functional measurement (Leard et al 2007). On agility-related investigation found that T-test performance could be predicted from leg power, leg speed, and agility, again suggesting a relationship between sprinting characteristics and agility (Pauole et al 2000). Start performance in swimming is a combination of reaction time, vertical and horizontal force. Both the vertical and horizontal forces off the block may be trainable with strength and power training, and support for this is provided by the significant correlation between vertical jumping ability and starting performance observed in swimming

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(Pearson et al. 1998). Therefore, the purposes of this study were to examine effect of vertical jump on quickness, agility, acceleration, and speed performance in swimmers.

Material and method

A total of 20 girls and boys swimmers volunteered to participate in this research. The mean (SD) age was 11,50±1,64 years, height was 1,46±0,11 m, and weight was 40,50±10,02 kg for the 8 girls swimmers. The mean (SD) age was 11,40±1,59 years, height was 1,45±0,12 m, and weight was 39,80±13,58 kg for the 12 boys swimmers. we applied a testing procedure that included measurements of the quickness, acceleration, speed, agility, and vertical jump. Before conducting the investigation, all subjects were informed of the risks of the study and gave informed consent. The study was approved by an ethics board and met the conditions of the Helsinki Declaration. Each test was applied three times, with a 3-minute interval, and the best result was recorded. At the beginning of each session, All athletes completed a 10 minute dynamic warm-up consisting of jogging, dynamic stretching and submaximal sprints. Automated timers, mat, cone, and tape measure for distance were used. Timing of all repetitions was measured by an electronic timing system (Smart speed lite system, Fusion sport, 2010). The beam was set at a height of 0.5 meters above the start/finish line. Subjects' height is measured with an instrument sensitive to 1 mm. Their body weight is measured with a weigh-bridge sensitive up to 20 g while they are dressed in only shorts (and no shoes). Height variable is in terms of meters, and body weight variable is in terms of kilograms.

Testing Procedure

Pro agility test

The subjects started on a centerline. The subjects sprinted 4.57 m to the left, then 9.14 m to the right, and finally 4.57 m back to finish as they crossed the centerline. Test was applied three times, with a 3-minute interval, and the best result was recorded for statistical analysis.

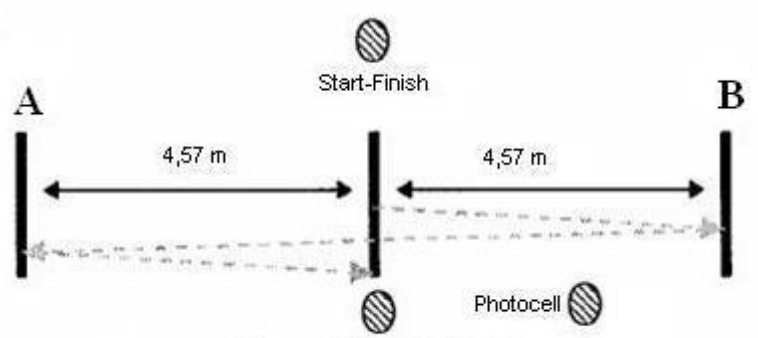

Figure 1. Pro-Agility Test

Quickness, acceleration, and speed tests

Photocells were placed at the start, 5 m (quickness), 15 m (acceleration), and 50 m (speed) in order to collect sprint times over the 3 distances. The starting position was standardized for all subjects. Athletes started in a 2- point crouched position with the left toe approximately 30 cm back from the starting line and the right toe approximately in line with the heel of the left foot. All subjects wore rubber-soled track shoes. Therefore, Quicness was evaluated for 5 m. Acceleration was evaluated using a 15 m. Speed was evaluated using a 50 m test. Tests were applied three times, with a 3-minute interval, and the best result was recorded for statistical analysis.

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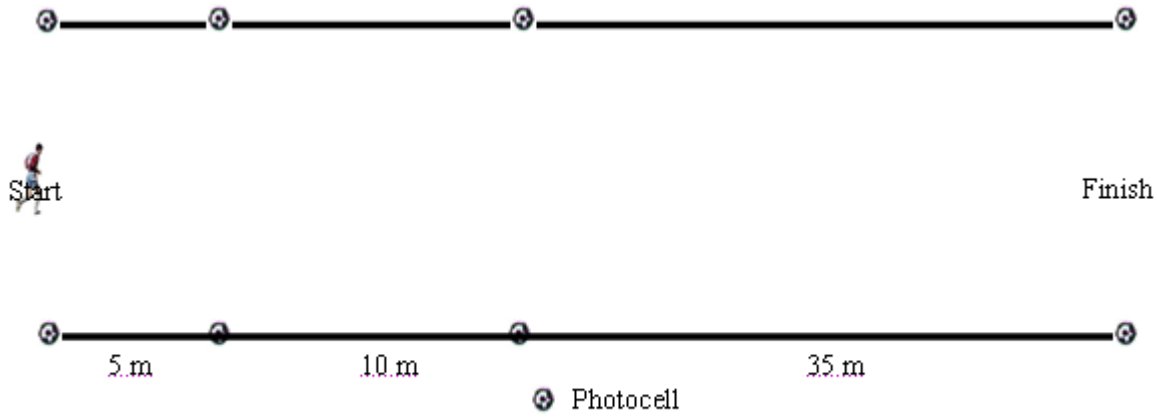

Figure 2. Quickness test for 5 m, acceleration test for 15 m, and speed test for 50 m.

Figure 3. Equipment for vertical jump test

Statistical Analysis

SPSS 16.0 statistical program was used for evaluation and calculation of the data. The data was summarized and evaluated by the means and standard deviations. To explain relationship between measurements, Pearson Correlation analysis was used according to the results of the test of normality, and linear regression analysis was used to predictive power of explanation on vertical jumping of quickness, agility, acceleration and speed. The significance level was taken as 0.05.

Results

Table 1. Data summary for swimmers by their gender.

Variables	Female (N=8)		Male (N=15)	
	Mean (sec)	Std. deviation	Mean (sec)	Std. deviation
Age (yıl)	11,50	1,64	11,40	1,59
High (m)	1,46	0,11	1,45	0,12
Weight (kg)	40,50	10,02	39,80	13,58

The mean (SD) age was 11,50±1,64 years, high was 1,46±0,11 m, and weight was 40,50±10,02 for the 8 female; the mean (SD) age was 11,40±1,59 years, high was 1,45±0,12 m, and weight was 39,80±13,58 for the 15 male.

Table 2. Data summary for swimmers by their gender.

Variables	Female (N=8)		Male (N=15)	
	Mean (sec)	Std. Deviation	Mean (sec)	Std. deviation
Quickness	1,31	0,09	1,36	0,10
Agility	6,28	0,19	5,87	0,41
Acceleration	3,06	0,22	3,02	0,21
Speed	8,85	0,85	8,91	0,70

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Vertical jump	23,29	7,11	27,48	4,82

The mean (SD) quickness was 1,31±0,09 seconds, agility was 6,28±0,19 seconds, acceleration was 3,06±0,22 seconds, and speed was 8,85±0,85 seconds, and vertical jump was23,29±7,11 for the 8 female; the mean (SD) quickness was 1,36±0,10 seconds, agility was 5,87 ±0,41 seconds, acceleration was 3,02±0,21 seconds, and speed was 8,91±0,70 seconds, and vertical jump was 27,48±4,82 for the 15 male.

Table 3. Analaysis of regression between quickness, agility, acceleration, speed with vertical jumping

Dependent variables	Variables	B	Standart hata	Beta	T	P
Quickness	Vertical jumping	-0,009	0,004	-0,494	-2,270	0,037
	$R = 0,494$ $R^2 = 0,244$	$F = 5,152$	$P = 0,037$			
Agility		-0,055	0,012	-0,766	-4,621	0,000
	$R = 0,766$ $R^2 = 0,587$	$F = 21,351$	$P = 0,000$			
Acceleration		-0,024	0,005	-0,741	-4,419	0,000
	$R = 0,741$ $R^2 = 0,550$	$F = 19,529$	$P = 0,000$			
Speed		-0,090	0,021	-0,733	-4,313	0,001
	$R = 0,733$ $R^2 = 0,538$	$F = 18,606$	$P = 0,001$			

As shown Table 1, the model is found to be meaningfull in the regresssion results of vertical jumping (P<0,05). A significant relationship existed between quickness, agility, acceleration and speed with vertical jumping (P<0.05). A unit increase in vertical jumping lead to a change in the rate of 0,9 %, 5,5 %, 2,4 % and 9 % respectively in quickness, agility, acceleration and speed performance.

Discussion

In this study, a significant relationship existed between quickness, agility, acceleration and speed with vertical jumping (P<0.05). A unit increase in vertical jumping lead to a change in the rate of 0,9 %, 5,5 %, 2,4 % and 9 % respectively in quickness, agility, acceleration and speed performance. Several studies have examined the influence of different physiological parameters in swimming (Holmer and Gulstrand 1980; Town and Vanness 1990; West et al. 2005). But no studies have evaluated the vertical jump, agility, acceleration, speed, and quicknes in swimming. Mero and colleagues (Mero et al. 1981) saw a significant correlation between sprinting performance and jumping tests. Barnes et al. (2007) found the relationship between agility and jumping performance. It indicates that individuals with greater countermovement performance also have quicker agility times and suggests that training predominantly in the vertical domain may also yield improvements in certain types of agility performance. Also, it reported in agreement with other studies that examine sprinting performance. Hennessy and Kilty (2001) also found that countermovement, drop jump, and bounding jump tests relate to sprinting performance. Both the countermovement and drop jump test were found to explain 63% of sprinting performance; however, the drop jump test explained 55% of the relationship. In a previous study (Sheppard et al. 2008) was examined the potential strength, power, and anthropometric contributors to vertical jump performances. Very strong correlations were observed between relative (absolute height-standing reach height) depth jump performance and relative counter-movement vertical jump (0.93; $p \leq 0.01$). The single best regression model component for relative counter-movement vertical jump was the relative depth jump performance, explaining 84% of performance. The role of maximum strength in jumping performance was not clear but speed-strength qualities were considered important. It was concluded that reactive strength is relatively more important for jumping from a run-up than for the standing vertical jump, and this should be reflected by appropriate training methods and test protocols for the assessment of athletes who jump (Young et al. 1999). Hoffman et al. (1996) found the important relationships between leg strength, vertical jump, speed, and agility on playing time.

Conclusion, when swimmers have highest vertical jump, they can more success in agility and speed. This skills is important for quickly turns, fathoms. Vertical jump effected quickly less than acceleration. This situation may change to another branch of sport and age group.

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ATTENTION EVALUATION IN WEIGHTLIFTERS

TEODORU MARIAN[1], MURARETU DANIEL[1]

Abstract

Purpose. One of the most important qualities in weightlifting is attention, as a psychic phenomenon that supports the psychomotor activities. In this sense, our purpose was to study the attention capacity in top performance weightlifters.

Methods. In order to develop our research, we selected 5 top performance weightlifters (boys) aged 26 to 34 years old, components of the "Steaua" Sports Club of Bucharest. We selected our subjects according to the performance criterion, all of them being masters of sports. The research included many stages (we mention that the present research is in progress, reason for which we present only the subjects' results in the initial evaluation), as follows: 1st stage: subject selection; 2nd stage: initial evaluation; 3rd stage: training program for the attention enhancement; 4th stage: final evaluation. For the attention evaluation, we used the Prague test (distributed attention) and the Toulouse-Pieron test (concentrated attention).

Results. After the administration of the distributed attention and the concentrated attention tests, we found out that the investigated subjects registered different scores ("poor", "average", "good").

Conclusions. The analysis of the subjects' partial results suggests that their performances result from the compensation with other psychomotor qualities.

*Key-words***:** attention, evaluation, weightlifting.

Introduction

Athletes are submitted to multidirectional efforts and, in this sense, sports performance is influenced by numerous factors. One of the most important qualities in weightlifting is attention. According to F. Macar (1999), attention is a "multidimensional concept". Attention is a "psychic process, a psychic state, a condition facilitating or perturbing the other psychic phenomena" (Zlate, 2006). "In daily life, the attention involvement is also appreciated as a success-generating factor, while the attention diminution or absence, as a failure-generating factor" (Golu, 2005). M. Epuran (2001) states that attention is a "prerequisite for the awareness of the entire psycho-behavioral life; without it, no external or internal information can be efficiently received or processed". In the final part of this introduction, we want to specify the fact that "there are two totally distinct forms of attention: one is spontaneous, natural (this is the authentic, primitive, basic form of attention) and one is voluntary, artificial (resulted from education, training. It fully extracts its substance from the spontaneous attention" (Ribot, 2000).

Methods

In order to develop our research, we selected 5 top performance weightlifters (boys) aged 26 to 34 years old, components of the "Steaua" Sports Club of Bucharest. Their sports experience in the weightlifting domain is comprised between 13 and 23 years. We selected our subjects according to the performance criterion, all of them being masters of sports.

In this research, we present the subjects' results in the initial evaluation, respectively in the attention tests: the Prague test - for the distributed attention, and the Toulouse-Pieron test - for the concentrated attention.

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Results

Table 1. Subjects of the research

Crt. no.	Surname and name	Year of birth	Sports classification	Weight class	Sports experience
1.	A.M.	1979	Master of sports	105 kg	22 years
2.	M.I.	1983	Master of sports	85 kg	16 years
3.	O.S.	1981	Master of sports	62 kg	19 years
4.	B.T.	1987	Master of sports	79 kg	17 years
5.	P.V.	1985	Master of sports	77 kg	13 years

Table 2. Results obtained in the Prague distributed attention test - Initial testing - Subject A.M.

Minute	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Correct numbers – minute	6	0	2	3	1	5	6	3	4	2	4	4	7	3	2	7	59

After the administration of the Prague distributed attention test, we can notice that the subject A.M. has an average level of the distributed attention, with fluctuations of the attention, and a more difficult integration into the task; although in minute 1 he identified 6 numbers, in the next 4 minutes his performances were poor: minute 2 - 0 numbers, minute 3 - 2 numbers, minute 4 - 3 numbers, minute 5 - 1 number.

The administration of the Toulouse-Pieron barrage test emphasizes a low level of the concentrated attention. The Cs/Is/Os ratio, expressed by the coefficient of accuracy indicator, reflects a low level of the attention (C_{EX} for the whole test = 0.25), but the values indicate an ascendant trend (the lowest value being in minute 1: C_{EX} for min. 1 = 0.21, and the highest value in minute 4: C_{EX} for min. 4 = 0.33). This may prove that the subject has a good capacity of adaptation to the task and also a good learning capacity, as we can see in the table below.

Table 3. Results obtained in the Toulouse-Pieron concentrated attention test - Subject A.M.

Minute	Correct signs (Cs)	Incorrect signs (Is)	Omitted signs (Os)	Coefficient of accuracy
1	11	4	21	0.21
2	9	2	18	0.25
3	8	1	22	0.23
4	11	0	22	0.33
Total signs	39	7	83	0.25

Table 4. Results obtained in the Prague distributed attention test - Initial testing - Subject M.I.

Minute	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Correct numbers - minute	5	3	1	4	4	4	5	2	1	3	6	3	5	4	6	4	60

The administration of the Prague distributed attention test indicates that the subject M.I. has an average level of the distributed attention, with fluctuations of the attention, and a more difficult integration into the task; although in minute 1 he identified 5 numbers, in the next 4 minutes his performances were poor: minute 2 - 3 numbers, minute 3 - 1 number, minute 4 - 4 numbers, minute 5 - 4 numbers.

After the administration of the Toulouse-Pieron barrage test, the subject's results indicate a low level of the concentrated attention. The Cs/Is/Os ratio, expressed by the coefficient of accuracy indicator, reflects a low level of the attention (C_{EX} for the whole test = 0.25), but the values indicate an ascendant trend (the lowest value being in minute 1: C_{EX} for min. 1 = 0.21, and the highest value in minute 4: C_{EX} for min. 4

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= 0.33). This may prove that the subject has a good capacity of adaptation to the task and also a good learning capacity, as we can see in the table below.

Table 5. Results obtained in the Toulouse-Pieron concentrated attention test - Subject M.I.

Minute	Correct signs	Incorrect signs	Omitted signs	Coefficient of accuracy
1	2	4	21	0.21
2	9	2	18	0.25
3	8	1	22	0.23
4	11	0	22	0.33
Total signs	30	7	83	0.25

Table 6. Results obtained in the Prague distributed attention test - Initial testing - Subject O.S.

Minute	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Correct numbers - minute	3	3	3	2	1	0	3	0	1	2	3	4	6	2	1	2	36

The administration of the Prague distributed attention test indicates that the subject O.S. has an average level of the distributed attention, with fluctuations of the attention, a more difficult integration into the task and an increased fatigability.
After the administration of the Toulouse-Pieron barrage test, the subject's results indicate a good level of the concentrated attention. The Cs/Is/Os ratio, expressed by the coefficient of accuracy indicator, reflects an average level of the attention (C_{EX} for the whole test = 0.59), this coefficient values indicating fluctuations of the concentrated attention, as we can see in the table below.

Table 7. Results obtained in the Toulouse-Pieron concentrated attention test - Subject O.S.

Minute	Correct signs	Incorrect signs	Omitted signs	Coefficient of accuracy
1	18	3	9	0.55
2	19	0	5	0.79
3	16	5	3	0.57
4	13	4	7	0.45
Total signs	66	12	24	0.59

Table 8. Results obtained in the Prague distributed attention test - Initial testing - Subject B.T.

Minute	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Correct numbers - minute	5	4	2	3	5	3	4	6	5	5	0	3	4	5	5	6	65

The administration of the Prague distributed attention test indicates that the subject B.T. has an average level of the distributed attention and a more difficult integration into the task; although in minute 1 he identified 5 numbers, in the next 3 minutes his performances were poor: minute 2 - 4 numbers, minute 3 - 2 numbers, minute 4 - 3 numbers.

After the administration of the Toulouse-Pieron barrage test, the subject's results indicate a good level of the concentrated attention. The Cs/Is/Os ratio, expressed by the coefficient of accuracy indicator, reflects a good level of the concentrated attention (C_{EX} for the whole test = 0.75), as we can see in the table below.

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Table 9. Results obtained in the Toulouse-Pieron concentrated attention test - Subject B.T.

Minute	Correct signs	Incorrect signs	Omitted signs	Coefficient of accuracy
1	25	5	1	0.76
2	24	4	3	0.74
3	19	3	4	0.69
4	27	4	1	0.82
Total signs	95	16	9	0.75

Table 10. Results obtained in the Prague distributed attention test - Initial testing - Subject P.V.

Minute	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Correct numbers - minute	6	7	2	6	3	5	3	4	4	3	6	0	6	1	5	4	65

The administration of the Prague distributed attention test indicates that the subject P.V. has an average level of the distributed attention, with fluctuations of the attention, a more difficult integration into the task and a tendency to fatigability.

After the administration of the Toulouse-Pieron barrage test, the subject's results indicate a good level of the concentrated attention (Sc = 87). The Cs/Is/Os ratio, expressed by the coefficient of accuracy indicator, reflects a good level of the concentrated attention (C_{EX} for the whole test = 0.81) and the values indicate an ascendant trend (the lowest value being in minute 1: C_{EX} for min. 1 = 0.55 and the highest value in minute 4: C_{EX} for min. 4 = 1). This may prove that the subject has a good capacity of adaptation to the task and also a good learning capacity, as we can see in the table below.

Table 11. Results obtained in the Toulouse-Pieron concentrated attention test - Subject P.V.

Minute	Correct signs	Incorrect signs	Omitted signs	Coefficient of accuracy
1	22	0	18	0.55
2	20	1	5	0.76
3	18	0	1	0.94
4	27	0	0	1
Total signs	87	1	24	0.81

Discussions

The way in which the athletes are able to concentrate may lead to the achievement of higher performances.

The concentration level and duration are closely related to the specific activities performed by the weightlifters.

Although the athletes have a different experience in the field and participate in different classes, their distributed attention is low (athlete O.S.) and, respectively, good (athletes A.M., M.I., B.T. and P.V.).

The concentrated attention testing emphasizes a low level (athletes A.M. and M.I.) and, respectively, a good level (athletes O.S., B.T. and P.V.).

All the athletes present fluctuations of the attention during the testing.

We must also mention here the results obtained by (Baroga, 1973) in a research on the concentration time. The author used a stopwatch, in order to objectify the athletes' concentration time. In the same train of ideas, we want to mention the research conducted by (Collet, 2002) who provides information about the cerebral cortex activation level. This author's studies lead to hypotheses concerning the variation of the attention concentration during the respective action.

Conclusions

Although the sports performances of the tested subjects are remarkable, the level of their distributed and concentrated attention is low, a situation that imposes a specific training program, which, in our opinion, would lead to an increase of their sports performances.

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THE ANTHROPOMETRIC DATA IMPORTANCE TO KARATE-DO

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Abstract
Purpose. Within our scientific approach, we took into account the most important anthropometric measurements that can influence the strike efficiency in relation to the fighter's stance during a Karate-do competition.
Methods. To perform the anthropometric measurements (age, weight, height, length of the upper and lower limbs), we used the same tools for all the 10 selected subjects, top performance athletes at the national level.
Results. The data collected through anthropometric measurements are better valorized when they are included into different formulae, in order to determine a series of anthropometric indices, such as those related to proportionality, which aim at assessing the growth and development phenomena. We can thus make comparisons among subjects or groups of subjects, relying on some objective criteria. For each of these values, we calculated the following indicators: arithmetical mean, median, standard deviation, mean deviation, dispersion, amplitude, coefficient of variation.
*Conclusions***.** Statistical analyses showed that our sample was homogeneous in relation to the subjects' age, height, length of the upper limb, length of the lower limb and body mass, and relatively homogeneous in relation to the their weight.
Key-words: anthropometric data, Karate-do.

Introduction

In performance sports, the physical development level or the constitutional biotype has always been a parameter to be taken into account when we aim at obtaining the best results. Among the methods used in the sports domain, we can mention somatoscopic examination and anthropometric examination (Mircea, 1989).
Anthropometric examination is a method through which we perform some measurements of the human body that indicate the athlete's physical growth and development (Epuran, 2005).
Among the most usual measurements, we enumerate: body weight, body height, length of the upper limbs, length of the lower limbs, thoracic perimeter (Dragnea, 1984). On the basis of these measurements, we can calculate different anthropometric indices that give us a picture of the growth and development level, respectively the parameters enabling us to make comparisons among the performance athletes and, last but not least, the aspects we are interested in, because they are correlated to our domain specificity (they influence the efficiency of the performed technical elements: strikes, stances etc.).
The Karate-do discipline has characteristics that impose the technical staff to select those human individuals who, from the somatic point of view, fully correspond to the model, respectively to the efforts specific to the discipline.

Methods

The research included three distinct stages: 1st stage: subject selection (based on their performances); 2nd stage: subject measurement; 3rd stage: processing and interpretation of the collected data.
In order to develop our research, we performed the measurements considered by us to be the most important to the Karate-do activity, namely: weight, height, length of the upper limbs, length of the lower limbs and, respectively, the calculation of the following indicators: body mass index, index of proportionality, Quetelet's index, index of proportionality of the upper and lower limbs.
The selected subjects belong to the rural environment

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and their age is comprised between 21 and 24 years old. They are components of the Suiko Sports Club and practitioners of Karate-do, shito-ryu style. All the 10 tested subjects are champions at different national championships (for children, cadets, juniors or youth).
We mention that all the measurements were performed with the same tools.

Results

After the anthropometric measurements performed on the selected athletes, we calculated, for all the indicators taken into account, the following indicators: arithmetical mean, median, standard deviation, mean deviation, dispersion, amplitude, coefficient of variation.
At the same time, we calculated the following indicators: body mass index, index of proportionality, Quetelet's index, index of proportionality of the upper and lower limbs.

Table 1. Subjects of the research

Crt. no.	Surname and name	Age	Weight	Height
1.	M.M.	22 years old	70 kg	1.84 m
2.	B.L.	21 years old	64 kg	1.68 m
3.	V.V.	21 years old	70 kg	1.75 m
4.	V.M.	23 years old	84 kg	1.83 m
5.	M.L.	23 years old	70 kg	1.73 m
6.	Z.V.	24 years old	70 kg	1.73 m
7.	M.N.	23 years old	86 kg	1.78 m
8.	M.S.	23 years old	80 kg	1.83 m
9.	S.V.	23 years old	63 kg	1.68 m
10.	A.M.	21 years old	72 kg	1.76 m

Table 2. Statistical indicators - Weight

WEIGHT	STATISTICAL INDICATORS						
	Arithmetical mean	Median	Standard deviation	Mean deviation	Dispersion	Amplitude	Coefficient of variation
Kg		70.00	7.87	6.26	61.88	23.00	10.79%

Table 3. Statistical indicators - Height

HEIGHT	STATISTICAL INDICATORS						
	Arithmetical mean	Median	Standard deviation	Mean deviation	Dispersion	Amplitude	Coefficient of variation
cm	1.761	1.755	0.06	0.05	0.003	0.16	3.35%

Table 4. Statistical indicators - Length of the upper limb

LENGTH OF THE UPPER LIMB	STATISTICAL INDICATORS						
	Arithmetical mean	Median	Standard deviation	Mean deviation	Dispersion	Amplitude	Coefficient of variation
cm	75.30	76.50	4.99	3.58	24.900	15.00	6.63%

Table 5. Statistical indicators - Length of the lower limb

LENGTH OF THE LOWER LIMB	STATISTICAL INDICATORS						
	Arithmetical mean	Median	Standard deviation	Mean deviation	Dispersion	Amplitude	Coefficient of variation
cm	93.40	95.00	7.60	5.80	57.822	24.00	8.14%

Table 6. Statistical indicators - Body mass index

BODY MASS INDEX	STATISTICAL INDICATORS						
	Arithmetical mean	Median	Standard deviation	Mean deviation	Dispersion	Amplitude	Coefficient of variation
Kg/m^2	23.47	23.32	1.71	1.14	2.94	6.47	7.31%

Table 7. Statistical indicators - Index of proportionality

INDEX OF PROPORTIO-NALITY	STATISTICAL INDICATORS						
	Arithmetical mean	Median	Standard deviation	Mean deviation	Dispersion	Amplitude	Coefficient of variation
cm/kg	2.43	2.47	0.20	0.15	0.04	0.60	8.16%

Table 8. Statistical indicators - Quetelet's index

QUETELET'S INDEX	STATISTICAL INDICATORS						
	Arithmetical mean	Median	Standard deviation	Mean deviation	Dispersion	Amplitude	Coefficient of variation
g/cm	413.40	404.62	35.71	27.82	1275.12	108.15	8.64%

Table 9. Statistical indicators - Index of proportionality of the upper limb

INDEX OF PROPORTIONA-LITY OF THE UPPER LIMB	STATISTICAL INDICATORS						
	Arithmetical mean	Median	Standard deviation	Mean deviation	Dispersion	Amplitude	Coefficient of variation
%	42.73%	43.53%	1.84%	1.44%	0.03%	5.29%	4.30%

Table 10. Statistical indicators - Index of proportionality of the lower limb

INDEX OF PROPORTIONA-LITY OF THE LOWER LIMB	STATISTICAL INDICATORS						
	Arithmetical mean	Median	Standard deviation	Mean deviation	Dispersion	Amplitude	Coefficient of variation
%	52.98%	53.22%	2.96%	2.13%	0.09%	9.57%	5.58%

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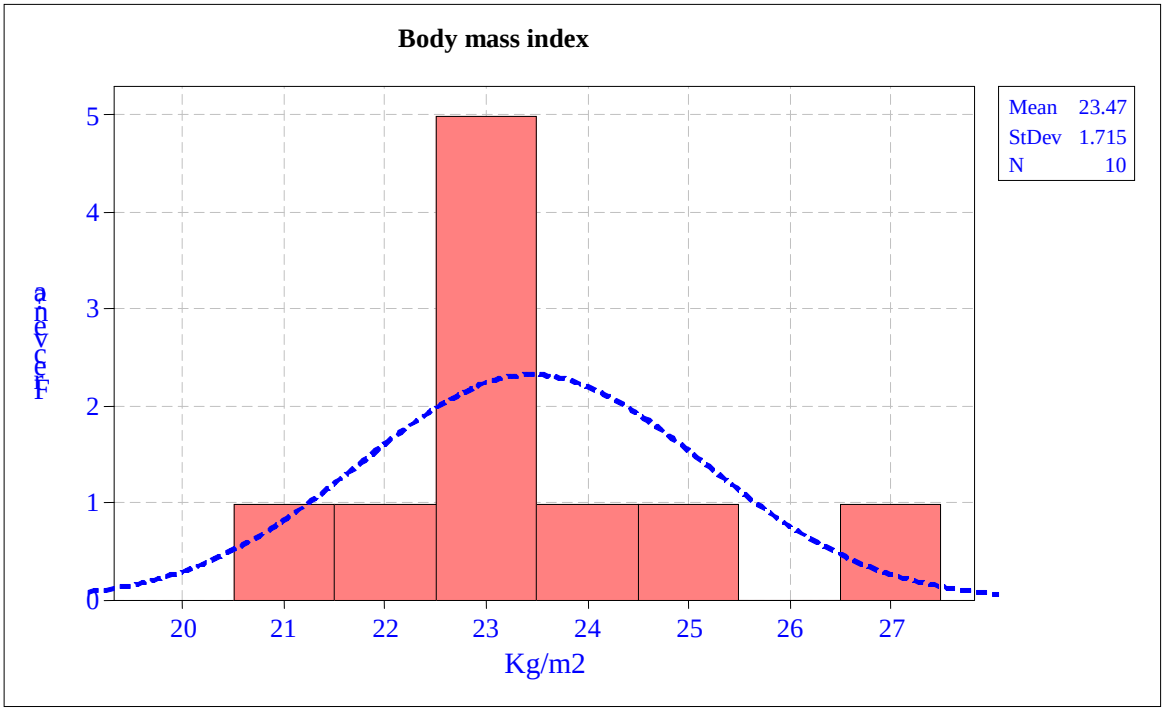

Fig. 1. Graphical interpretation - Body mass index

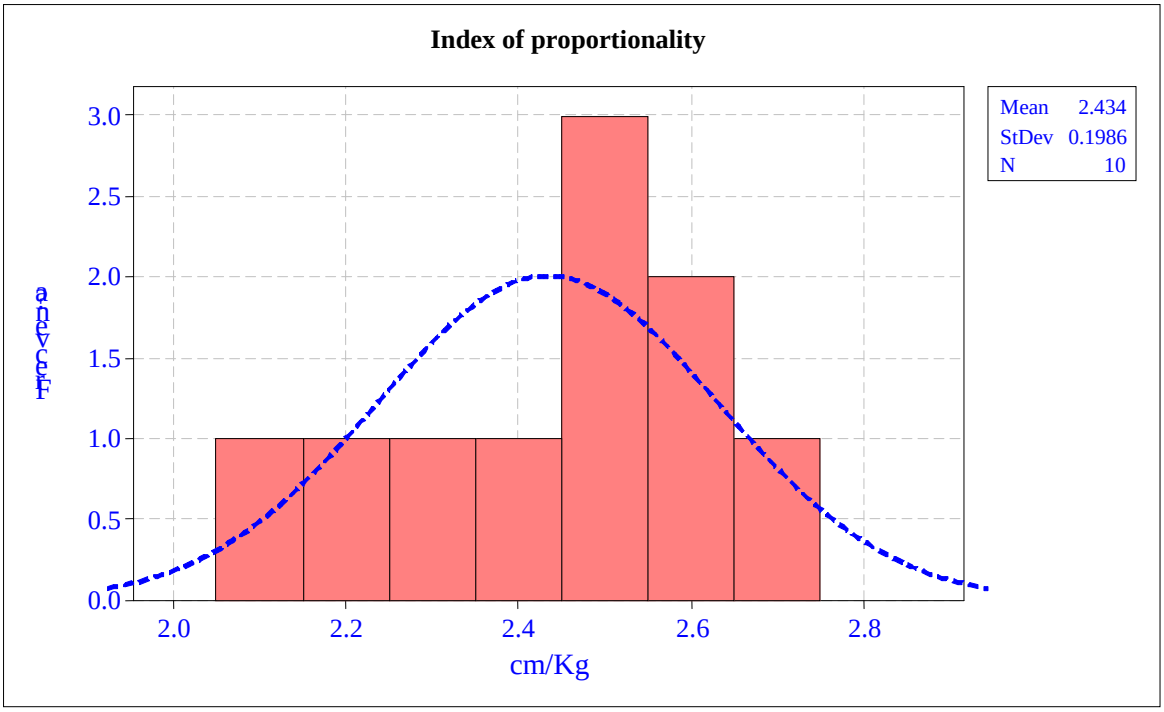

Fig. 2. Graphical interpretation - Index of proportionality

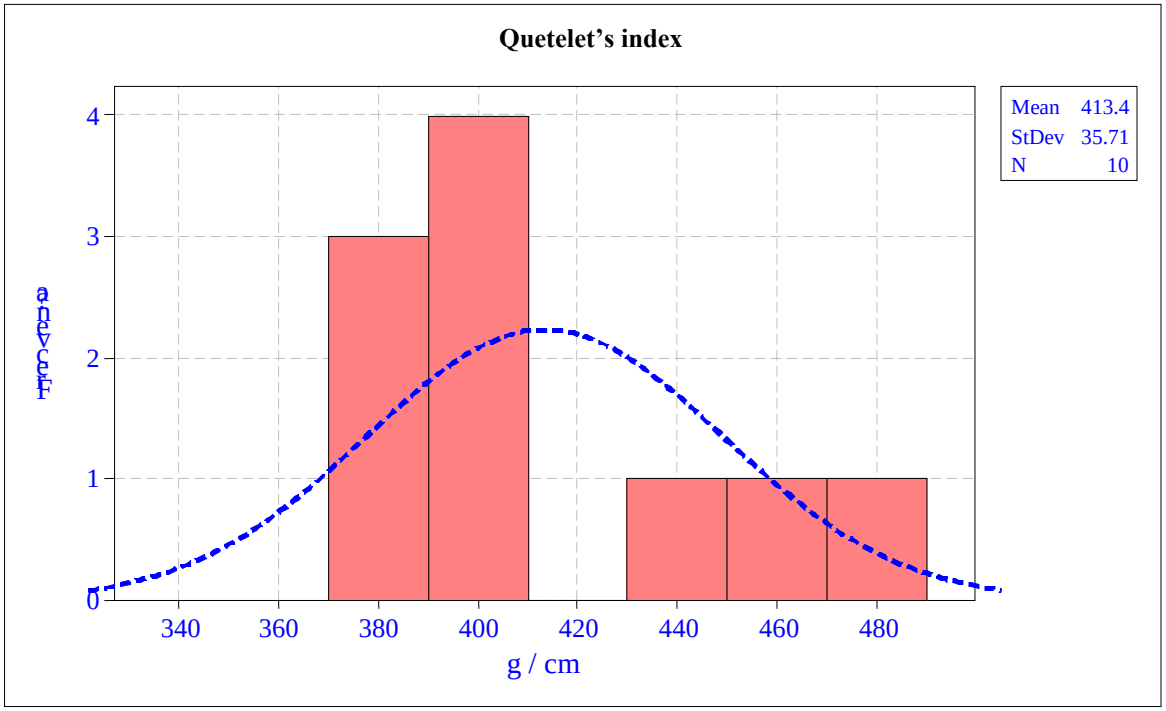

Fig. 3. Graphical interpretation - Quetelet's index

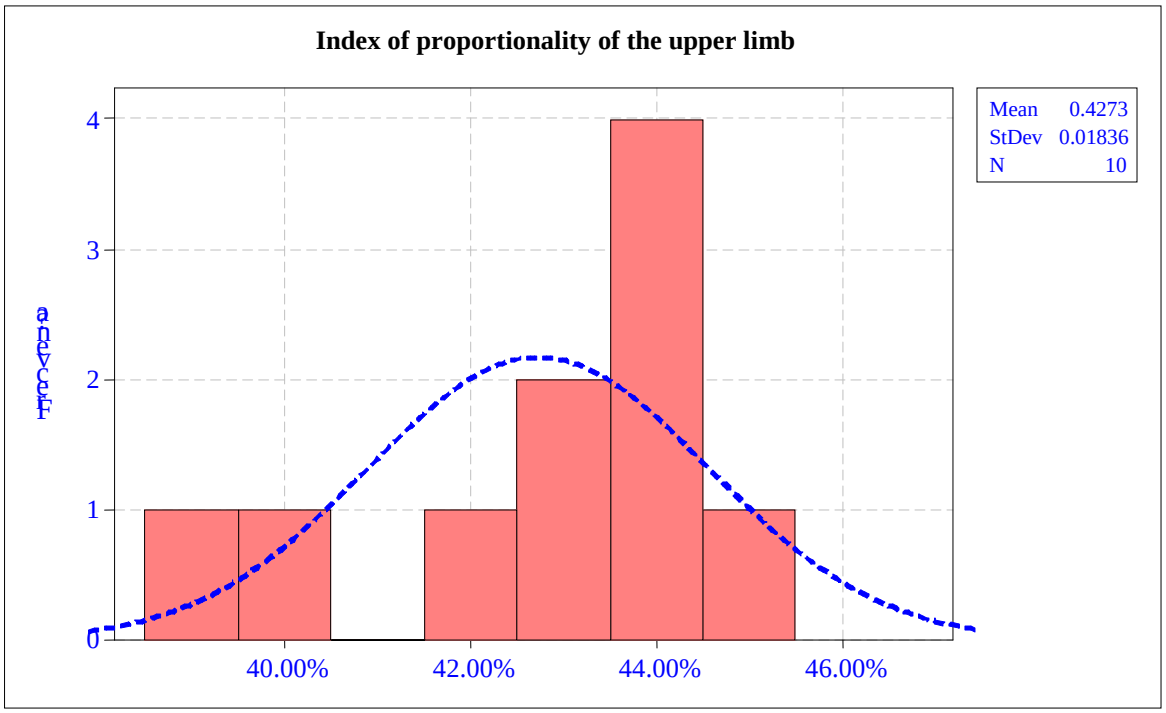

Fig. 4. Graphical interpretation - Index of proportionality of the upper limb

Discussions

Weight: The values calculated for mean deviation, standard deviation and coefficient of variation are equal to 10.79%, which indicates that the sample is relatively homogeneous, this characteristic having values relatively close to the mean.

Height: The values calculated for mean deviation, standard deviation and coefficient of variation are equal to 3.35%, which indicates that the sample is homogeneous, this characteristic having values close to the mean.

Length of the upper limb: The values calculated for mean deviation, standard deviation and coefficient of variation are equal to 6.63%, which indicates that the sample is homogeneous, this characteristic having values close to the mean.

Length of the lower limb: The values calculated for mean deviation, standard deviation and coefficient of variation are equal to 8.14%, which indicates that the sample is homogeneous, this characteristic having values close to the mean.

Body mass index: The values calculated for mean deviation, standard deviation and coefficient of variation are equal to 7.31%, which indicates that the sample is homogeneous, this characteristic having values close to the mean. BODY MASS INDEX – BMI is calculated by dividing the subject's weight in kg to his height expressed in square meters: BMI = W / H^2 in Kg / m^2. BMI assessment scale: below 18.5: thin; 18.5 to 25: normal; 25 to 30: overweight; above 30: obese.Index of proportionality: The values calculated for mean deviation, standard deviation and coefficient of variation are equal to 8.16%, which indicates that the sample is homogeneous, this characteristic having values close to the mean. INDEX OF PROPORTIONALITY – IP is calculated by dividing the subject's height in cm to his weight expressed in kg: IP = H / W in cm / Kg.

Quetelet's index: The mean value of this index includes the group of athletes analyzed in the category of the very corpulent ones or with a corresponding nutritional status. Standard deviation and mean deviation are equal to 35.71, respectively 27.82. The values calculated for mean deviation, standard deviation and coefficient of variation are equal to 8.64%, which indicates that the sample is homogeneous, this characteristic having values close to the mean. QUETELET'S INDEX (nutritional index) – QI is calculated by dividing the subject's weight in grams to his height expressed in centimeters: QI = W / H in g / c. Generally, the adults' nutritional status should correspond to 400 gr /cm. Values below 300 gr / cm indicate low body fatness, therefore an appropriate nutritional status. This is not applicable to the subjects aged 10 to 12 years old, when neither their height nor their weight is completed.

Index of proportionality of the upper limb: The values calculated for mean deviation, standard deviation and coefficient of variation are equal to 4.30%, which indicates that the sample is homogeneous, this characteristic having values close to the mean. INDEX OF PROPORTIONALITY OF THE UPPER LIMB – IPUL is calculated by dividing the length of the upper limb in cm to the subject's height expressed in centimeters. The ratio is multiplied by 100, to be expressed in percents: IPUL = (LUL / H)*100 in %. In men, its values have the following significance: Short arm for an IPUL < 43%, Normally developed arm for an IPUL COMPRISED BETWEEN 43 AND 45.5%, Long arm for an IPMS > 45.5%.Index of proportionality of the lower limb: The values calculated for mean deviation, standard deviation and coefficient of variation are equal to 5.58%, which indicates that the sample is homogeneous, this characteristic having values close to the mean. INDEX OF PROPORTIONALITY OF THE LOWER LIMB – IPLL is calculated by dividing the length of the lower limb in cm to the subject's height expressed in centimeters. The ratio is multiplied by 100, to be expressed in percents: IPLL = (LLL / H)*100 in %. In men, its values have the following significance: Short legs for an IPLL < 51%, Normally developed leg for an IPLL COMPRISED BETWEEN 51 AND 52.5%, Long leg for an IPLL > 52.5% (Petre, 2011).

Conclusion

Statistical analyses for all the discussed parameters show that the sample is homogeneous as to the subjects' age, height, length of the upper limb, length of the lower limb, body mass index, index of proportionality, Quetelet's index, index of proportionality of the upper limb, index of proportionality of the lower limb, and it is relatively homogeneous in relation to their weight.

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DEVELOPMENT OF MUSCLE STRENGTH BY USING BASIC AND COMPLEMENTARY EXERCISES IN BODYBUILDING FOR MASSES

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Abstract

Purpose. Highlighting the contents of bodybuilding workouts by using basic and complementary exercises in bodybuilding for masses.

Methods and procedures. This scientific approach led to a study of case conducted within the Sports Club named „Tonik Fitness Club" of Bucharest, with two athletes aged 24 and 33 respectively, with 4 and 6 years experience in the field. The study was carried out during a period of 4 months (February - May 2012). Tests and control trials have been applied for assessing the development of muscle groups strength, in terms of anthropometric data and tests for pectoral strength, back and lower limbs strength. Two categories of exercises were used during workouts: basic and secondary (complementary).

Results. The results of the research highlight changes of the anthropometric measurements: increase of the perimeter of chest, arms, thighs and calves consistent with weight increase and last, but not least, increase of muscle mass. This shows the effectiveness of using basic and complementary exercises for the development of main muscle groups in the training; this fact is proven by the results of control trials for pectoral muscles, back muscles and legs muscles.

*Discussion and conclusions***.** In the end of the paper we can draw the conclusion that the review of the theoretical materials and practical activities emphasize the fact that the use of both basic and complementary exercises contribute to a more efficient development of main muscle groups during workouts.

*Key words***:** bodybuilding, exercises, muscle groups, strength.

Introduction

Bodybuilding is considered a sport because it includes all elements of the sport – proper and specific training, with its own means and methods, a competitive circuit including organizers, coaches, judges and an impressive number of practitioners. There are many decisive factors on the road towards success of a bodybuilder. It takes an iron will and an incredibly strong motivation to succeed in this sport. As a science, it assumes that everyone who wants to reach the pinnacle of sport mastery of this discipline must have significant notions on anatomy, physiology, biomechanics, nutrition, recovery after effort, etc. As an art, it requires a special artistic sense to create a high aesthetic level program of muscle presentation. A great harmony between movements and musical background is needed (***, 2011).

The difference between bodybuilding and fitness can be seen if we monitor the components on which the workouts focus and if we analyze their ultimate goal. In length of time, bodybuilding involves a training strategy clearly aimed at developing a muscle mass represented as well as possible, obviously without neglecting muscle definition, the symmetrical, balanced and harmonious development. In fitness, muscle mass is placed on the same level as the cardio-respiratory condition and flexibility (Damian, 2006, 68; Chirazi, Ciorbă, 2006).

The muscle has an extraordinary structure, able to convert the chemical energy derived from food into physical (mechanical) energy, thus becoming the element that performs the movement. The musculoskeletal system consists of a number of rigid elements, the bones, which are attached to each other by means of joint structures. Muscles are the dynamic elements that generate the force necessary for moving the bones to one another. The approximately 500 muscles of the human body have different sizes, shapes and actions. They do not act independently but in coordinated manner; they have, depending on the action to perform, leading roles or secondary roles (agonists and antagonist muscles). There are several types of muscular contractions: *isotonic contraction* is the most usual muscle contraction that occurs with changing muscle length and determines joint movement, so it is considered a dynamic contraction; *isometric contraction* – muscle tension increases, but the muscle fibers length does not change, that is why they are also called static; *isokinetic contraction* – is a type of dynamic contraction in which the muscles contract at their maximum capacity on the entire range of motion (Damian, 2006).

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It is particularly known that in order to give muscle volume and thickness to the back, this one must be "attacked" from several angles, each exercise is complementary to other. In this context all exercises work together to achieve the desideratum consisting of setting up a harmonious back, full of power and flexibility. As it is very well known by now, the workouts with free weights are the determining factor in building a solid muscle mass, lacking of depositions of fat and moreover, they are the strongest alternative because they do not require special facilities (***2006).

Regarding the physiological and biomechanical substratum of power, we can divide the factors into two groups, for teaching purposes (Bota, Prodescu, 1997): central factors and peripheral factors. Central factors refer to the activity of the nervous elements generally involved in the elaboration of the voluntary or involuntary orders. The group of central factors includes also: the ability to coordinate the muscles(intramuscular and intermuscular coordination); regulation of muscle tone. The peripheral factors, like the nervous ones, influence the maximal power mainly, but also the other forms of power at a different share. These are: muscle diameter, muscular hypertrophy produced by workouts, muscle volume, muscle structure, energetic reserves, length of muscle fibers and action angle. Other factors that influnce the power are: motivation, age, sex and circadian rhythm.

By muscle strength we understand the abity of muscles to contract for moving the body segments against a load (weight). General strength is the foundation of the entire training program and the maximum strength refers to the largest load that the athlete can handle at one time, also noted as "1RM" (one maximum repetition) (Damian, 2006).

Before we talk about training, we need to understand the systems that provide the energy needed for muscles to contract. There are many forms of energy: *chemical, electrical, electromagnetic, thermal, mechanical, and nuclear*. People get energy from food in the form of carbohydrates, proteins and lipids in different percentages, transformed into heat; the amount of energy released in biochemical reactions is calculated based on the produced heat and is measured in kilocalories. The energy is used for cellular growth and repair, for the active transport of substances (such as calcium and glucose through the cell membrane) but also to produce movement (power is generated at muscular level by the sliding of actin and myosin filaments). That is why the myosin must have ATP as an energy source. The other sources of energy can not be directly used because of the slow action of the cardio-respiratory system, which needs a while to adapt. The ATP can be generated in three ways: ATP-CP system, glycolytic system and oxidative system (Damian, 2006).

The principles of training are pedagogical, philosophical, psychological ideas that underpin the training process. Most of the principles have derived from the principles of sports training. But the bodybuilding has also its own principles, like any distinct sports field(Damian, 2006): principle of interdependence of training, nutrition and recovery; principle of continuity(in training); principle of accessibility; principle of individualization; principle of load progressive increase; principle of periodization; principle of muscular confusion; principle of holistic training; principle of eclectic training; principle of instinctive (intuitive) training; principle of division of the muscle groups per days; principle of muscle groups employment during workouts.

Weider system of training includes all the principles; Joe Weider's merit is that he described these principles and organized them in a unitary system. Many of the principles, very important for the training, have been tested in the course of time at maximum level; the number and the name of these principles changed in proportion as the methodical-biological observations and researches provided the new data absolutely necessary. The combination of the kind of exercises with the working mode per training session and per days in a complex form led to the emergence of these principles divided into three groups, depending on the nature of the workout used and on the execution of the exercises (Sakizlian, 2012).

A. *Principles that help to streamline the training session per cycles*: principle of training cyclization; principle of the training separated per week; principle of double or triple separation of the training; principle of muscular confusion; principle of permanent heating; principle of variation; principle of eclectic training; principle of instinctive training.

B. *Principles that help to improve the organization of training sessions*: principle of sets system; principle of supersets; principle of compound sets; principle of tri-sets; principle of giant sets; principle of intercalated sets; principle of pause–rest; principle of muscle priority; principle of pre-exhaustion; principle of the pyramid; principle of descending sets and principle of instinctive training.

C. *Principles that explain the execution of each exercise*; principle of isolation; principle of cheating; principle of continuous tension; principle of qualitative training; principle of forced reps; principle of irrigation (muscle pumping); principle of arcs; principle of partial reps; principle of negative reps; principle of peak contraction; principle of speed and principle of iso-tension.

The principles are designed to provide permanent incentives and methods to increase the intensity of the workouts gradually. Another classification performed by Prof. Dr. Alexandru Virgil Voicu in his course on bodybuilding, divides Weider principles in three

groups also, but depending on the training level(Sazlian, 2012):

1. Weider principles for beginners
2. Weider principles for athletes with intermediate stage of development
3. Weider principles for athletes with advanced stage of development

Regarding the influence of training sessions and dietary supplements on the adaptive process of the skeletal muscles, or what to do to become massive, one highlights the importance of food for conditioning the muscles throughout the complex process of physical training, by (***2006): composition of muscle protein, body reaction to workouts, decrease of glycemic index, negative net protein balance, increased level of assimilation process, increased concentration of cortisol, etc.

It is interesting to notice that generations of researchers that were against the introduction of alcohol in the programs of weight control might have been wrong. It is obvious that a regular and excessive consumption of alcohol could lead to fattening (Wannamethee, Shaper, 2003). Another element of weight loss affected by alcohol, explained and demonstrated by Dr. Michael Zemel and his team is that dietary calcium intake may prevent fattening (Zemel, 2004). One factor that affect body weight and is influenced by alcohol is angiogenesis. Angiogenesis refers to the development of new blood vessels necessary for growth or active tissue. Pharmaceutical companies prepare anti-angiogenic compounds to fight obesity (Brakenheilm, Cao, et al.., 2004).

The difference between basic exercises and the isolation ones is given by the number of muscles involved in movement. The name of basic exercises is explained by the fact that these exercises are the basis of muscle mass development. They involve several muscle groups and joints. For example: squats, straight legged dead lifts, bar rows, barbell chest press. The name of isolation exercises is given by the ability of these exercises to isolate a specific muscle from contraction point of view. For example, if we make the flexion of the forearm on the arm with the barbell from seated position, besides the brachial biceps there will be contracted the brachial and brachio-radial muscles too, plus other muscles that act to stabilize the body and to allow a coordinated movement. However, if we make this exercise from seated position on "Scott" bench, most of the muscles that do not affect directly the movement will be relaxed, so we shall succeed to isolate the arm anterior muscles group (Damian, 2006).

Regarding nutrition during the intense workouts, many bodybuilders tend to lose muscle mass as they prepare for competition, probably due to protein diet. It takes an extra amount of protein to repair damaged muscle fibers after intense training. Among the potential mediators of recovery with additional intake of protein there is the diminution of muscle destruction markers and the facilitation of accelerated rate of glycogen replacement after exercise (Flakoll, et.al, 2004).

There is evidence that increased protein intake stimulates fat oxidation to a greater extent than other nutrients and that the metabolism and fat oxidation are accelerated after consumption of high amounts of protein during slimming diets with energy restriction (Labayen, Diez, Parra et al., 2004; Labayen, Diez, Gonzalez et al. 2003; Labayen, Diez, Parra et al. 2004). Moreover, the oxidation of fats induced by workouts is higher if protein intake is high (Soenen, Plasqui, Smeets, et al. 2010). Thus, the oxidation of fats increases the intake of protein, per se, and protein synthesis is supported by the extra energy. Also, a larger amount of energy will be required because the muscle mass is maintained along such a diet. A recent study has shown that diets with a high amount of proteins have the ability to maintain muscle mass during severe energy restriction for two weeks in the case of weightlifters (Mettler, Mitchell, Tipton, 2010).

For some persons, bodybuilding is just about lifting weights, for others it means using steroids, for others - a waste of time, for others it is a fad and the examples can continue. But for the serious athletes, committed body and soul to this sport, bodybuilding is hard work, done in a scientific manner, in other words, a pleasant lifestyle and beneficial for the body, after which you get a healthy and beautiful body. It is highly unlikely, if not impossible (normally if there are not other disorders) to exceed your genetic limitations and to grow 20-30cm in height or to reach 60cm of the arms if your parents are people of small stature and with thin bones. (*** 2011).

Methods

This scientific approach led to a study of case conducted within the Sports Club named „Tonik Fitness Club" of Bucharest, with two athletes aged 24 and 33 respectively, with 4 and 6 years experience in the field. The study was carried out during a period of 4 months (February - May 2012). Tests and control trials have been applied for assessing the development of muscle groups strength, in terms of anthropometric data and tests for pectoral strength, back and lower limbs strength. Two categories of exercises were used during workouts: basic and secondary (complementary).

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Fig. 1. Exercises for pectoral muscles

Fig. 2. Exercises for back muscles

Control tests and trials have been applied during the research:

1) Anthropometric measurements: Height, cm; Weight, kg; Thoracic perimeter, cm: expiration, inspiration and amplitude; Waist, cm: inspiration and expiration; Perimeter of arms, cm: right and left; Perimeter of thighs, cm: right and left; Perimeter of calves, cm: right and left.

2) Control tests:

- Pectoral strength, barbell horizontal bench press , assessed by a maximum rep (figure no. 1);
- Back strength, cable machine chest pull-downs with large grip, with 88kg, assessed by number of reps (figure no. 2);
- Lower limbs strength, back barbell squats with 100kg, assessed by maximum number of reps.

Workouts have been divided into two categories:

- *workouts with basic exercises* – the exercises that involve in their execution several muscle groups and that allow to use higher weights, specific to performance bodybuilding;
- *workouts with auxiliary exercises*, also called complementary ones –those exercises that do not allow the use of very large weights because of the isolation and that do not involve several muscle groups. The exercises isolate the muscle group with which we work and they are specific to fitness bodybuilding.

Results

Table no. 1. Results of anthropometric measurements

Full name	Weight, (kg)		Height, (cm)	Waist, cm			
				Inspiration		Expiration	
	Initial	Final		Initial	Final	Initial	Final
P.M.	72	74	166	78	76	85	84
F.C.	71.5	73	172	77	75	82	80
Statistical indicators							
X	71.75	73.5	169.0	77.5	75.5	83.5	82.0
Am	0.25	0.5	3.0	0.5	0.5	1.5	2.0
SD	0.25	0.5	3.0	0.5	0.5	1.5	2.0
Cv%	0.35	0.68	1.78	0.65	0.66	1.80	2.44

Note: X – mean, Am – average deviation; SD – Standard deviation; Cv- coefficient of variability

In table no. 1 are listed the results of anthropometric measurements in terms of weight, height and waist of the subjects of the study.

Table no. 2. Results of anthropometric measurements

	Full name	Thoracic perimeter (cm)						Arms perimeter (cm)			
		Inspiration		Expiration		Amplitude		Right		Left	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	P.M.	111	113	106	107	5	6	40	41.5	41.5	43
2	F.C.	107	108	102	103.5	6	5	40.5	41.5	40	41
Statistical indicators											
X		**109**	**110.5**	**104**	**105.2**	**5.5**	**5.5**	**40.25**	**41.25**	**40.5**	**42.0**
Am		2.0	2.5	2.0	1.75	0.5	0.5	0.25	0.25	0.5	1.0
SD		2.0	2.5	2.0	1.75	0.5	0.5	0.25	0.25	0.5	1.0
Cv%		1.83	2.26	1.92	1.66	9.09	9.09	0.62	0.61	1.23	2.38

Table no. 2 shows the thoracic perimeter in terms of inspiration, expiration and amplitude and the perimeter of left and right arms during initial and final tests.

Table no. 3. Results of anthropometric measurements - continuation

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No.	Full name	Perimeter of thighs (cm)				Perimeter of calves (cm)			
		Right		Left		Right		Left	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	P.M.	55	56	55	56	36	37	35.5	36,5
2	F.C.	53	54	53	54	34	35	34	35
Statistical indicators									
X		54.25	55.0	54.0	55.0	35.0	36.0	34.75	35.75
Am		0.75	1.0	1.0	1.0	1.0	1.0	0.75	0.75
SD		0.75	1.0	1.0	1.0	1.0	1.0	0.75	0.75
Cv%		1.38	1.82	1.85	1.82	2.86	2.78	2.16	2.10

Table no. 3 shows 3 the perimeter of thighs and the perimeter of calves at initial and final testing.

Table no. 4. Results of control tests

No.	Full name	Barbell horizontal bench press, max.1 rep.		Cable machine chest pull-downs, 88kg, reps no.		Barbell squats, 100kg, reps no.	
		Initial	Final	Initial	Final	Initial	Final
1	P.M.	115	120	8	12	8	12
2	F.C.	95	100	6	8	5	8
Statistical indicators							
X		105.2	110	7.0	10.0	6.5	10.0
Am		9.75	10.0	1.0	2.0	1.5	2.0
SD		9.75	10.0	1.0	2.0	1.5	2.0
Cv%		9.26	9.09	14.29	20.0	23.08	20.0

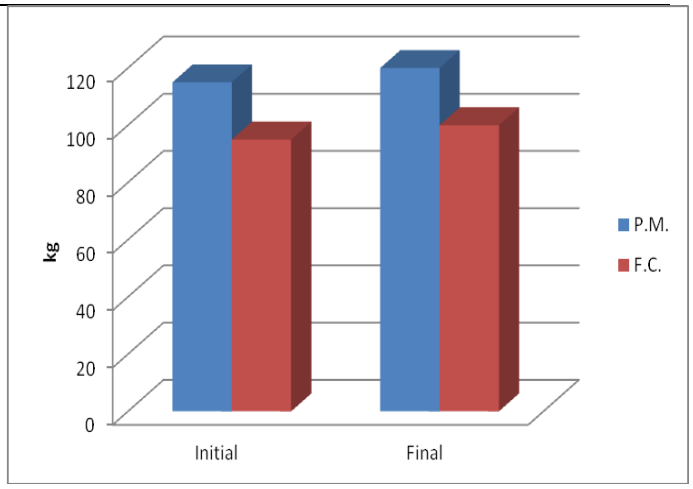

Fig. no. 1. Barbell horizontal bench press

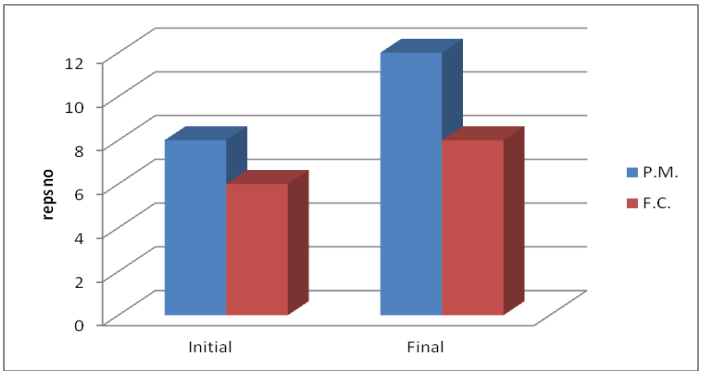

Fig. no.2. Cable machine chest pull-downs, weight 88kg

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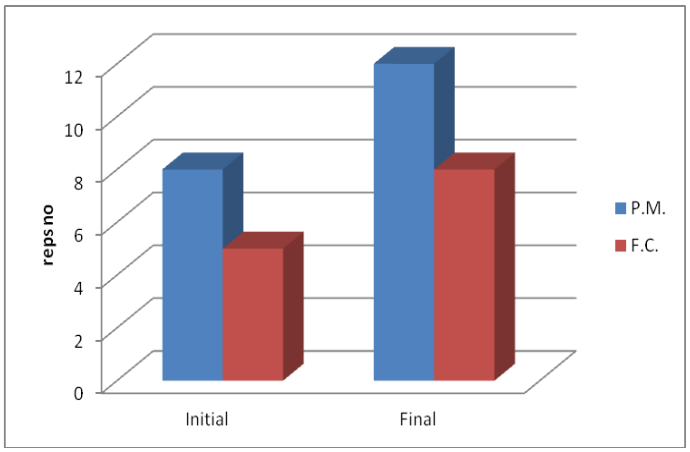

Fig. no. 3. Back barbell squats, weight 100kg

Table no. 4 highlights the results of control trials regarding the pectoral strength assessed by barbell horizontal bench press (fig. no.1), maximum 1 rep; strength of the back assessed by cable machine chest pull-downs with 88kg (fig.2) and strength of lower limbs assessed by squats with 100kg – maximum number of reps (fig.3).

Discussions

In the present study this is confirmed by a significant positive relationship between development in all strength parameters and serum testosterone concentration. This relationship is dependent on anatomic dimensions and skinfold thickness, indicating that these factors also play a role in the development of strength (Klausen, K, 1990).

Muscular strength increases more or less linearly with age from early childhood in boys. Strength is known to be related to the physiological cross-sectional area of the muscle and hence, according to a dimensional analysis, related to the second power of body height. During growth the cross-sectional area would then be expected to increase, with the square of the increase in the linear dimension (Hansen, L., J. Bangsbo, J. Twisk, and K. Klausen, 2013).

Regarding the results of anthropometric measurements, we notice a mean of 71.75kg at initial testing and an increase by 1.79kg at final testing; the height has a mean of 169 cm while the waist has a mean of 77.5cm at initial testing and a decrease by 2.2cm at final testing at inspiration and a mean of 83.5cm at initial testing and a decrease by 1.5cm at final testing at expiration (table no. 1).

In terms of thoracic perimeter, one can observe that the inspiration has a mean of 109 cm at initial testing and an increase by 1.5cm at final testing; at expiration, the mean is 104cm at initial testing and an increase by 1.2cm at final testing; the thoracic amplitude has a mean of 5.5cm at initial and final testing. As for the arms perimeter, we notice that in the case of right arm the mean is 40.25cm at initial testing with an increase of 1.0cm at final testing; for the left arm, the mean is 40.5cm at initial testing with an increase of 0.5cm at final testing (table no. 2).

Regarding the results of thighs perimeter, we notice a mean of 54.25cm at initial testing with an increase of 0.75cm at final testing in the case of the right thigh and a mean of 54 cm at initial testing with an increase of 1.0cm at final testing in the case of the left thigh; as for the perimeter of calves, it has a mean of 35cm at initial testing and an increase of 1.0 cm at final testing for the right calf and a mean of 34.75cm at initial testing and an increase of 1.0cm at final testing for the left calf (table no. 3).

In terms of results of the control tests, in the case of pectoral muscles strength it is highlighted a mean of 105.2kg for performing 1 maximum repetition of barbell horizontal bench press and an increase of 4.8kg – at final testing; in the case of back muscles strength, we notice a mean of 7 reps for cable machine chest pull-downs with a weight of 88kg and an increase by 3 reps in final testing executed with the same weight; regarding the lower limbs strength, there is a mean of 6.5 reps at initial testing with a weight of 100kg and an increase of 3.5 reps at final testing executed with the same weight (table no. 5).

Conclusions

Improving and streamlining of bodybuilding training is done by individualizing the workouts, by experimenting new exercises, new training methods and programs.

Bodybuilding aims at the maximum use of all possibilities of each individual's muscular development. These possibilities vary from practitioner to practitioner; the bodybuilding places at the disposal of the enthusiasts many types and variants of exercises and from their range can be selected the exercises that are considered more useful and necessary.

In bodybuilding, the results depend on the bone structure, on the metabolism, on the way the body

reacts to stress, on the recovery ability, so on the individual characteristics. Therefore in this discipline more than in any other sports discipline, the training "recipes" are unfounded and invalid. Subsequently, the individual creation of training program is the only correct way of elaboration and organization of training process.

Study results show the changes of anthropometric measurements, namely: an increase of thoracic perimeter, of arms perimeter, of thighs and calves perimeters according to the weight increase and last, but not least, to muscle mass increase. This demonstrates the effectiveness of using basic and complementary exercises for the development of main muscle groups during workouts, showing the results of the control trials regarding pectoral muscles, back muscles and lower limbs muscles.

In the end of the paper we can draw the conclusion that the review of the theoretical materials and practical activities emphasize the fact that the use of both basic and complementary exercises contribute to a more efficient development of main muscle groups during workouts.

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SHARE OF TECHNICAL TRAINING IN THE PRE-COMPETITIVE PERIOD OF PERFORMANCE WEIGHTLIFTING

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Abstract

The purpose of this paper is to highlight the share of technical training means throughout the preparatory period, pre-competitive stage, in performance weightlifting.

Methods and procedures. This scientific approach has led to a study conducted in Sports Club „Olimpia" of Bucharest, along a period of 9 micro-cycles (12.III – 12.V.2012), with the performance target to participate in the National Championships for Seniors – qualifications. In this research we used the method of bibliographic study, method of pedagogic observation, method of experimental study, statistical-mathematical method (KyPlot) and graphical representation method (Excel). In order to highlight the share of technical training means, we analyzed the training programs of the pre-competitive stage, monitoring statistically the development of planning and performance parameters.

Results. The highlighting of the share of technical training means during the pre-competitive stage focused on the details of means planning content per each training micro-cycle in terms of number of reps, relation of specific means of technical training and strength within the training micro-cycles and the dynamics of effort parameters in each micro-cycle as well.

*Conclusions.*The share of effort parameters during the pre-competitive mezzo-cycle points out the number and the reps per each training micro-cycle, the relation of technical training and strength means assigned for the snatch style and the clean and jerk style, plus workouts for squats and back.

The study results reveal that ensuring an optimum relationship between the specific means of technical training and strength and the effort parameters in the pre-competitive stage leads to the improvement of execution technique in accordance with the development level of muscle strength of lower limbs and back, fact that confirms the hypothesis proposed by the results achieved in competition.

*Key words***:** weightlifting, technical training, planning, performance.

Introduction

One of the main problems in performance weightlifting refers to the gradual training of athletes for the execution of competition exercises in snatch style and clean & jerk style with a certain weight of the barbell, when athlete's body condition must be maximal. The factor that ensures optimum conditions for solving these problems is the rational sports technique (without violating competition rules) that helps the athlete to use efficiently the possibilities of the physical functional and psychological traits when he lifts a barbell with maximum weight (Dvorkin, 2005).

Physical training is one of the most important factors and in some cases, the most important ingredient of sports training in achieving great performance. The main objectives of physical training are to increase the athlete's physiological potential and to develop biometrical skills at the highest level (Bompa, 2002).

Specific physical training content is mostly oriented towards the development of the capacity for effort specific to a sports branch and of the motor skills involved, combined in a priority and differentiated manner, leading - ultimately – to specific efficiency. In some branches of sports the performance is strictly determined by the development of motor skills (in weightlifting - the strength, in rowing - the endurance) or by a complex of motor skills (in the case of sports games, combat sports, etc.) (Dragnea, 1996). Skilful use of strength exercises help restore the capacity for effort, alternating the muscle groups less engaged with the ones fully stressed, conditioning the effectiveness of training (Nicu, 1993).

Learning the technique of various branches of sport is generally characterized by the laws and acts and stages of the motor acts and actions, of course, with some differential specific notes, determined by the particularities of sport branches. (Dragnea, 1996). Relationships between technical components and technical styles are not present in all branches of sport, some of them have only technical styles (weightlifting) (Dragnea, Mate-Teodorescu, 2002).

The analysis of weightlifters' long-term training, at

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different levels of sports training, allows the discovery and study of individual characteristics. The data of the pedagogical control are basic for making decisions in terms of organization of athlete's training process. Thanks to their application, the prognostication of sports results improvement becomes more precise, there are highlighted the best models for the specific physical training, the elaboration of the transition stage of athlete's body, models that serve as checkpoints in the achievement of the main objectives. The effectiveness of coach's activity for the development of the training program increases significantly. This fact is manifested in the election of training cycles structure, physical exercises, their use in training sessions and the determination of the load (Marchenko; Dvorkin; Rogozjan, 1998).

The creation of the training process within mezzo-cycles raises topical questions in the specific strength training of the athletes. In the previous studies, the authors focused on some methodological approaches on the use of the mezzo-cycles oriented towards strength development. Special interest of the authors was directed to the characteristics of strength training throughout a longer period of preparation. The review of specialized literature has allowed establishing the fact that this part of sports theory and practice has been the subject of special attention from the specialists of the field. The determined objectives, the structure and contents of mezzo-cycles indicate the place of each one in various stages of the training (Bojko,1987; Verhoshanskij, 1985; Marchenko, Rogozjan, 1995; Matveev, 1991).

Weightlifters training is built in the form of training cycles, aimed at achieving high sports results at some point of time. Each training cycle is formed of periods meant to develop the specific fitness, to stabilize it and to lose it temporarily. These periods of the training are called preparatory, competitive and transitional periods. All together, these three periods form the training cycle or, by its other name, the big cycle (macro-cycle) (Roman, 1986).

One of the basic conditions in planning the weights for training is variety. The gradual increase of weights volume can be made only in classes of beginners and children, also in the case of the athletes ranked after the transition period, when a new annual training cycle (Roman, 1986).

The organization of training on the basis of mezzo-cycles allows systematic training in accordance with the main objective of the preparation period and stage; it makes possible an optimum dynamics of loads, the combination of different means and methods of training between the factors of pedagogical impact and the recovery activities. The number and structure of the competitive mezzo-cycles in athletes' training highlight the specific character of sports branch, the features of the competition calendar, the degree and level of the training for qualification. The combinations and total load of the micro-cycles that form mezzo-cycles depend often on the multi-annual training stage (Platonov, 2004).

In order to find correctly the main result in the strength workouts of the next mezzo-cycle, one must give necessarily the objective score for the special training level achieved by the athlete. It is very important to know the characteristics of the recovery indicators in various exercises. During this stage are made the decisions on the adaptation capacities of the athlete and his qualification, in accordance with the results obtained by choosing the means that have the best results presented earlier (Marchenko, Dvorkin, Rogozjan, Rudenko, 1997).

Effort parameters show the increase of effort parameters from one micro-cycle to another by increasing the loads, the number of series and reps; the progressive increase of effort parameters, maintaining their maximum level; diminution of volume before competitive period; dynamics of effort parameters as for the relationship between technical and physical training (Potop, 2010).

The fundamental structure of training sessions is based on certain physiological, psychological and pedagogical principles. The duration of the training sessions is outlined by the optimization of the training factors and depends on the specific character of the sports branch and on athlete's individual capacities. Three structural levels can be identified in the training process: microstructure – structure of separate workouts and micro-cycles; mezzo-structure- structure of medium cycles and the training stages, including a series of different types of micro-cycles; macro-structure – structure of large cycles (macro-cycle) (Dvorkin, 2005).

The means of training or lesson consist of the physical exercises assembly that ensures transformations and improvements of different performance factors. The specific means have an increasing share in the macro-cycles, meaning that their presence is reduced in the first micro-cycles, then they are more and more often repeated in proportion as the middle of the pre-competitive period gets closer. During the competitive period, the specific means are diminished, leaving the main place to the means of competitive nature. (Dragnea, Teodorescu, 2002).

The purpose of this paper is to highlight the share of technical training means throughout the preparatory period, pre-competitive stage, in performance weightlifting.

Methods

Hypothesis of the paper. We consider that an optimum relationship between the specific training means for technique and strength and the effort parameters in competitive period will lead to the improvement of execution technique, in conformity with the development level of muscle strength of the lower limbs and of the back.

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This scientific approach has led to a study conducted in Sports Club „Olimpia" of Bucharest, along a period of 9 micro-cycles (12.III – 12.V.2012), with the performance target to participate in the National Championships for Seniors – qualifications. In this research we used the method of bibliographic study, method of pedagogic observation, method of experimental study, statistical-mathematical method (KyPlot) and graphical representation method (Excel). In order to highlight the share of technical training means, we analyzed the training programs of the pre-competitive stage, monitoring statistically the development of planning and performance parameters.

Results

Table no. 1. Share of the number of reps in pre-competitive stage (2012)

Mc No.	Date	No of reps	Technique / strength %	Snatch / Clean&Jerk %	Squats / Back Ex. %	Chest squats / Back squats %	Pulls / bending %
1	19-24.III	600	30 / 70	40/ 60	60 / 40	55 / 45	70 / 30
2	26-31.III	500	30 / 70	40 / 60	60 / 40	50 / 50	70 /30
3	2-7.IV	600	30 / 70	45 / 55	55 /45	40 / 60	60 /40
4	9-14.IV	500	30 / 70	45 / 55	55 / 45	45 / 55	65 /35
5	16- 21.IV	600	30 / 70	50 / 50	50 / 50	40 / 60	60 /40
6	23- 28.IV	500	30 / 70	50 /50	55 / 45	45/55	65/35
7	30.IV- 5.V	600	30 / 70	45/55	60/40	50 /50	60/ 40
8	7- 12.V	500	30 / 70	45 /55	65/ 35	45/ 55	60 /40
9	14- 19.V	400	30 / 70	50 / 50	60 / 40	45 / 55	65 /35

Table no. 1 shows the share of the number of reps in the pre-competitive stage of training of the junior weightlifters subjects of the study, in terms of number of micro-cycles, period of training conduct, total number of reps per each micro-cycle, share and number of reps of the technical and strength training.

Table no. 2. Relationship of the number of reps of the technical and strength training means in pre-competitive period.

MiC No.	Reps no.	Technique / strength %		Reps	
1	600	30	70	180	420
2	500	30	70	150	350
3	600	30	70	180	420
4	500	30	70	150	350
5	600	30	70	180	420
6	500	30	70	150	350
7	600	30	70	180	420
8	500	30	70	150	350
9	400	30	70	120	280
Mean	**533.33**			**160.00**	**373.33**
SEM	23.57			7.07	16.49
SD	70.71			21.21	49.49
Cv%	13.25			13.25	13.25
Sum	4800			1440	3360

Note: MiC no.– number of micro-cycle, SEM – standard errors deviation, SD – standard deviation, Cv – coefficient of variability.

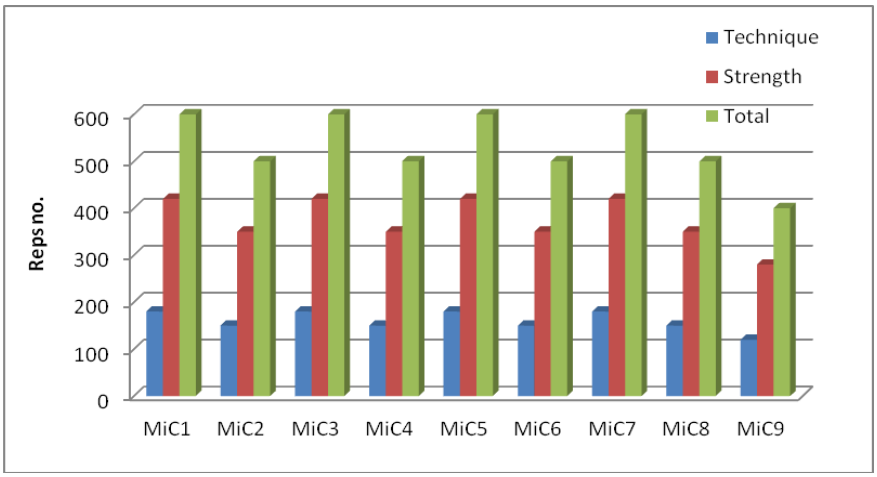

Fig.no. 1. Dynamics of reps number of technical and strength training means in pre-competitive stage

Table no. 2 and figure no. 1 show the relationship and the dynamics of technical and strength training means in the pre-competitive period of junior weightlifters.

Table no. 3. Distribution of reps number for strength training in pre-competitive stage

MiC	Reps no.	Squats (reps no.)			Back exercises (reps no.)			
		Total	Front barbell	Back barbell	Total	Pulls snatch	Pulls clean&jerk	Bending
MiC1	420	252	138	114	168	50	66	52
MiC2	350	210	105	105	140	40	58	42
MiC3	420	231	92	139	189	50	62	77
MiC4	350	192	87	105	158	45	57	56
MiC5	420	210	95	115	210	55	71	84
MiC6	350	182	82	100	168	52	60	56
MiC7	420	252	126	126	168	46	56	67
MiC8	350	227	102	125	123	32	42	49
MiC9	280	168	75	93	112	30	42	40
Mean	**373.33**	**213.78**	**100.22**	**113.56**	**159.56**	**44.44**	**57.11**	**58.11**
SEM	16.49	9.86	6.83	4.84	10.27	2.92	3.26	5.03
SD	49.49	29.58	20.48	14.52	30.84	8.77	9.76	15.09
Cv%	13.25	13.83	20.43	12.79	19.75	17.09	17.09	25.97
Sum	3360	1924	902	1022	1436	400	514	523

Fig. no. 2. Number of reps of strength exercises in pre-competitive stage

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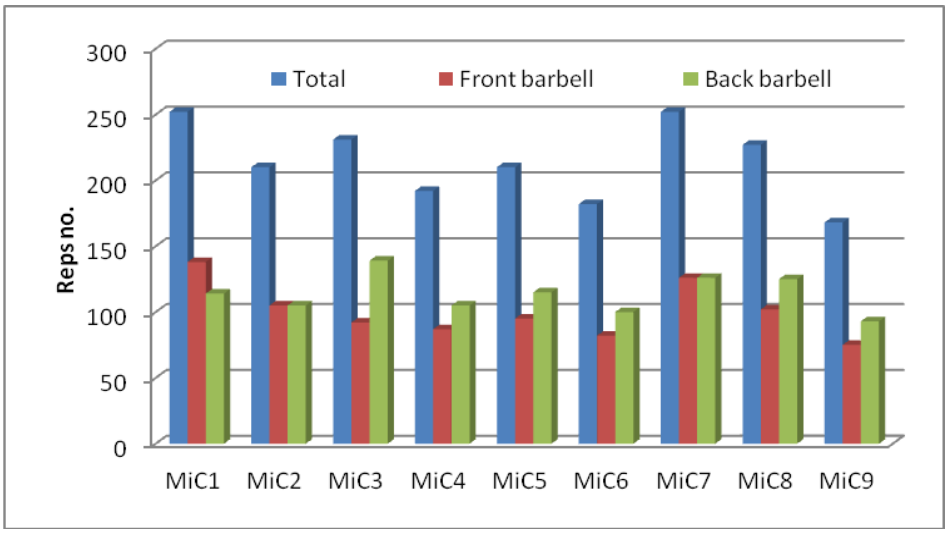

Fig. no. 3. Number of reps of squats exercises in pre-competitive stage

Table no. 2 and figures 2, 3 and 4 show the distribution of reps number of the means for strength training in pre-competitive stage in terms of number of micro-cycles, number of reps of front and back squats, exercises for back in snatch style and in clean and jerk style; there are also listed the results of the statistical indicators of the means for strength training.

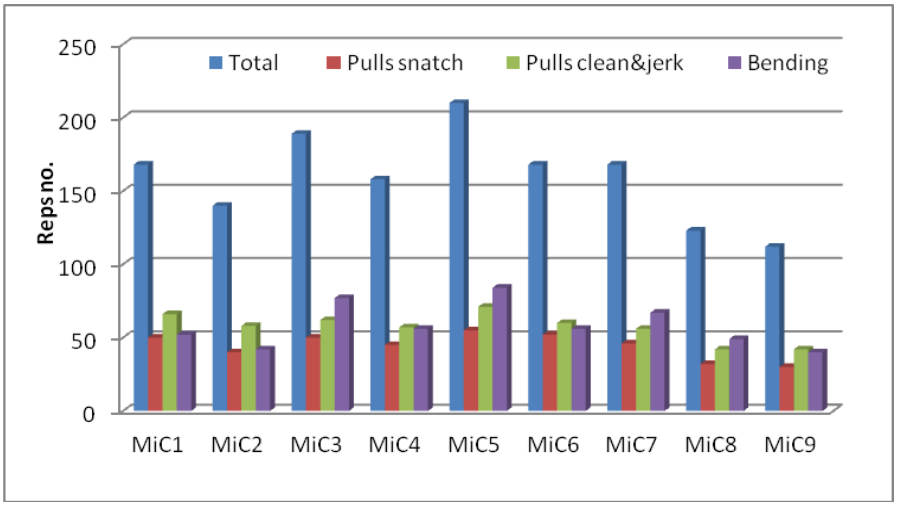

Fig.no. 4. Number of reps of back exercises in pre-competitive stage

Table no. 3. Distribution of reps number for technical training in pre-competitive stage

MiC	No. of total reps	Snatch style, (reps no.)	Clean & Jerk style (reps no.)
MiC1	180	72	108
MiC2	150	60	90
MiC3	180	81	99
MiC4	150	68	82
MiC5	180	90	90
MiC6	150	75	75
MiC7	180	81	99
MiC8	150	68	82
MiC9	120	60	60
Mean	**160.00**	**72.78**	**87.22**
SEM	7.07	3.35	4.81
SD	21.21	10.05	14.44

Cv%	13.25	13.82	16.56
Sum	1440	655	785

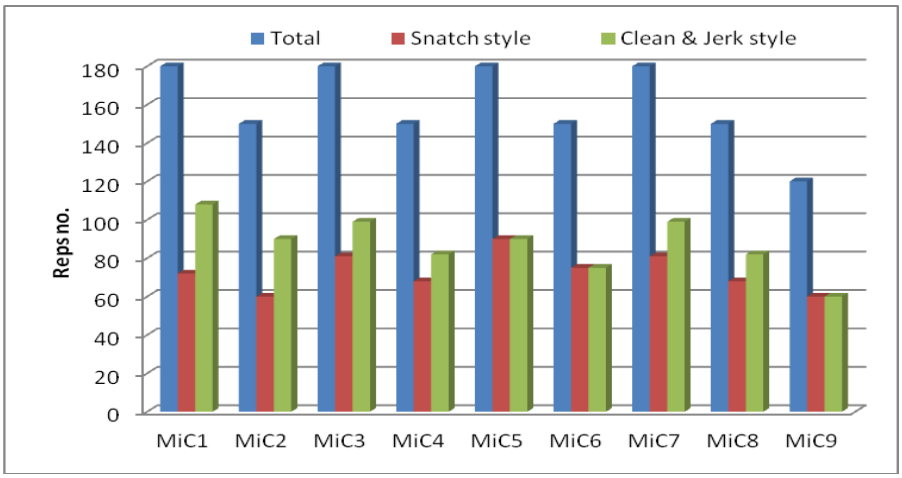

Fig.no. 5. Number of reps for technical training in pre-competitive stage

Table no. 3 and figure no. 5 show the distribution of reps number for technical training in pre-competitive stage in terms of micro-cycle number, total number of reps and statistical indicators of these ones.

Table no. 4. Results of competitive performances - N.C. for Seniors

Full name	Class (kg)	Weight in competition	Snatch	Clean and jerk	Total	Ranking Sn.	Ranking C&J	Ranking T.
V.V.	56	55.80	95	112	207	2	1	1
P.N.	62	61.70	101	126	227	5	3	5
R.R.	85	79.80	120	146	266	3	3	3
D.R	94	92.95	120	145	265	2	2	2
Mean		**72.56**	**109**	**132.25**	**241.25**			
SEM		8.50	6.47	8.17	14.58			
SD		17.00	12.93	16.34	29.17			
Cv%		23.43	11.87	12.35	12.09			

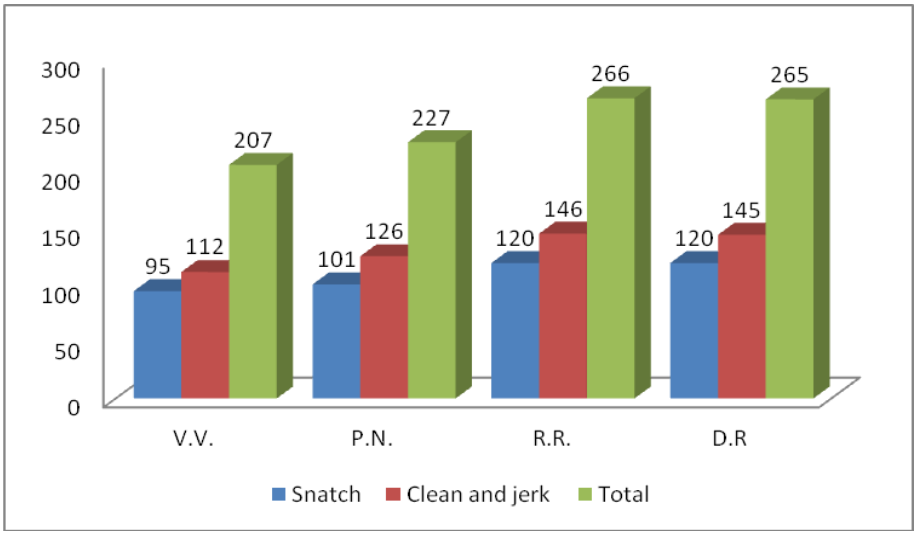

Fig.6. Results of competitive performances - N.C. for Seniors

In table no. 4 and figure no. 6 are listed the results achieved in competition during the National Championship for seniors regarding the competition classes, weight in competition, performances achieved in competition at snatch style, clean and jerk style and total of styles.

Discussions

The Bulgarian training approach is unique in that it does not deal with percentages of maximum or expected maximum lifts, a procedure common to weightlifting training for at least the last four decades (Abadjiev, I. 1989). The Soviet-derived system may be even more diversified than it appears to be on the surface due to the aforementioned geopolitical factors. The widely dispersed elite-level coaches tended to develop and emphasize the successes of their own training methods, albeit within fairly narrow limits. This situation may lead to more variation in training programme design, especially when considering the lack of prolonged strong leadership that Bulgaria has enjoyed under former national coach Ivan Abadjiev (Paavo V. Komi, 2003)

Two or more complete cycles (preparatory + competition) may fit into a training year. Stone *et al*. (1981) have proposed and successfully tested a periodized model of strength–power training with sequential phases that change rather drastically. For example, a phase to increase muscle size (5 sets of 10 repetitions in squat and pulling exercises), a phase to improve basic strength (3–5 sets of 5 repetitions), a phase to improve speed–strength (3–5 sets of 3 repetitions), and a phase to 'peak' for competition (1–3 sets of 1–3 repetitions). The use of 10 repetitions per set is higher than typically recommended in the early preparation phase but has proved to be successful in a number of studies (e.g. Stone *et al*. 1982).

Regarding the share of reps number in pre-competitive stage, we notice: 9 training micro-cycles, a total number of 4800 reps per stage with a mean of 533.33 reps, a relationship of 30 / 70% of the share of technical and strength training means, with a total number of 1440 reps and an average of 160 reps per stage at technical training and a total amount of 3360 reps and an average of 373.33 reps per stage at strength means.

As for the distribution of reps number during the strength training, we notice a total amount of 1924 reps for squats exercises divided as follows: 902 front barbell squats and 1022 back barbell squats. In the case of back exercises, the total number of reps is 1436 divided into 400 reps pulls exercises for snatch style, 514 reps for jerk pulls and 523 reps for bending.

Concerning the distribution of technical training means in pre-competitive period, we notice a total number of 1440 reps and an average of 160 reps per stage, divided as follows: at snatch style - a total of 655 reps and 785 reps at clean and jerk style.

In terms of effort parameters planning throughout the training macro-cycle for the National Championships for seniors, one can highlight that the athletes-subjects of the research have an average weight in competition of 72.56 kg, a mean of the performances in snatch style of 109kg, 132.25kg in clean and jerk and a total of 241.25kg. These results led to the ranking on 1st, 2nd, 3rd and 5th places at the total of the two styles.

Conclusions

We highlighted the number of reps during pre-competitive stage by providing a ratio of 30/70 % of the technical and strength training means, expressed by the total number of reps and their average throughout training period.

We pointed out the distribution of reps number by dividing the strength exercises by front barbell squats and exercises for the back divided into pulls exercises for snatch style and for clean and jerk style and bending exercises.

The share of effort parameters during the pre-competitive mezzo-cycle points out the number and the reps per each training micro-cycle, the relation of technical training and strength means assigned for the snatch style and the clean and jerk style, plus workouts for squats and back.

The study results reveal that ensuring an optimum relationship between the specific means of technical training and strength and the effort parameters in the pre-competitive stage leads to the improvement of execution technique in accordance with the development level of muscle strength of lower limbs and back, fact that confirms the hypothesis proposed by the results achieved in competition.

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BIOMECHANICAL CHARACTERISTICS OF MOVEMENT PHASES OF SNATCH STYLE IN PERFORMACE WEIGHTLIFTING

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Abstract

The purpose of this paper is to highlight the kinematic and dynamic characteristics of movement phases of snatch style in performance weightlifting.

Methods and procedures. This scientific approach has led to a study conducted during the European Junior Weightlifting Championships, Bucharest, 2011, with a group of 7 athletes, finalists of 56 kg class. The methodology of research focused on video recording, conversion of video capture into AVI format and the video biomechanical analysis of weightlifters' performances by means of a specialized program named Physical ToolKit.

Results. Each execution has shown the trajectories of the main joints involved in movement, highlighting the kinematic and dynamic characteristics of snatch style phases. The comparative analysis of the biomechanical indicators of movement phases in terms of beginning, extension, scoop, dip-under, catch and squat emphasize the duration of phases, the execution speed and the force to overcome the resistance of the barbell.

Conclusions. The study results revealed the kinematic and dynamic characteristics of movement phases of the snatch style, especially the snatch, phases that had an influence on the performances achieved in competition.

Key words: biomechanics**,** weightlifting, performance, snatch style, technique.

Introduction

The increase of performances in weightlifting, a phenomenon that we are continuously witnessing, is based on the improvement of technique and training methods. The modernization of training and competition materials and equipment (stage, platform, podium, barbells, arbitration and display equipment, computerized programs for conducting competitions) imposed the emancipation and selection of lifting styles, of arbitration rules and resulted in increased performance and spectacular events (***, 2009).

Athletes' training is carried out in an oriented, planned, systematic and long-term way, aiming to achieve performance. The changes during workouts cover both the component *performance*, as a result, and the structural component. The transformation in terms of performance refers to the mainly quantitative improvement of athlete's performance individual potential, which occurs usually in competition (Ulăreanu, 2012).

Sports training contents includes those structure elements based on the methodological laws and rules that help to achieve sports performance, physical exercises structured and diversified according to various specific rules (biomechanical, pedagogical, psychological, etc.) that represent the key elements of modern sports training contents (Simion, Mihăilă, Stănculescu, 2011, p.123).

In recent decades, the kinesiology discipline imposed conceptually as a scientific discipline that studies tha body activity in all its complexity, in many fundamental ways: philosophical, psychological, pedagogical, biophysical (physiological, biomechanical), hygienic (Hoffman & Harris (2000), quoted by Epuran,

The electronic development provided largely the

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objectification of sports training and competitions. Watching repeatedly, dozens of times, a freeze-frame of a loop-film or showing the images at normal speed can largely contribute to understanding some parts of the global execution of a technical procedure. Obviously, the specific character of each sports event or branch is given by the structure of technical elements, number, complexity, spectacular aspect, originality, frequency and efficiency in competition. The following biomechanical methods of research can be identified in the training field (Nicu, 1993):

a) *cinematographic method* – it is based on recording athlete's motor actions by means of high-speed filming equipment.

b) *method of stereography* – it makes possible the recording of sports technique using two infrared capture video cameras. The measurements are performed completely automatically; this method is extremely accurate and laborious (measurements can be bi- and tri-dimensional).

c) *method of dynamography* – it allows the registration of the changes in force intensity by means of tension control device (tenso-platform), of a tracking device (tensotractor) and of some telemetric sensors especially adapted to athlete's equipment.

d) *method of static-kinesimetry* (stabilometry) - it helps to determine the ability of maintaining the balance under various conditions (after effort, at a change of temperature, after vibrations, etc.).

e) *method of accelography* – it ensures the recording of intensity modifications of the accelerations of the real points of athlete's loco-motor system.

f) *method of electromyography* – it is based on the recording of the bio-currents in the muscles that are performing a mechanical work.

g) *method of goniography* – by means of special sensors attached to body joint projection, it allows the recording of the variations of the angle between two points of athlete's body during his movements.

The review of specialized literature has allowed establishing that this part of sports practice and theory has been the subject of special attention from the experts of this field. The objectives established, the structure and contents of mezzo-cycles indicate the place of each one in various stages of preparation (Bojko,1987; Verhoshanskij, 1985; Marchenko, Rogozjan, 1995; Matveev, 1991).

Learning the techniques used in various sport branches is generally characterized by the laws and phases of motor skills and actions, of course, with some differentiating, specific notes, determined by the particularities of sport branches. (Dragnea, 1996). The relations between technical elements and technical procedures are not present in all branches of sport, some of them having technical procedures only (weightlifting) (Dragnea, Mate-Teodorescu, 2002).

One of the major problems in performance weightlifting refers to the gradual training of the athletes for the execution of competition exercises in snatch and clean & jerk styles with a certain weight of the barbell, when athlete's body condition must be maximal. The factor that ensures the optimal conditions for the solution of these problems is the reasonable sports technique (without violating the competition rules), by which the athlete uses efficiently his physical, functional and psychological traits possibilities for lifting a barbell of maximal weight (Dvorkin, 2005).

The purpose of this paper is to highlight the kinematic and dynamic characteristics of movement phases of snatch style in performance weightlifting.

Methods

Hypothesis of the paper. We consider that the biomechanical video analysis will reveal the kinematic and dynamic characteristics of movement phases in snatch style, especially the flipping phase. Â

This scientific approach has led to a study conducted in the European Weightlifting Championship for juniors, Bucharest, 2011, on a group of 7 athletes, finalists of 56 kg class. We used the following research methods during the study: method of bibliographic study, observation method, video computerized method, method of experimental study and method of graphical representation. The methodology of research focused on video recording, transformation of video capture in AVI format (Pinnacle studio 9) and biomechanical video analysis of weightlifters' executions by means of a specialized program named Physical ToolKit, where every successful movement has been divided in 24 sequences every 4 frames (for example: 0.767 sec. x 4 frames = 3.068 sec).

Results

The findings of the study have been automatically processed by the biomechanical analysis program called Physical ToolKit. In order to highlight the kinematic and dynamic features of the athletes-subjects of the study in snatch style, we shall introduce the first three athletes honored in the European Championship for juniors, Bucharest, 2011.

Table no. 1. Results of biomechanical indicators in snatch style, 118kg weight, 56kg class, (CFI)

Time,	Movement	Position (m)		Velocity (m/s)			Force (N)		
sec	phases	X	Y	V_x	V_y	V	F_x	F_y	F
0.000	SP	-0.017	0.166						
0.033		-0.0552	0.188	0.00	1.004	1.004			
0.067		-0.017	0.232	-0.335	1.841	1.871	-354.606	1770	1810

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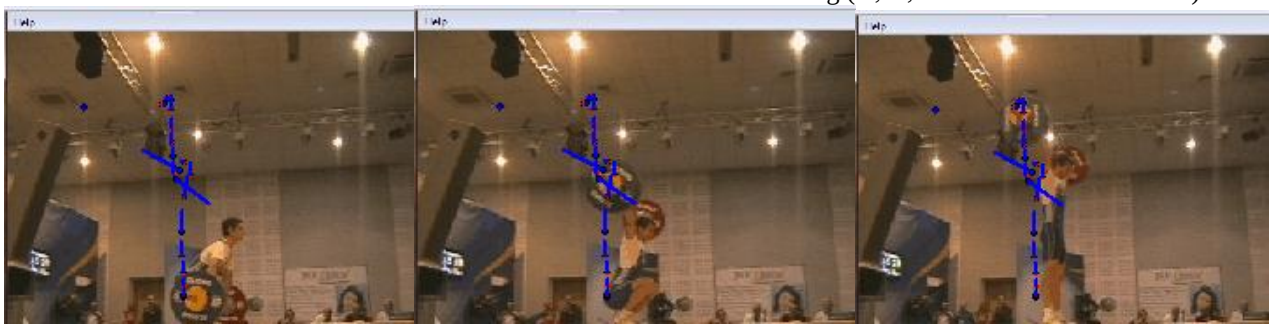
0.1	Straightening	-0.028	0.309	-0.418	3.095	3.124	212.763	1770	1790
0.133		-0.044	0.436	-0.084	3.932	3.124	851.053	1770	1970
0.167	Flipping	-0.033	0.569	0.586	5.187	5.22	709.21	1280	1460
0.2		-0.0552	0.779	0.753	5.438	5.49	-567.367	-1700	1790
0.233		0.017	0.928	-0.084	3.179	3.18	-1210	-3970	4150
0.267		-0.011	0.988	-0.669	0.753	1.007	-780.132	-3260	3350
0.3		-0.028	0.977	-1.004	-0.669	1.207	-212.763	-1350	1360
0.333		-0.077	0.944	-0.92	-0.837	1.244	496.447	709.209	865.7
0.367	Getting	-0.088	0.922	-0.418	0.167	0.451	567.369	1700	1790
0.4	under	-0.105	0.955	-0.251	1.171	1.198	283.685	1350	1380
0.433	barbell	-0.105	0.999	-0.084	1.757	1.759	70.922	709.21	712.747
0.467		-0.11	1.071	-0.167	2.008	2.015	70.921	354.606	361.628
0.5		-0.116	1.132	0.00	2.175	2.175	212.762	921.973	946.204
0.533		-0.11	1.215	0.084	3.095	3.097	-70.921	638.29	642.217
0.567		-0.11	1.132	-0.084	2.928	2.929	-283.684	-1840	1870
0.6		-0.116	1.408	-0.251	0.92	0.954	-212.765	-2840	2840
0.633		-0.127	1.397	-0.335	-0.418	0.536	70.921	-1210	1210
0.667	Catch	-0.138	1.38	-0.167	-0.502	0.529	283.685	212.763	354.606
0.7		-0.138	1.364	0.00	-0.167	0.167	-70.921	496.447	501.487
0.733		-0.138	1.369						
0.767		-0.155	1.369						

Note: *Phases of movement:* **SP** –Start position [0.00 sec.], Straightening [0.033-0.133sec.]; Flipping [0.167-0.2]; Getting under the barbell [0.233-0.4]; Lifting and catching the barbell [0.433-0.767].

Table no. 1, figures 1 and 2 shows the biomechanical indicators in the snatch style performed by the Romanian athlete whose name is CFI, with competition weight of 55.95kg, at the performance of 118kg. There are highlighted: duration of movement divided into 5 phases of the movement, bar trajectory (X, Y); velocity and force of barbell lifting (X, Y, R- resultant of these ones).

In table no. 1, figures 1 and 2, there are shown the biomechanical indicators in snatch style achieved by the Romanian athlete CFI, with competition weight of 55.95kg, at the performance of 118kg. We can see: duration of movement divided into 5 phases of the movement, bar trajectory (X, Y); velocity and force of barbell lifting (X, Y, R- resultant of these ones).



a) **b)** **c)**

Figure no. 1. Start position (a), getting under barbells (b) barbell catching in snatch style (c) athlete - CFI

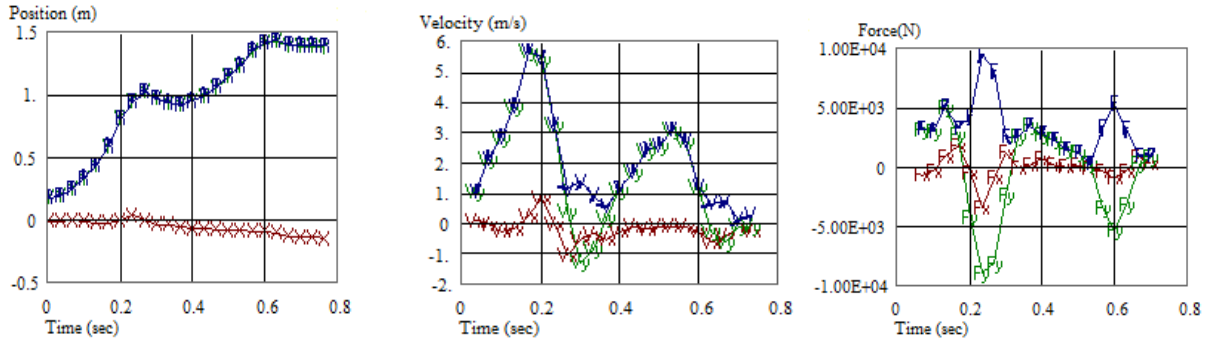


Figure no. 2. Trajectory of barbell, velocity and force of barbell lifting in snatch style (CFI)

Table no. 2. Results of biomechanical indicators in snatch style, weight 117kg, class 56kg, (CS)

Time,	Movement	Position (m)		Velocity (m/s)			Force (N)		
sec	phases	X	Y	V_x	V_y	V	F_x	F_y	F
0.000	SP	-0.0055	0.183						
0.033		-0.0055	0.189	0.00	0.454	0.454			

0.067		-0.011	0.189	-0.076	0.757	0.76	-192.322	897.501	917.876
0.1	Straightening	-0.022	0.272	-0.227	1.513	1.53	-192.322	1150	1170
0.133		-0.044	0.367	-0.303	2.119	2.14	64.106	512.858	516.849
0.167	Flipping	-0.056	0.444	-0.151	2.119	2.124	-192.322	1600	1610
0.2		-0.067	0.566	-0.53	4.01	4.045	-512.857	2370	2430
0.233		-0.061	0.761	-0.757	4.918	4.976	-192.322	-897.502	917.877
0.267		-0.067	0.883	-0.757	2.951	3.046	-320.537	-4170	4180
0.3		-0.094	0.944	-1.135	0.00	1.135	-384.644	-4100	4120
0.333		-0.155	0.894	-1.211	-1.892	2.246	384.645	-1150	1220
0.367	Getting	-0.183	0.816	-0.681	-1.362	1.523	769.287	1540	1720
0.4	under	-0.205	0.789	-0.303	-0.076	0.312	256.428	1540	1560
0.433	barbell	-0.217	0.772	-0.378	0.454	0.591	128.215	384.645	405.451
0.467		-0.233	0.8	-0.151	0.378	0.407	320.536	448.752	551.472
0.5		-0.244	0.827	0.00	0.984	0.984	64.106	897.501	899.787
0.533		-0.244	0.877	-0.076	1.438	1.44	-192.322	448.75	488.226
0.567		-0.261	0.922	-0.227	1.513	1.53	-128.214	256.428	286.696
0.6		-0.261	0.977	-0.227	1.74	1.755	128.215	64.108	143.349
0.633		-0.272	1.038	-0.076	1.589	1.591	128.214	-448.749	466.706
0.667	Catch	-0.289	1.1	-0.076	1.211	1.213	64.107	-448.753	453.309
0.7		-0.294	1.155	0.00	1.059	1.059	192.322	-128.217	231.144
0.733		-0.289	1.194	0.151	1.059	1.07			
0.767		-0.255	1.211						

Note: PS –Start position [0.00 sec.], Straightening [0.033-0.133sec.]; Flipping [0.167-0.2]; Getting under barbell [0.233-0.367]; Barbell lifting and catching [0.4-0.767]

Table no. 2, figures no. 3 and 4 highlight the biomechanical indicators in snatch style executed by the Bulgarian athlete CS, with competition weight of 55.92kg, at the performance of 117kg. We notice: movement duration divided into 5 phases of the movement, barbell trajectory (X, Y); velocity and force of barbell lifting (X, Y, R- their resultant).

Figure no. 3. Getting under barbell and catching barbell (CS)

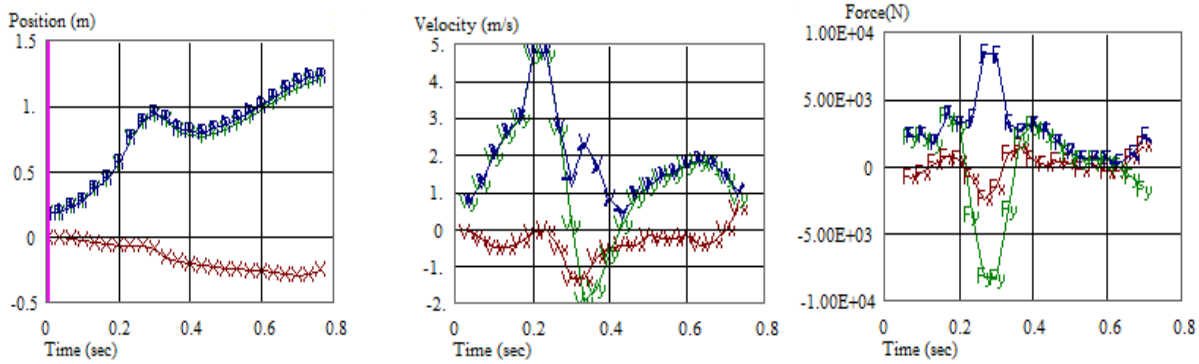


Figure no. 4. Trajectory of barbell, velocity and force of barbell lifting in snatch style (CS)

Table no. 3. Results of biomechanical indicators in snatch style, weight 109kg, class 56kg, (BGJ)

Time, sec	Movement phases	Position (m) X	Y	Velocity (m/s) V_x	V_y	V	Force (N) F_x	F_y	F
0.000	SP	-0.019	0.193						
0.033		-0.019	0.193	0.00	0.489	0.489			
0.067		-0.019	0.226	0.00	1.172	1.172	-248.603	1330	1350
0.1	Straightening	-0.019	0.271	-0.293	2.052	2.073	-580.076	1330	1450
0.133		-0.039	0.361	-0.684	2.736	2.82	82.867	828.682	832.815
0.167	Flipping	-0.064	0.451	-0.195	3.029	3.035	1080	1080	1520

0.2		-0.052	0.561	0.586	4.006	4.048	911.549	1820	2040
0.233		-0.026	0.716	0.879	5.178	5.252	165.738	911.55	926.495
0.267		0.0065	0.903	0.782	5.08	5.14	-828.681	-3070	3180
0.3		0.026	1.051	-0.098	1.563	1.566	-1240	-5720	5850
0.333		0.00	1.006	-0.684	-1.661	1.796	-165.736	-2490	2490
0.367	Getting	-0.019	0.941	-0.293	-1.368	1.399	911.551	1080	1410
0.4	under	-0.019	0.916	0.391	-0.391	0.553	580.078	1160	1300
0.433	barbell	0.0065	0.916	0.391	0.00	0.391	-165.736	1080	1090
0.467		0.0065	0.916	0.195	0.879	0.901	-82.868	1570	1580
0.5		0.019	0.974	0.293	1.856	1.879	-248.605	911.549	944.842
0.533		0.026	0.974	-0.098	1.954	1.956	-414.341	-248.603	483.2
0.567		0.013	1.038	-0.195	1.563	1.575	82.868	-165.735	185.298
0.6		0.013	1.103	0.00	1.759	1.759	165.736	414.34	446.258
0.633		0.013	1.141	0.00	2.052	2.052	-82.868	82.867	117.192
0.667	Catch	0.013	1.219	-0.98	1.856	1.859	-82.868	-414.34	422.545
0.7		0.013	1.277	-0.098	1.563	1.556	-165.736	-828.679	845.091
0.733		0.0065	1.341	-0.293	0.879	0.927			
0.767		-0.013	1.399						

Note: SP – Start position [0.00 sec.], Straightening [0.033-0.133sec.]; Flipping [0.167-0.2]; Getting under barbell [0.233-0.4]; Barbell lifting and catching [0.433-0.767]

Table no. 3, figures no. 5 and 6 shows the biomechanical indicators in snatch style, performed by the Spanish athlete BGJ, with competition weight 56kg, performance of 109kg. There are highlighted: movement duration divided into 5 phases of the movement, barbell trajectory (X, Y); velocity and force of barbell lifting (X, Y, R- their resultant).

Figure no. 5. Start position, getting under barbell and catch in snatch style (BGJ)

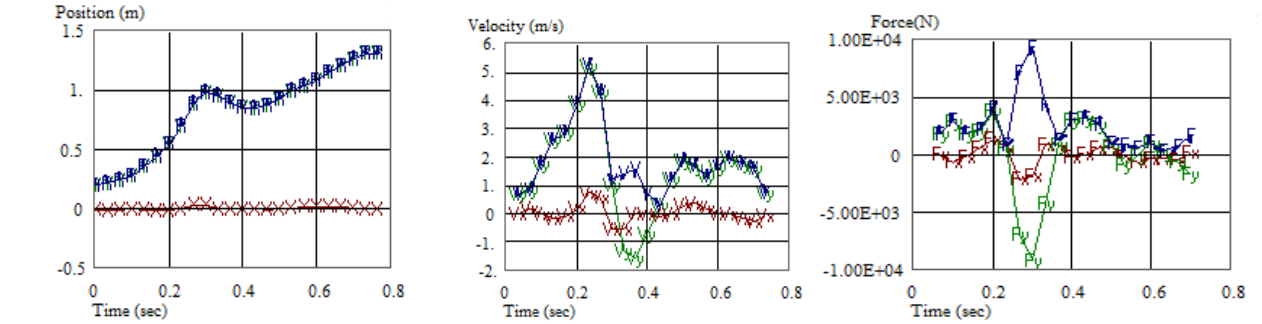


Figure no. 6. Trajectory of barbell, velocity and force of barbell lifting in snatch style

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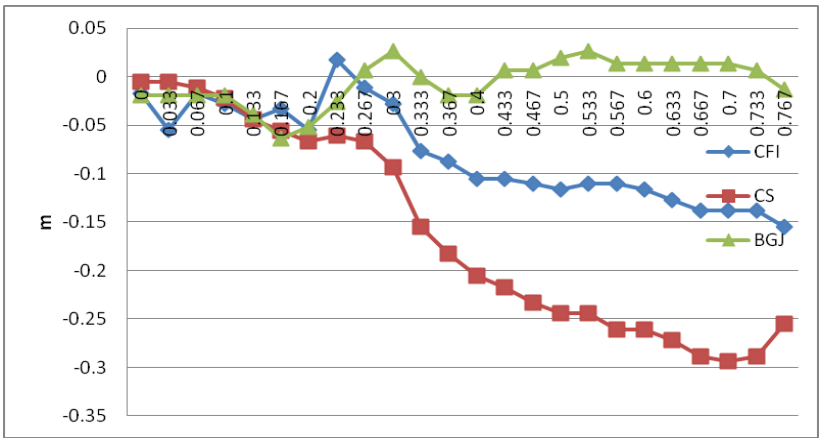

Figure no. 7. Results of barbell horizontal trajectory of the athletes CFI, CS and BGJ

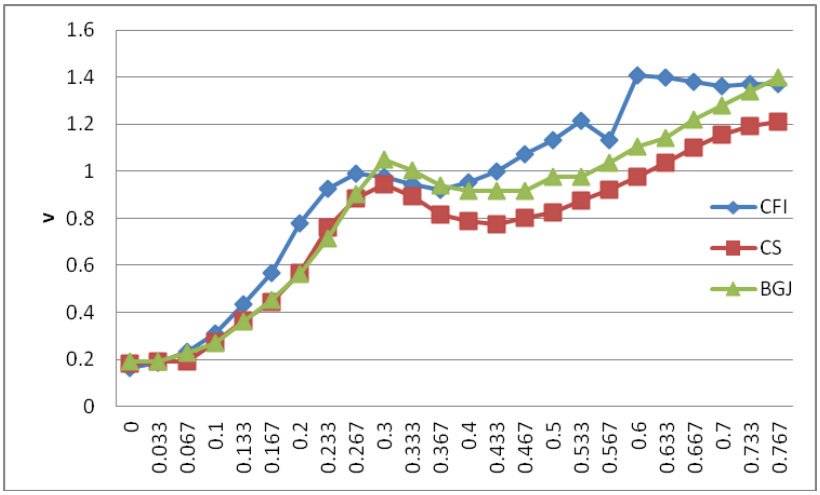

Figure no. 8. Results of barbell vertical trajectory of the athletes CFI, CS and BGJ

Figure no. 7 shows the trajectories of barbell lifting by the first three weightlifters (**CFI, CS și BGJ)**, in terms of horizontal movement, while figure no. 8 highlights the vertical movement.

Table no. 4. Results achieved in the European Championship for juniors, Bucharest 10.09.2011, snatch style, 56 kg class, men

No.	Full name /	Nationality	Event weight	Attempts (kg) 1	2	3	Result, (kg)
1	CFI	ROU	55.95	118	121	~~126~~	121
2	CS	BLG	55.92	113	~~117~~	117	117
3	BGJ	ESP	56.00	103	108	109	109
4	MS	BUL	55.98	105	~~108~~	108	108
5	SG	HUN	55.94	100	105	~~108~~	105
6	MA	BUL	55.75	100	104	~~106~~	104
7	MS	ARM	55.60	95	~~100~~	100	100

Table no. 4 presents the results achieved in the European Championship for juniors, Bucharest, 2011 in snatch style, 56kg class - men, showing the nationality, weight in event, resultants of each attempt and final result.

Discussions

The medal awards in weight-lifting contests depend on how much total weight is lifted with two lifting styles. Movement ofthe barbell is determined by the forces applied by the weight lifter. The relationships between displacement and time, or velocity and time, are often used at a practical level as the most important indices for as.sessing lifting technique (Baumann, Gross. Quade. Galbierz. & Schwirtz. 1988).

In this study, barbell trajectories, except for one subject, did not cross the vertical reference line

projected upward from the start position. Rather, the barbell was pulled toward the lifter during the snatch movement, especially from the first pull to transition

phase. This technique used during the first pull and transititm phase most likely requires the body to be inclined away from vertical, and the resulting barbell trajectory follows the inclination ofthe body (Isaka, T., Okada, J., Funato, K., 1996).

A number of 7 finalist weightlifters, 56kg class, participants in the European Championship for juniors, Bucharest 2011, were the subjects of this research. The study exemplified the characteristics of movement phases of the top ranked athletes.

In terms of results of the biomechanical indicators in snatch style, we notice the movement duration, analyzed every 4 frames, equal to 0.767 sec, while with normal speed – 3.068 sec;

The phases of the movement are analyzed by highlighting barbell horizontal and vertical travel (X, Y), where the start position (SP) was taken at the end of the execution (0.0- 0.033 sec); straightening at (0.1- 0.133 sec); flipping at (0.167- 0.333 sec.); getting under the barbell at (0.367- 0.633 sec); lifting at (0.433 – 0.633 sec.) and barbell catch at (0.7 – 0.767 sec.)

As for the kinematic features of barbell travel velocity in flipping phase at sec.0.2, we notice that the athlete CFI has a velocity of 5.438 m/s, the athlete CS has a velocity of 4.045 m/s and BGJ has a velocity of 4.006 m/s.

Regarding the lifting force of the barbell, we notice that the highest value is achieved by the athlete CFI, namely 4150 N in flipping phase; the athlete CS has 4180 N in the end of flipping phase and the athlete BGJ has 5850 N in the end of flipping phase.

The comparative analysis of the biomechanical characteristics of snatch style phases points out that the highest values are recorded in the end of "flipping" phase, fact that confirms the importance of this phase for lifting the weight as efficiently as possible.

The results achieved in competition in snatch style emphasize that the Romanian CFI lifted 121kg and was ranked the first, followed by the Bulgarian CS with a weight of 117 kg while the third place was taken by the Spanish BGJ who lifted a weight of 109kg.

Conclusions

The biomechanical video analysis of snatch style reveals the kinematic and dynamic characteristics of each phase of the performed style.

The results of the biomechanical indicators of the individual values highlight significant differences of barbell trajectories in snatch style, consistent with the body mass and the lifted weight and also with the personal technique of each athlete.

The performance of the biomechanical video analysis showed the kinematic and dynamic features of movement phases in snatch style, especially the flipping phase, which influenced the performances achieved in competition.

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ANALYSYS OF THE COMPETITION'S EFFORT TO BUILD THE ROWING ERGOMETER

URICHIANU ADRIAN ION[1]

Abstract
Purpose. Thanks to knowledge increasingly deeper phenomena and processes occurring in the practice of sport has highlighted the need for a more objective control over the evolution of the athlete during training and competition. Such specialists in the field of sports have introduced as means of preparation and control of the rowing simulators. Due to the introduction of the rowing on simulation, I get continuity of rowing training throughout the entire cycle, and thus the role of specific preparation used during cold weather.
*Methods***.** The methods used in the study are: the study of literature, observation method, method statistics.
Results. Ergometer in competitions sportsmen introduction has appellate on performance through:
reduction of learning time; analysis of possibilities of multiple plans in terms of effort, can detect and correct any mistakes; the possibility of testing effort capacity; increasing the capacity of forecasting of the behavior of the athlete in competition.
The contest on the Ergometer is an indicator of the level of physical training in that effort can be realized under conditions of stable and steady.
*Conclusion***s**. The ergometer has revolutionized the training of athletes, allowing training objectification by measuring the work done, do the times on different distances used in training, tempo de vâslire, distances traveled, calories consumed, the legislature made.
He creates the conditions of laying in rowing, and can also improve the athletes ' equipment.
Ergometer creates a new dimension to your training, by extending the periods of rowing with a certain repercutare in the outcome of the competition.
*Key words***:** rowing , exercise, sports.

Introduction.

In rowing specific physical training-oriented content, in particular towards the development of resistance and get the workforces (Florescu, et al. 1983). The means by which this is achieved are mainly water and as as exercise in specific tempo on rowing. In rowing, the resistance is ensured by the functional possibilities of the human body , the activity of the cerebral cortex, the ability of all systems and organs. This quality so complex motor requires a special physical training throughout the training cycle. It expresses the time limit during which can be continued effort of a certain intensity (Gagea, 2002).

Dominant character of rowing resistance requires an orientation towards educating especially the physical qualities (Neder, 2012). Specialized training for development of resistance (Nicu 1990) is causing a negative transfer speed and a positive for force. Therefore the education of labor resolves to some extent through resistance training. Sports performance training is as we know an applicant activity, requiring many hours of training and even sacrifices on the part of the athlete. The volume and intensity of continuous increase, while athletes repeated the exercises several times. To achieve internationally competitive performance (Dospinescu, 2006), training volume must pass the threshold of 1000 hours of training per year.

For testing and training athletes who practice canoeing are used extensively for rowing ergometer such as "Concept II".

Introduction of ergometer in rowing has many appellate over it, a few of which are the most important:

-reducing the time for learning;

-possibilities of analysis of the evolution of multiple plans in terms of effort, is very important in rowing, where, naturally there are no such conditions only rarely;

-determining the gaps such as motor (force blow, resistance level, etc.);

-possibility of detection and correction of technical mistakes;

-the possibility of testing effort capacity;

-establishing dependencies, the relationships between behaviour of rowing and motile manifestation to various other plans (physiological, biochemical);

-increase the capacity of forecasting the behavior of rowing in the contest;

Currently, an Ergometer is used in three directions, into three spheres of activity, all extremely

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important, namely:

1. Ergometer is used as a means of preparing the rowing. At the beginning of his appearance was used in the preparation of rowing, however, it can be said, in a limited way, being used only in the preparatory period, when adverse weather conditions is not allowed as per.

Of all the means used in the preparatory period, ergometer is the most important, because it can successfully substitute as in craft, due to the similarities with them, both on the driving action plan, thus allowing a good measure of technical achievement, and by its similarities to plane the effort, allowing rowing ergometer in all alurile and all intensities used. Thus, instead of general exercise (treadmill) ergometer offers the possibility of training with special training exercises, exercises which have effects similar to those specific workout.

During the summer ergometer is used as a means of preparing just in case weather conditions (rain, big waves) does not allow water exit, the rest is just dialled in specific training means (as in boat) and the means of physical training (strength and treadmill).

2. Ergometer is used as motor testing apparatus. Pedagogical supervision in sport is first and foremost a reliable information concerning the preparation of the athletes in the different stages.

Scientific management training is closely related to the continuous monitoring of the level of training of the athletes. Samples in small craft (simple) is rowing one of the most enlightening in progress tests, test preparation which gives full performance capacity measure (driving specific capabilities and technical capacity) of rowing.

Often, however, the variations in hydrographic and meteorological conditions make it difficult or even impossible to determine the individual's progress on the basis of simple cabling in the times. From this point of view is a ergometer tool to test the stable, less sensitive to the issues of technique, providing ideal conditions for testing identical every time. If attendance at the small craft is on checks the test to determine the ability of fundamental performance in rowing, ergometer is an ideal way to test the ability of rowing to generate power through rowing.

3. Ergometer is used in the control of sports rowing-medical. This is possible due to the fact that the rowing machine is a device for measuring the work and discipline that deals with the determination of Physic (muscle) by measuring the work done, is called ergometrie.

This camera has revolutionized the preparation rowing, allowing training objectification by measuring the work done, take on different periods are used in distance education, tempoului of rowing, distances traveled, calories consumed, to power. It creates conditions for studying the Biomechanics of rowing, and can also improve rowing technique.

The use of ergometer creates a new dimension on his training through training specific (Platonov, 1991) to lengthen (rowing) with some analysis in getting the results of the competitions.

The most important rowing machine used by most athletes in the world you are Ergometer type Concept.

The ergometer is a machine that simulates the action of rowing with the purpose of training or practicing rowing. Device for measuring the work, ergometer is a device that measures the amount of work done and set to show the energy generated. This study aims to analyze the physical effort and evolution in the rowing ergometer contest's junior, to have as objective control over the evolution of the athlete during training and competition (Epuran, 2005). Thanks to knowledge increasingly deeper phenomena and processes occurring in the practice of sport has highlighted the need for a more objective control over the evolution of the athlete during training and competition. So the sport's professionals were introduced as a means of training simulators and rowing machines.

Ergometer is a modular system of auxiliary devices and equipment for recording and study of movement education and body muscle control by visual feedback and nevizual.

The facilities of the system:

1. individualization of movements studied by attaching specific accessories;

2. settlement upon the resistance movement;

3. display the display during exercise of a graph template to which the subject contrasts with the normal at each movement;

4. store the missing information when forwarding individual files;

5. the possibility of processing information and interpretation of the evolution over time.

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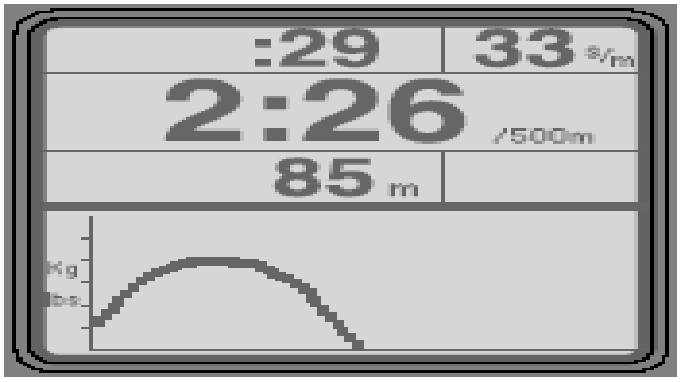

Figure 1. Ergometer Display row.

Ergometer-type Concept shows one of the important functions for analyzing the motion of rowing-force curve.

This software is the opportunity to build a curve of inside standard equipment of each exercise. Can be helpful just the coaches and the rowing elite or beginners.

Labor curve is a graphical application of labour reprezantare during rowing. Show variation in strength during the use of the legs, back and arms during the transition. A smoother curve shape shows a smoother implementation of the workforce. The area under the curve is higher, the coup that results will be better.

During execution the athlete can follow the on-screen values, optional digital or analogue form. At the end of a benefit showing a screen with synthetic average values of all parameters. Ergometer is a machine that simulates the action of rowing with the purpose of training or practicing rowing. Device for measuring the work, ergometer is a device that measures the amount of work done and set to show the energy generated. The word derives from the Greek exercise "ergon" meaning work and "metron", which means, so "Ergometer".

The monitor displays the following data:

Watts-Watts are a measure of force. If you choose Watts as the unit of measurement you will see how much power you produce. This measure helps to maintain the constancy with which rowing power.

And in the case of speed – the speed is expressed in units of time and looks after every time you kick make rowing on the 500 metres.

Calories – this unit shows the rate at which you burn calories at every blow. Every human being has a proper metabolism, and some are more efficient than others. In rowing, caloric data cannot be only approximated and assumed that the athlete weighs 80 kg.

The growth performance and the need for increased training efforts requires a high standard of quality, selection, which constitutes a guarantee to achieve superior performance. Advancement of knowledge relating to investigations, psychological, biomotric training morphological, physiological, as well as new knowledge in the methodology of the training are very important tools for sports training and determination of its objectives. The selection, along with the advancement of knowledge concerning the physiology of physical exertion and the sport-specific, as well as new knowledge in the methodology of the training are very important tools for sports training and determination of its objectives. Today it offers real value and information managers in practical work, with which you can make objective judgments at all stages of selection. There is no perfect test systems and universally valid because every athlete is an individual, and these individuals together, instead, form a team of unquestionable value. The coach needs to know how, what and how to test for each student.

Methods

The methods used in the study are: the study of literature, observation method, method statistics and the test method ergometer.

Results

Introduction of ergometer in rowing has appellate competitions over performance, by reducing the time of learning; analysis of possibilities of plans in terms of effort, can detect and correct any mistakes; the possibility of testing effort capacity; increase the capacity of forecasting the behavior of rowing.

In this study did analyze the physical effort of junior rowing Romania Cup competition, competition on an Ergometer, which took place in Snagov, at 16.03.2013. The sample is analyzed: 1 junior male individual, final race

Tabel 1. The results obtained in the final race of the first eight athletes

No.	Sports club	year of birth	Time min/sec.	power Watti	weight	W/kg,corp
1	CSS Bega Timisoara	1995	06:12.10/372.0	435	106	4,103773

2	CSS Calarasi	1995	06:15.80/355.0	422	98	4,306122
3	H.S. Traian Lalescu Orsova	1996	06:22.40/382.0	401	95	4,221052
4	CS Ceahlaul	1996	06:22.70/382.0	400	97	4,123711
5	H.S. Traian Lalescu Orsova	1995	06:27.20/387.0	386	89	4,337078
6	CSS Bega Timisoara	1995	06:31.40/391.0	374	96	3,895833
7	H.S. Traian Lalescu Orsova	1996	06:31.60/391.0	373	98	3,806122
8	CS Stiinta Constanta	1995	06:33.40/393.0	368	96	3,833333
	1	**2**	**3**	**4**	**5**	**6**

Table 1 shows the results of the first eight finishers in the final round of the athletes on the rowing machine and the times make in minutes/seconds. The power with which they competed the athletes is expressed in Watts. Differentiate athletes was done according to time and Watts. Column 1 represents the sports club which is contracted by the athlete, column 2 represents the year of birth of the athlete, column 3 represent the time recorded on the distance of 2000 at an Ergometer, column 4 means power expressed in watts on the same distance.

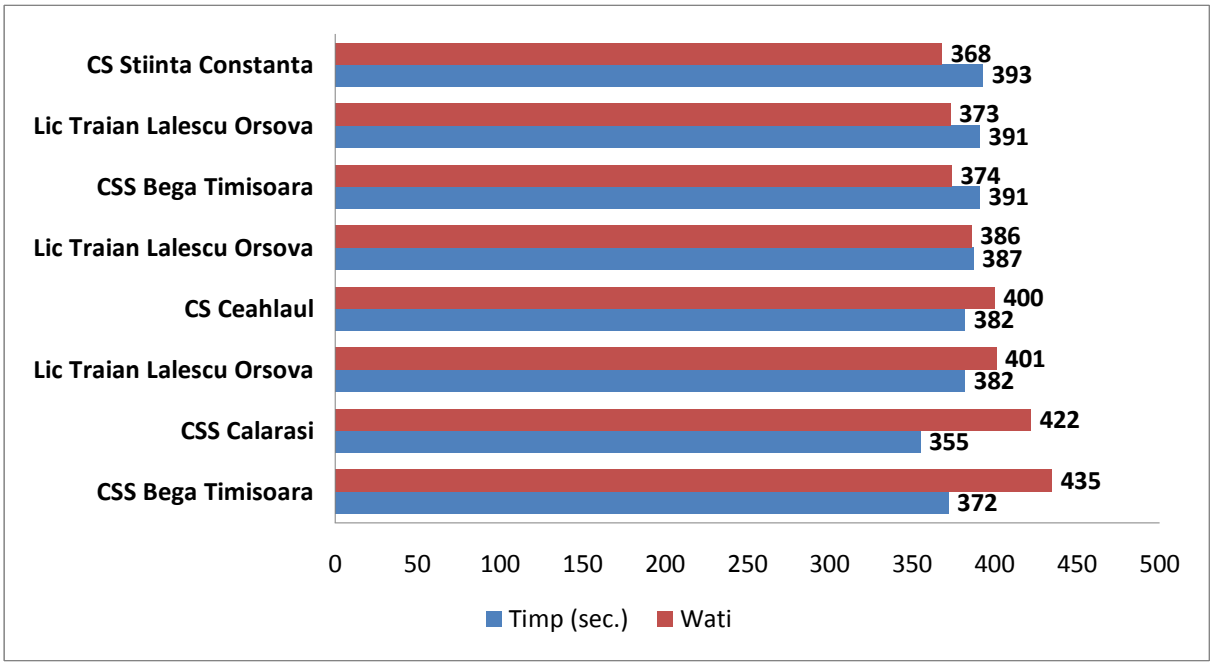

Figure 2. A graphical representation of the evolution of athletes

Figure 2 shows the difference of value that every sportsperson who competed in this competition.

Discussions

In this study we observe the evolution of each athlete's time over the 2000 m and the evolution of the rowing at the beginning of the preparation. We can appreciate that their results are good. Because the craft crew cannot appreciate the objective evolution of an individual, we will analyze these tables just to have a better overview, without claiming to be able to compare their developments with the rowing machine rowing 's.

All athletes know, during their work, certain growths, quality of different values and different levels of preparation; only that, for a proper test, it takes such a rating system enabling the development stage is the son, and of how it has progressed at its own pace, until immediately prior to testing. Often, this is not very easy to achieve. Until finally, observing individual developments, together with a series of objective tests will show, most likely the truth. Ultimately, the most important factors in the discovery of young talents are either those who plays in the achievement of the performance at the senior level, either those that are

essential for high performance, though their chances for improvement, over time, are quite limited.

Unlike other sports, rowing specialization cannot be practiced only after acquiring the vâslitului technique.

But this appropriation may not be undertaken anyway, but at a higher quality level as well as allowing the use of all capabilities of the athlete in the driving goal of the training: the fastest advancement of row.

Global performance is, at the present time, unthinkable without the unity of physical and technical training, constant improvement of materials. As such, technical training as well as other factors is decisive in achieving performance, it must promote a maximum yield.

Only proper technique allows an efficient and economic movements. Just forming a stereotype correctly, tailored to individual circumstances, can lead to the formation of a personal style that allows full exploitation of consummate ability of athlete performance.

We must remember that in rowing, where, in the competition, providing a sustained effort of great intensity the whole way, the technique must be the same at any time. It should therefore be strengthened, "strengthened" in the workout amid a heavy fatigue.

Sincronic and accuracy improve by training must be sought in any moment the sobriety movement.

This is an economic factor, because we see many oarsmen doing gymnastics with shoulders, pulling stray movements without any result over the coup, but that, on the contrary, it is absolutely unnecessary energy expenditure for the oarsmen.

Any mistake, no matter how small, gathered with blow blow increases in importance resulting in loss of precious seconds.

Also in the process of training these mistakes will constitute as many obstacles and difficulties in the preparation stages of athletes ' performance and high performance.

In conclusion, we can detach the idea that initiation into rowing technique is a complex process of great importance which should be planned on the basis of a well-established pattern which leads to better-informed efficiently through the formation of an athletes ideo motor fair representation and of a stereotype to duplicate as closely over the appropriated.

The data collected provides us with a broad picture of the situation, namely that the lack of training and exercise control (Dragnea, et al., 2002**)** on the tracks of the last period and said the word. Athletes have had 30 days to open training camp at the mountain (Piatra Arsa). Both workouts and exercise control tracks appreciates

much better work than group workouts, especially when we are dealing with issues of self-determination and emulation of the athletes.

So we can draw a first conclusion: Ergometrul looks better individual performance in the athlete's workout than craft.

If the water workouts can hide the lack of dedication and involvement in the effort, blaming atmospheric conditions, the partner or the boat, rowing machine, we cannot help but note the goal value and the potential of the moment. However, we must recognize that the training time is limited and we cannot afford not to insist on training in rowing crews (Radut, et al, 1976**)** that we present to the competitions. So coach appreciation remains as depending on all factors involved to choose the optimum ratio between the rowing workouts and exercise ones.

In table 1, column 4 means the weight of the athletes at the time of execution of the track. Column 5 is "slip index" (Watt/kg body), which reported on the accomplished provides an eloquent over the net's potential. It is known that an athlete with big table will perform better at rowing machine, but on the water extra pounds will help him at the boat slip.

Conclusions

After the effort of junior athletes to the competition, we can say that they behaved well, they managed to classify in front of fellow athletes from clubs. Practical-applicative part is the most important way to achieve this goal. When you identify a correlation between the results from Ergometer and competition performance, then ergometer will be used as a means of providing training and State of the art rowing and its efficiency. If we talk about the training of the rowing, we are not talking only of weightlifting, but by all means used. Working with dumbbells is beneficial insofar as technically correct executed and does not cause trauma. Maximum live load, speed, repetitions, number series and breaks should correspond to the objective pursued and the means employed to produce the desired results. All the means used must fall into two fundamental requirements: on the one hand to respect the kinetics of motric rowing machines and exercise a greater requirement than was commonplace athlete body.

Training the ability of force in rowing — whether we speak of the means employed on land whether we refer to those water-must pursue the same principles, namely to address the main muscle groups that take part in the Act of rowing and motric the request must be sufficiently large to cause a new adaptation of the body to a higher level. The training principles of force propose methods of adaptation of the organism to various loads used in preparation and make recommendations concerning the individualisation programme according to the specific needs of the athlete and the sport. Here are a couple of ways: the progression of cargo; Overload; the stepwise approach; cargo reverse steps; constant tracking, etc. It can be said that constant load method fits best with the

needs of the development of the capacities of canoeing. This statement does not preclude the effectiveness of other methods.

The method is organized on four stages weekly cycles. The first three weeks are neuromuscular adaptation and biological organism in constant loads of requests. Following a week of rebalancing, which reduces the amount of permissible aid intensities increase thus eliminating residual fatigue. In the second half of the week is scheduled the measurement of training effects (the tests) the value of the level adjustment.

The next stage is scheduled with the new values of the training requests as a result of the test results of the preceding stage. The new phase will run with a higher level of applications, which will determine a new qualitative adaptation of the body and its functions.

Very important is a rule in the process of training namely training every lesson should include activities that require the same energy system.

Sports performance training is as we know an applicant activity, requiring many hours of training and even sacrifices on the part of the athlete. The volume and intensity of continuous increase, while athletes repeated the exercises several times.

The research that I have proposed an answer to part of the present needs of the rowing, the uncertainties in this direction and, in general, to novelty and progress.

At the same time, these results will be used to improve training programmes for athletes from the rowing clubs.

The relationship between water and the workouts on the Ergometer has complied with the optimal use of research in order to obtain the highest performance level.

Prediction results from Ergometer (Gagea, 2006) is dependent on the different levels of training and competition experience. Results from the rowing machine can be status indicators and the selection for proximele competitions only if training and experience that competition is high.

The correlation between the results of the exercise and competition performance is slightly analyzed internationally without necessarily saying that is neglected or uninteresting, but it can be said that it is still a non public information because it remains a trade secret for most countries with tradition and performance in rowing.

Rowers were using ergometer to teach and reinforce rowing technique, to train and become familiar with the specific effort to acquire the necessary qualities of a winner, and the coaches use them to diagnose and evaluate the athlete from the technically and physically, as well as to forecast the evolution in order to establish its action plan for attainment of the objectives proposed.

Prediction of the rate of progress and benefit from the proximele competitions may be based in modest terms, the correct interpretation of information derived from testing on ergometer. It goes without saying that this information, though, need to be corroborated with comments the coach, doctor's lot and interpreted in terms of major competitions

For further growth of the performance does not diminish any sides, research that could help coaches and Methodists in their work with athletes.

These factors are very many in number and virtually no one can make a complete list of them. At the same time, most are in close contact with each other, it influenced each other.

Of course, we can talk and can be investigated on a lot of factors that have a great importance in the success in rowing, but according to the technicians of the Romanian as "priority problems in obtaining some valuable World Cup performances are achieving at a high quality level of quantitative indicators of readiness and by a selection of human material, all of them confirming the requirements rowing performance".(Florescu, 1983).

At the same time we can say that everything that can influence a person's physical environment, such as air, water, Sun and other physical factors of the environment, with direct influence on which boat (wind, wave, etc.) – or social-opponents, teammates, the Gallery, the cantonment, the coaches and all other persons from the technicians, and even the feelings, attitudes, challenges and other psychic influences-can constitute a factor or restrictive for facilitativ of the sport.

So competition in rowing performance is given by the product of the effects caused by the action of concentric to a multitude of factors among which we remind: the amount of biological material, the exercise of sports training, physical investment to ensure sports training cantonamentelor in terms of using the latest scientific concepts of training and recovery, through a managed. Factors which may be considered important or relevant sports performance are in the hundreds. They can group the factors: physical, biological, metodologici, organizatorici, random and circumstantial.

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THE INFLUENCE OF THE ANATOMO-MORPHOLOGIC FEATURES ON THE SPORT ACHIEVEMENTS IN SWIMMING

VAIDA MARIUS[1]

Abstract
This research took into account the premise according to which, swimming, like all the other sports,is susceptible of being perfected.This paper tackles the multi-valent issue of the correlation between the somatic features of the swimmer and the emergence of superior achievements.
Subjects and Applied Methods
The research was carried out during a period of two years and it regarded the measurement of the main anthropometric parameters, which are specific to swimming, together with the measurements of the achievements obtained in the specific trials.The subjects were nine-year-old during the testing of the first year and respectively, ten-year-old during the one of the second year.The anthropometric measurements targeted the following values: the waist, the body weight, the biacromial diameter, the bitrohanterian diameter, the handspan, the length of the palm, the length of the foot.The specific trials which were tested were as follows: the 50 metres crawl, the 50 metres back, the 50 metres breaststroke, the 50 metres butterfly.The groups were also chosen with respect to their somatic features in order to emphasize their importance for the evolution of the results.Their training did not differentiate in any parameter, such as the intensity or the volume.The research, as well as the measurements methods of the anthropometric abilities and the measurements used in the specific trials were identical during the period in which the research was carried out.
Results
Analysing the information which has been provided and interpreted, it can be observed that, during all the specific trials, the experiment groups (boys and girls) had a more or less significant evolution when compared with the monitored groups, which stresses the importance of the anthropometric parameters for the emergence of superior achievements in swimming, knowing that the training of the latters didn't differentiate in any aspect.
Conclusions
Taking into account this data, it can be asserted that the swimmers' somatic features have a direct influence on the emergence of superior sport achievements, the interrelationship between the anthropometric values and the superior sport achievements being thus shaped.
Another important feature is the shape of the swimmer's body, as it is already known that the longiline swimmers, who have bigger body segments, hold a greater advantage when compared with the short ones, which is proved by the results obtained in this research. This research claims to be a methodological point of reference regarding the realisation of the selection process in swimming. This process is a very complex one, being aware of the sportsmen's anthropometric abilities is one of the significant conditions which have to be fulfilled in order not to select individuals who, later, won't fit the specific biotype of the great swimmers, their achievements remaining poor.
Keywords: anatomo-morphologic features, achievements, swimming.

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Introduction

This topic is quite complex, indirectly targeting and solving problems of the selection process of young swimmers, knowing that this process is very important, detection of talents and of ideal models being one of the main priorities. Also, based on a forecast of the biological development made accurately and scientifically, complemented by a rational training course, superior results can be obtained. There is a number of specific constitutional swimming biotypes in specialised literature whose degree of being achieved depends on the age of the swimmers. If these biotypes are combined with the development of certain capacities and with the improvement of various functional indicators, they can ultimately lead to achieving a high level of performance.

The swimming procedure is also influenced by the anatomic and physiologic features of the sportsman. Through the specific swimming movements, through the specific underwater breathing and through the horizontal position, swimming is radically different from the normal movements of an individual, the upper limbs holding a key role in underwater movement, as long as the legs hold the key role in moving on land. As it is already known, the main areas with which the movement is performed in water are hands and feet.

In a selection process which is carried out scientifically, features which cannot be perfected have a major role in the first phase of selection, the perfectible ones being monitored during other phases of the selection. Features that have a high degree of heritability are: stature, limb length, length of various skeletal segments, length of foot and hand size, bitrohanterian diameter, biacromial diameter etc.

The best anthropological type for swimming is the longiline type in which length is predominant in comparison with depth and width. In specialised surveys it has been shown that there are some differences between certain somatic indicators and the specific swimming tests.

Because of the specificity of this Olympic sport, a series of adaptive processes are taking place in the body. The individual weight also has an important influence on the phenomenon of floating, as well as the palms size and the length of the feet. At the same time, learning proper technique together with some favourable somatic indicators and a proper physical training in accordance with the age of the swimmer can be a recipe for success for the selected swimmers.

Equipment and methods

This research assumed the hypothesis according to which a selection based on the specific somatic features of the swimmer will determine the emergence of the sport results. This paper tackles the polyvalent matter of the correlation between the somatic features of the swimmer and the emergence of superior results.

The research was carried out during a two-year period and it targeted the measurement of the main anthropometric parameters, which are specific to swimming, together with the measurements of the achievements obtained in the specific tests. The subjects were nine-year-old during the testing of the first year and respectively, ten-year-old during the one of the second year.

The methods and the research procedures which have been used are the following ones: the experimental method, the observation, the bibliographic study, the method of measurements and records, the logic method, the statistical and mathematical method and the graphical method. Statistical processing was based on the following indicators: arithmetic average, median, upper limit, lower limit, range, standard deviation, coefficient of variation. The anthropometric measurements aimed the following indicators: waist, body weight, biacromial diameter, bitrohanterian diameter, span, hand length, the length of the foot. The specific tests were the following: 50 m crawl, 50 m back, 50 m breaststroke and 50m butterfly.

For the attainment of this experiment were tested 16 athletes - 8 boys and 8 girls, divided in two categories of groups: experimental (4 boys and 4 girls) and control (4 boys and 4 girls). Also, the groups were also chosen with respect to their somatic features in order to emphasize their importance for the evolution of the results. Their training did not differentiate in any parameter, such as the intensity or the volume. The research, as well as the measurements methods of the anthropometric abilities and the measurements used in the specific trials were identical during the period in which the research was carried out.

Results.

The results are presented and interpreted below interpretation based on 1-5 tables which are statistical values of anthropometric skills both boys and girls in both tests (initial and final) in the experimental groups and control and based on the average values of specific samples tested.

Table 1. Statistical values of the anthropometric skills of boys - experiment group

	Boys - initial						
	Waist	Weight	Biacromial diameter	Bitrohanterian diameter	Span	Hand length	Length of the foot

Average	141,88	30,63	33,00	26,25	140,25	14,88	20,75
Minimum	140	28,5	32,5	26	140	14,5	19,5
Maximum	146	32	33,5	27	141	15	22
Range	6	3,5	1	1	1	0,5	2,5
Median	140,75	31	33	26	140	15	20,75
Standard deviation	2,78	1,55	0,41	0,50	0,50	0,25	1,19
Coefficient of variability	1,96	5,05	1,24	1,90	0,36	1,68	5,74
Boys - final							
Average	147,13	35,18	34,23	27,15	147,70	15,98	22,13
Minimum	144	33	33,7	27	146	15,5	21,5
Maximum	148,5	37,8	34,9	27,5	148,3	16,4	23
Range	4,5	4,8	1,2	0,5	2,3	0,9	1,5
Median	148	34,95	34,15	27,05	148,25	16	22
Standard deviation	2,10	1,98	0,50	0,24	1,13	0,37	0,75
Coefficient of variability	1,43	5,62	1,46	0,88	0,77	2,31	3,39

Table 2. Statistical values of the anthropometric skills of girls – experiment group.

	Girls - initial						
	Waist	Weight	Biacromial diameter	Bitrohanterian diameter	Span	Hand length	Length of the foot
Average	140,38	30,13	33,13	25,88	141,63	14,93	20,55
Minimum	132	28	32,5	25,5	140	14,5	20
Maximum	145	34	33,5	26	145	15,2	21,2
Range	13	6	1	0,5	5	0,7	1,2
Median	142,25	29,25	33,25	26	140,75	15	20,5
Standard deviation	5,74	2,66	0,48	0,25	2,29	0,30	0,64
Coefficient of variability	4,09	8,82	1,45	0,97	1,61	2,00	3,12
Girls - final							
Average	146,10	32,60	33,83	28,63	145,68	15,73	22,00
Minimum	144	31,5	33,5	28	144	15,5	21,5
Maximum	147,2	34	34,5	29	146,5	16	22,5
Range	3,2	2,5	1	1	2,5	0,5	1
Median	146,6	32,45	33,65	28,75	146,1	15,7	22
Standard deviation	1,47	1,04	0,46	0,48	1,14	0,22	0,58
Coefficient of variability	1,00	3,18	1,35	1,67	0,78	1,41	2,62

Table 3. Statistical values of the anthropometric skills of boys - control group

	Boys - initial						
	Waist	Weight	Biacromial	Bitrohanterian	Span	Hand	Length of

			diameter	diameter		length	the foot
Average	137,50	28,25	32,13	25,75	138,50	14,50	20,13
Minimum	136	27	31,7	25	137	14	20
Maximum	140	30	32,6	26	142	15	20,5
Range	4	3	0,9	1	5	1	0,5
Median	137	28	32,1	26	137,5	14,5	20
Standard deviation	1,91	1,50	0,44	0,50	2,38	0,58	0,25
Coefficient of variability	1,39	5,31	1,38	1,94	1,72	3,98	1,24
Boys - final							
Average	143,25	32,15	33,10	27,18	144,75	15,05	21,88
Minimum	142	31,2	32,8	27	143	15	21,5
Maximum	146	33,6	33,4	27,5	148	15,2	22,5
Range	4	2,4	0,6	0,5	5	0,2	1
Median	142,5	31,9	33,1	27,1	144	15	21,75
Standard deviation	1,89	1,10	0,26	0,24	2,36	0,10	0,48
Coefficient of variability	1,32	3,42	0,78	0,87	1,63	0,66	2,19

Table 4. Statistical values of the anthropometric skills of girls – control group.

	Waist	Weight	Biacromial diameter	Bitrohanterian diameter	Span	Hand length	Length of the foot
Girls - initial							
Average	137,38	29,88	32,25	25,38	139,50	14,65	20,13
Minimum	132,5	27	32	25	136	14	19,5
Maximum	142	35	32,5	25,5	147	15	20,5
Range	9,5	8	0,5	0,5	11	1	1
Median	137,5	28,75	32,25	25,5	137,5	14,8	20,25
Standard deviation	3,90	3,66	0,29	0,25	5,07	0,47	0,48
Coefficient of variability	2,84	12,25	0,90	0,99	3,63	3,23	2,38
Girls - final							
Average	144,38	32,70	33,05	26,63	144,25	15,15	21,89
Minimum	143	31,2	32,6	24	143	15	21,5
Maximum	147	35,8	33,4	27,5	146	15,5	22,5
Range	4	4,6	0,8	3,5	3	0,5	1
Median	143,75	31,9	33,1	27,5	144	15,05	21,75
Standard deviation	1,80	2,17	0,34	1,75	1,26	0,24	0,48
Coefficient of variability	1,24	6,63	1,03	6,57	0,87	1,57	2,19

Table 5. The average values of the samples tested

	Boys				**Girls**			
Control group	50 metres crawl	50 metres back	50 metres breaststroke	50 metres butterfly	50 metres crawl	50 metres back	50 metres breaststroke	50 metres butterfly
Arithmetic	39,40	46,95	49,98	46,51	40,88	47,46	50,39	47,06

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average **initial**								
Arithmetic average **final**	36,75	45,65	47,70	42,10	38,29	45,98	48,43	43,04
Experiment group	50 metres crawl	50 metres back	50 metres breaststroke	50 metres butterfly	50 metres crawl	50 metres back	50 metres breaststroke	50 metres butterfly
Arithmetic average **initial**	39,65	46,71	49,50	46,75	40,64	47,63	49,98	46,92
Arithmetic average **final**	35,95	44,48	46,82	41,40	36,45	45,12	47,14	39,34

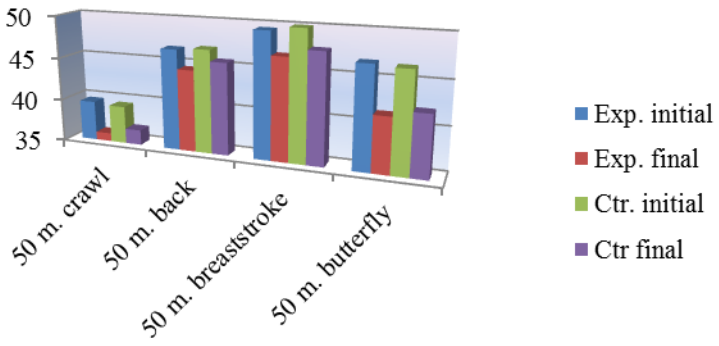

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Figure 1. Comparison of the two groups (experimental and control) in samples tested - boys

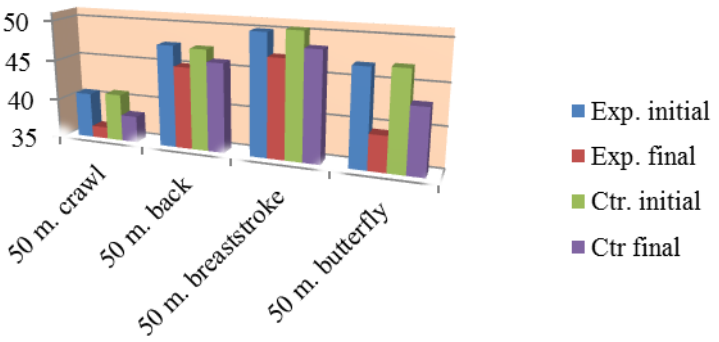

Figure 2. Comparison of the two groups (experimental and control) in samples tested - girls

Discussions

Within the experimental group (table 1), the average of the waist of the boys is 141.88 cm. in the initial testing and 147.13 in the final one, the difference between the two years is 5.25 cm. However, the value of the weight is 30.63 kg in the former year and 35.18 kg in the latter, which represents a difference of 4.55 kg. These results correspond with. Jivan. I.S. (1999) and Finichiu M. (1998) results.

Also, the biacromial diameter has 33 cm. in the former year and 34.23 cm. in the latter, a difference of 1.23 cm., while the bitrohanterian diameter has an average of 26.25 cm. in the former testing and 27.15 cm. in the latter, a difference of 0.9 cm. The span evinces the biggest increase, which is 7.45 cm., its values being 140.25 cm. in the former year and 147, 70 cm. in the latter.

Regarding the length of palm, the values recorded are 14.88 cm. in the former testing and respectively 15.98

cm. in the latter testing, the increase is 1.10 cm., while the anthropometric parameter named the length of the foot evinces values of 20.75 cm. in the former testing and 22.13 cm. in the latter, the actual increase is 1.38 cm. All the values of these parameters are grouped around the average, this group possessing a high degree of homogeneity, as can be seen in table 1.

From the above table it can be seen that within the experiment group of girls (table 2), the waist average is 140.38 cm. in the former testing and 146.10 cm. in the latter testing, the rise is 5.72 cm., while the average weight is 30.13 kg. the former testing and 32.60 kg. in the latter testing, a difference of 2.47 kg. Regarding the span, the average is 141.63 cm. in the former testing and 145.68 cm. in the latter, the actual increase is 4.05 cm.

In addition, the values of the diameters evince increases, which are variable, the biacromial diameter is 33.13 cm. the first year and 33.83 cm in the second, the increase being of 0.70 cm compared with the bitrohanterian diameter which evinces a length of 25.88 cm. the former test and 28.63 cm. in the latter, the increase is 2.75 cm.

At the same time, the length of the hand evinces an increase of 0.80 cm., the values are 14.93 cm. the first year and 15.73 cm. in the second, while the length of the foot evinces an increase of 1.45 cm., starting from 20.55 cm. in the first testing, reaching 22 cm. in the second testing. The values of the parameters are grouped around the average, excepting for the waist whose values have a high degree of variability, the chosen group evincing a high degree of homogeneity, as can be seen in table 2.

In the control group of boys (table 3), there is an increase of 5.75 cm. of the average value of the waist , the average value being 137.5 cm. in the former testing and respectively 143.25 cm. in the latter testing. The weight also evinces an increase of 3.9 kg., the average value of the first measurement is 28.25 kg. comparatively to the value of the second measurement which is 32.15 kg. The average value of the span is 138.50 cm. in the former testing and 144.75 cm. in the latter, the increase is 6.25 cm. The biacromial diameter keeps its tendency to increase like in the other groups, its values being 32.13 cm. in the former year and 33.10 cm. in the latter year, the average being 0.97 cm. Also, the bitrohanterian diameter evinces increasing values, the average is 25.75 cm. the first test and 27.18 cm. in the second, the increase of the average is of 1.43 cm. The results obtained in this study confirm the words of Jivan I.S. (1999) finding that the waist represents one of the characteristics depending on which the swimmers specialty is realized.

Regarding the length of the hand and the foot, an increase of 0.55 cm. of the first parameter can be observed. For the first parameter, the values are 14.5 cm. in the initial testing and 15.05 cm. in the final testing, compared with the growth of 1.75 cm. of the average length of the foot, the average values being 20.13 cm. and 21.88 cm. All the values of these parameters are clustered around the average, this group possessing a high degree of homogeneity, as can be seen in table 3.

The girls' control group essentially maintains the tendency of increase of values (table 4), the average waist being 137.38 cm. in the initial testing and 144.38 in the final testing, with an increase of 7 cm. In addition, both the weight and the span evince increasing values, the weight gains 2.82 kg. from 29.88 kg. to 32.70 kg., while there is an increase of 4.75 cm. in the average values of the span, 139.50 cm. in the initial testing compared to 144.25 cm. recorded in the final testing. The biacromial diameter evinces an increase of 0.80 cm. (32.25 cm. in the first year and 33.05 cm. in the second) as compared to the development of the bitrohanterian diameter which is 1.25 cm, the values are 25.38 cm. in the former year and 26.63 cm. in the latter.

At the same time, it can be seen the tendency of increasing of the length of the hand (the increase is of 0.50 cm., 14.65 cm. in the first year compared to 15.15 cm in the second) and the length of the foot, with an increase of 1.76 cm from 20.13 cm in the former testing to 21.88 cm. in the latter. All the values of these parameters are clustered around the average, excepting for the span in the initial measurements where the values are highly variable, this group possessing a high degree of homogeneity, as can be seen in table 4.

The calculations of the average of the four specific tests show that the evolution is higher in the experimental groups (table 5), the improvement of the 50 m crawl for the boys in the experimental group is 3.70 seconds and 2.65 seconds in the control group, the results obtained in the second year are 35.95 seconds in the first group and 36.75 in the second group. In girls, the final test results were 38.29 seconds in the control group and 36.45 in the experiment group, the progress of the former group being 2.59 seconds compared with the experiment group who had a progress of 4.19 seconds. These results correspond with Badescu V.et al., (2008) and Finichiu M. (1998) results.

In the 50 m back test, the boys' average is 45.65 seconds in the final testing in the control group and 44.48 seconds in the experiment group, the increase being 1.30 seconds in the former group and 2.23 seconds in the latter group, while in girls the average values were 45.98 seconds in the control group and 45.12 in the experiment, the actual progress is 1.48 seconds in the former group and 2.51 seconds in the latter group.

The 50 m breaststroke test maintains the growing tendency that we have seen in the previously interpreted tests, in boys the progress is 2.28 seconds in the control group and 2.68 seconds in the experiment group, the final results being 47, 70 seconds in the former group and 46.82 seconds in the latter. In girls,

the final average values are 48.43 seconds in the control group and 47.14 seconds in the experiment group, the progress of the first group is 1.96 seconds while the evolution is 2.84 seconds in the second, as can be seen in table 5. These results correspond with. Jivan. I.S. (1999) and Finichiu M. (1998) results.

In the 50 m butterfly test the boys' final test values were 42.10 seconds in the control group and 41.40 seconds in the experiment group, the growth was of 4.41 seconds in the first group and 5.35 in the second, while in girls the test showed an average of 43.04 seconds in the control group and 39.34 seconds in the experiment, the progress of the first group is 4.02 seconds and the progress of the second is 7.58 seconds, as can be seen in table 5.

From what is shown above, it can be seen that in all the specific tests, experimental groups (boys and girls) had a breakthrough more or less significant compared to the control groups, which emphasizes the importance of anthropometric parameters in the emergence of superior results in swimming, knowing that their preparation did not differentiate by any parameter of the training (intensity or volume). These results correspond with. Jivan. I.S. (1999) and Finichiu M. (1998) results.

Conclusions

Based on these results, we can say that the swimmers' somatic features influence the appearance of superior achievements in sport, being thus shaped the relationship between the anthropometric indices and higher sport results.

The presented study highlights the importance of the anthropometric parameters in the sport branch named swimming, without minimizing the importance of other factors specific to sport performance such as swimming technique, general motional capacity, etc., anthropometric parameters being one of the main criteria for the selection of performers.

Another important feature is the shape of the swimmer's body, knowing that longilin swimmers who have larger sections have an advantage compared to those of small stature, as demonstrated by the results obtained in this study. Also, the heavy specific weight characteristic to the force type, where the waist is relatively smaller and the overly developed muscles impede in achieving top results, studying the parents' somatotype is a modern requirement for selection, thereby eliminating the selection of low-waisted athletes or who evince tendencies towards the endomorph element.

The planned objectives for each sportsperson must take into account the somatic constitution,the functional abilities and the psychological structure of the individual, according to which their specialization on tests and procedures should be realised.

This study is intended to be a methodological point of reference in terms of the realisation of the selection process in swimming, this process is very complex, one of the conditions required to achieve significant performance is being aware of the athletes' anthropometric capabilities in order not to select individuals who later won't fit in the specific biotype of the great swimmers, their results remaining thus poor.

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