

ASSOCIATION BETWEEN GRADED EXERCISE TEST INDICATORS OF CARDIOVASCULAR DISEASE RISKS AND PERIPHERAL VASCULAR STIFFNESS

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ABSTRACT

Exaggerated systolic blood pressure (SBP) responses to graded exercise testing in normotensive adults have been associated with risk of future hypertension. Endothelial dysfunction is one of the mechanisms that lead to functional and structural changes in resistance vessels. Venous occlusion plethysmography (VOP) non-invasively characterizes endothelium-dependent vasodilatory capacity in peripheral arteries (reactive hyperemia: RH).

PURPOSE: To determine if an association exists between exaggerated SBP responses to graded exercise and peripheral vascular vasodilatory capacity.

METHODS: Subjects were 50 young males (Mean \pm SD: age = 22.4 ± 2.6 yr; body fat = 24.3 ± 6.1 %; BMI = 27.7 ± 5.7). Post-occlusive RH was assessed after a 5-min brachial artery occlusion using VOP and standard procedures recommended by the manufacturer (Hokanson EC-6, Bellevue, WA). Each subject performed maximal cycle ergometer exercise tests with a 15 watts/min ramping protocol. Blood pressures (BP) were measured at rest, every 2 min during, and at 15 sec intervals after exercise.

RESULTS: During exercise, no relationship was found between any of the exaggerated SBP indices and the measures of peripheral artery status by VOP. Furthermore, when individual SBP responses from peak exercise at the highest vs. lowest tertiles were contrasted, no differences in the VOP measures of vascular status were found.

CONCLUSION: Exaggerated SBP response to graded exercise in young adult males seems to be regulated largely by factors other than peripheral vascular status, as assessed by VOP/RH.

KEY WORDS: cardiovascular disease, peripheral vascular stiffness, graded exercise.

INTRODUCTION

It has been shown that adolescents and young adults with an exercise SBP > 195 mmHg had a 2-3-fold increased risk for future sustained hypertension (Dlin R.A., Hanne N, Silverberg D.S., et al., 1983). A possible mechanism responsible for such exaggerated BP responses might be reduced capacity to adjust peripheral resistance and distribution of blood flow with increasing cardiac output during exercise (Miyai N, Arita M, Morioka I, Et Al., 2000). Functional and structural changes in resistance vessels can be affected by endothelial dysfunction (Tzemos N, Lim Po, Macdonald Tm, 2002). Studies have monitored dysfunction of resistance vessels by using non-invasive techniques such as measurement of post-ischemic reactive hyperemia in the human forearm (Alomari Ma, Solomito A, Reyes R, Et Al. 2004). Limited research has been done to assess the relationship between exaggerated SBP in exercise testing and vascular status by the VOP/RH test in young normotensive adults.

The objective of this analysis was to determine if an association exists between exaggerated SBP responses to graded exercise and peripheral vascular vasodilatory capacity.

METHODS

Subjects

Between November 2004 and May 2006, 50 young (age = 22.4 ± 2.6 yr) men were recruited to participate in this study. Participants were free of known cardiovascular or other metabolic diseases. Diabetics, asthmatics and individuals taking any medication that may affect cardiovascular function were excluded from participation. Smokers and individuals with acute medical conditions (e.g., orthopedic injury), active infection and/or on pharmacotherapy with known vascular effects (e.g., anti-inflammatory therapy, cardiovascular medications) were disqualified. The study was approved by the Institutional Review Board of Virginia Polytechnic Institute and State University.

Anthropometrics

Body mass (kg) and height (cm) were used to calculate Body Mass Index (BMI, kg/cm^2). Measures were obtained while subjects were in lightweight clothing and socks. Total body fat was quantified using dual energy x-ray absorptiometry (DXA) (Hologic QDR 4500A, Bedford, MA). All measurements from DXA were obtained and analyzed by one investigator. Weekly scans of an external soft tissue bar were used to calibrate the DXA measurements, and test-retest reliability of this unit in our laboratory has been previously reported (Nickols-Richardson Sm, Miller Le, Wootten Df, Et Al., 2005).

Venous occlusion plethysmography

Subjects were instructed to refrain from food, alcohol or caffeine for 12 hours, and vigorous physical activity for 24 hours before the procedures. Upon arrival, each rested in a supine position in a quiet, dark, air-conditioned room (constant temperature, 22°C to 24°C) and blood pressure was measured. Prior to evaluation of their basal forearm blood flow, subjects maintained the supine resting position for 10 minutes. During this time, blood pressure cuffs were positioned around the left upper arm and wrist, and a mercury-in-silastic strain gauge was placed at the widest part of the forearm. The strain gauge was connected to a plethysmograph (EC-5R system, Hokanson, Inc; Bellevue, WA). The forearm was extended, slightly supinated and supported by a foam block ensuring the arm was above heart level. Immediately before the blood flow measurements, hand circulation was occluded by inflating the wrist cuff to a pressure 50 mm Hg greater than the subject's measured systolic blood pressure. The upper arm cuff was inflated to 50 mm Hg for 7 seconds in each 15-second cycle to occlude venous outflow from the arm, using a rapid cuff inflator (EC-20, Hokanson, Inc; Bellevue, WA). Resting blood flow was determined by calculation of the mean of middle three measurements taken within 2 min. The forearm blood flow response during reactive hyperemia was evaluated. Arterial occlusion was achieved by inflating the cuff on the upper arm to 50 mm Hg above systolic blood pressure for 5 minutes. After release of the upper arm cuff, forearm blood flow was measured every 15 seconds for 3 minutes. Following the test all readings were manually analyzed to eliminate any cuff artifacts using proprietary software (NIVP3 version 2.9, Hokanson, Bellevue, WA). Blood flow was expressed as milliliters per minute per 100 ml of forearm tissue volume.

Exercise testing

Each subject performed a maximal cycle exercise test on an electronically-braked ergometer (Ergometrics 800, SensorMedics, Yorba Linda, CA). Subjects began 1-minute warm-up by pedaling at a self-selected rate between 50–80 rpm with a constant load of 25 W/min. Load was increased automatically by 15 W/min until volitional fatigue occurred. The treadmill tests were terminated according to the guidelines recommended by the American College of Sports Medicine (Chang HJ, Chung J, Choi Sy, 2004). Subjects recovered in the seated position, with minimal-load pedaling. Systolic and diastolic blood pressures were taken at rest, exercise and every 15 seconds during recovery.

STATISTICAL ANALYSIS

Exaggerated BP was defined as any one of the following: SBP at METpk > 195 mm Hg; Δ SBP > 60 mm Hg at 35% METpk; Δ SBP > 70 mm Hg at 65% METpk and Δ diastolic BP >10 mm Hg at METpk. Subjects were divided in two extreme groups based on their peak blood pressure results [high (200-246

mmHg) vs. low tertiles (138-176 mmHg)]. Statistical analyses were performed using SPSS for Windows, version 14.0 (SPSS Statistical Software, Chicago, IL). Data for descriptive characteristics and peak aerobic power are presented as mean \pm SD and independent t-tests were used to evaluate group differences in these measures. Forearm RH was compared between the two groups using repeated measures analysis of variance (ANOVA). Pearson correlation was used to examine the relationships between reactive hyperemia and blood pressures. Significance level was set a priori at 0.05.

RESULTS AND DISCUSSIONS

The subjects characteristics are shown in Table 1. These were young men, a little overweight and a low to medium exercise capacity.

Systolic blood pressure did not differ between groups at resting (Figure 1). Due to grouping criteria, it was normal to find that the high tertile group had a higher systolic blood pressure during and after exercise compared to the low tertile group (Figure 1).

During exercise no relationship was found between any of the exaggerated SBP indices and the measures of peripheral artery status by VOP. However, these findings are not consistent with others (Michelsen S, Knutsen Km, Stugaard M, Et Al. 1990), which reported that endothelium-dependent vasodilation is impaired in patients with exercise-induced hypertension and that the exaggerated SBP response to exercise is negatively correlated with endothelium function. These differences are possibly related to the fact that their subjects were older than ours (45 vs 22 years old). The proposed mechanism underlying an exaggerated increase in SBP includes a decreased aortic distensibility and an association between increased LV mass and increased peripheral resistance (Avolio Ap, Deng Fq, Li Wq, Et Al. 1985). A recent study (Ganten M, Krautter U, Hosch W, Et Al., 2007) showed a linear decrease of aortic distensibility with age in subjects without vascular disease that can explain the connection between exaggerated SBP and endothelial response in older individuals.

When individual SBP responses from peak exercise at the highest vs. lowest tertiles were contrasted, no differences in the VOP measures of vascular status were found (Figure 2). In young adults, impaired endothelial function seems to not play a role in exaggerated SBP during exercise. Some studies have shown that inflammation is associated with endothelial dysfunction (Hingorani Ad, Cross J, Kharbanda Rk, Et Al., 2000). Young individuals might need to be under a longer exposure of inflammatory cytokines in order for this mechanism to occur.

CONCLUSION: Regulations of blood pressure at rest and during exercise are complex and the mechanisms by which vascular status may contribute to risk of hypertension remain poorly understood, especially with respect to young vs. old adults.

Table 1
Characteristics of study's participants

	Male (N=50)
Age (years)	22.4 ± 2.6
BMI (kg/m ²)	27.7 ± 5.7
Total body fat (%)	24.3 ± 6.1
VO _{2peak} (ml · kg ⁻¹ · min ⁻¹)	28.8 ± 5.3

N, number; Kg, kilograms; BMI, body mass index;
VO_{2peak}, peak oxygen uptake; ml, milliliters; Min, minutes.

Figure 1

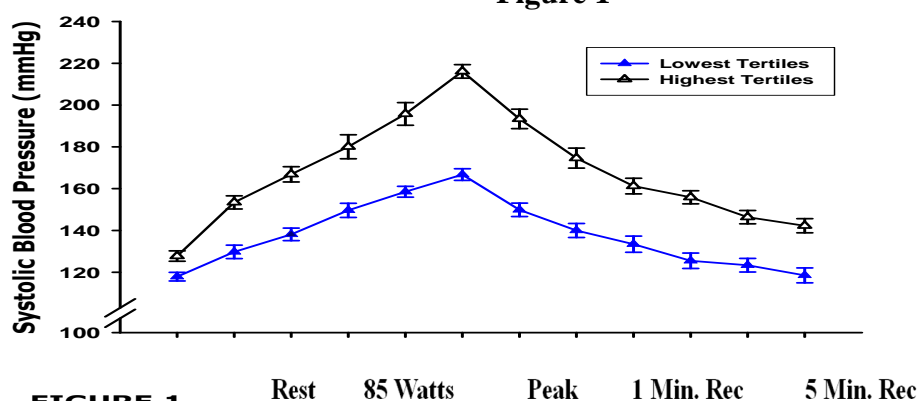
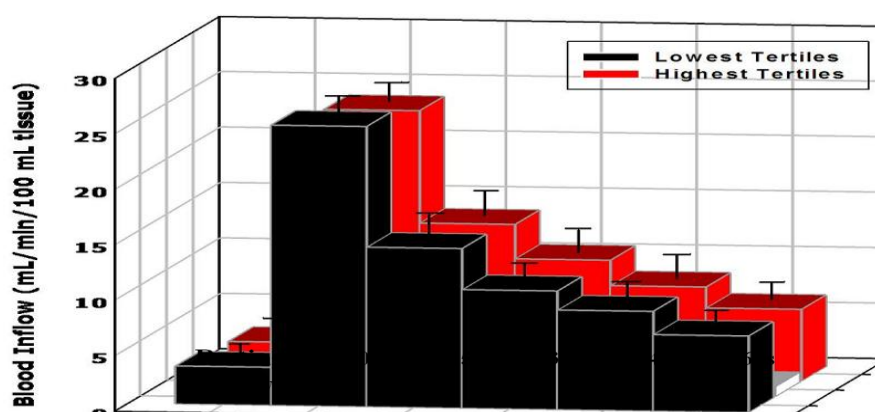


FIGURE 1 Systolic Blood Pressure responses from rest to peak and at the end of recovery. Data are in mean + SEM.

Figure 2

Forearm blood at rest and after ischemic occlusion. data are in mean ± SEM



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NEW COACHING METHODS IN THE ROMANIAN NAVAL PENTATHLON PERFORMANCE

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ABSTRACT

In this paper we try to present a model of training for the naval pentathlon. seamanship race it's the most important event in the naval pentathlon. the increase results for this event it's very important in ergonomic the total points to the naval pentathlon.

OBJECTIVE: The aim of this study is to increase the volume for seamanship race.

RESEARCH METHODS AND PROCEDURES: For naval pentathlon was allocate preparation and competition models specific all events. From this ideas 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.

RESULTS: To the finish of 29 weeks, we realize an increase of average for experiment group comparative with witness group.

DISCUSSION AND CONCLUSIONS: Increase the volume for seamanship race but not only demonstrated that methods were realist implemented in training lesson.

KEY WORDS: Lifesaving race, seamanship race, utility swimming race, amphibious cross-country

Introduction

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.

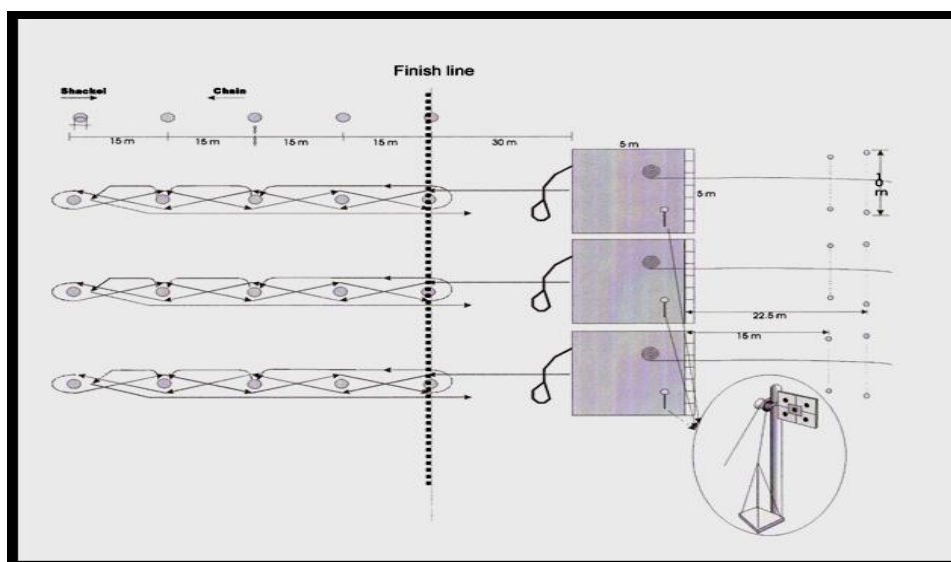
The team champion is determined by adding the individual results of a country's team. The regulations prescribe the way a CISM (International Council of Military Sports) military world championship shall be conducted. I'm present in the next principal characters about 4th event in naval pentathlon: seamanship race. This race shall be performed on land, in a working area of approximately 5 x 5 m (see sketch) and in a pulling boat on water, over a course of 270 m (picture 1). Seamanship race included 8 features (Naval Pentathlon Regulation, 2003)¹:

Feature No. 1 - Start. Starting line drawn on the ground. Competitors shall receive bag and pegs for feature No. 2 before the start of race is ordered.

Feature No. 2 - Work on a hanging platform approximately 2m from start (Boatswain's chair).

This feature is not performed by the female competitors. A small rectangular working platform (Boatswain's chair) which can be hoisted up a mast using a rope of 7 cm circumference and a pulley. A plate (size 50 x 40 x 5 cm) shall be fixed on the mast in a vertical position, with the bottom 6.00 m from the ground. In the plate five holes of about 4 cm diameter shall be marked in different colours. Five pegs 20 cm long and furnished with a stop or stop-ring 10 cm from the leading end and have a diameter of 3.5 cm. Each and all painted with one and each colour from the flag (see sketch). The competitor shall carry the 5 pegs and - if he wants - the bag. The competitor shall take his place on the platform (Boatswain's chair) and hoist himself up to the plate and put the pegs into the holes of corresponding colour.

Picture 1. Seamen ships area



Feature No. 3 - Hauling a cable. Cable of Manila or nylon with a circumference between 15 and 20 cm and 10.00 m long with one end fixed to the pontoon and with a bight (loop) of about 20 cm inside diameter in one end. With the exception of the end fixed to the pontoon, the remainder (loop) is in the water. The competitor shall haul in the cable in its full length and place the bight on the platform just behind the heaving (throwing) lines at feature No. 4. The bight of the cable may not be placed on any part of the heaving lines.

Feature No. 4 - Heaving lines. Three heaving or throwing lines of any length with one end weighted. A railing 1.00 m high. One floating marker 10.00 m in length moored parallel 22.50/15.00 m from the pontoon.

Competitors may not perform any portion of the bowline in the end of their lines. The tying end must be

free of knots or aids of any kind. Throw the heaving line over the shoulder from behind the railing. The heaving line must pass over and between the ends of the barrier. After the throw fasten the end of the heaving line to the bight of the cable of Manila with a bowline knot (see sketch). **Feature No. 5 - Slalom rowing around buoys.** On the water in a pulling boat. Rowing must start no more than approximately 20 m from the working area. A small boat, approximately 4 m in length, fitted with two oars and oarlocks. Five equal buoys shall be anchored 15.00 m from each other, without pennants, the maximum height being the same as the gunwale of the boats. The competitor will pass each of the five buoys four (4) times during two laps. In the first lap the competitor will row slalom and the competitor must pass the first buoy on the right side (looking at the buoys from the start) and the next (the

second one from the start) on the left side. When the competitors reach the fifth buoy, he passes it on the right side and turn 180° before going back. Thereafter the competitor shall continue slalom rowing back to the first buoy. When the competitors reach the first buoy, he shall pass it on the left side (looking at the buoys from the start) and turn 180° before starting lap No. 2. In the second lap (the way of passing the buoy is optional) the competitor have to move the chain from buoy No. 3 to buoy No. 4 and then pick up the shackle from buoy No. 5 and bring it to the finish line. **Feature No. 6 - Hauling of chain.** A chain fastened to buoy No. 3 with a shackle. The chain has a length of 4 to 5 m's and a weight of approximately 5 kg. The diameter of the chain links can regulate the weight of the chain. Ideal depth for this feature is 4 to 6 meters. (This is to ensure that the chain easily can be hauled aboard and run out during this event.) Loosen the shackle from buoy No. 3, haul the chain over to buoy No. 4 and fasten it thereto with the same shackle.

Feature No. 7 - Mooring. A shackle shall be fastened to buoy No. 5, the pin shall be fully screwed in and then unscrewed by one full turn. The shackle must be of the type used in mooring destroyers and should

weigh about 3 kg. Reach to the buoy and loosen the shackle. Take the shackle and pin in to the boat and bring it to the finish line. After completing the race the competitor must show the shackle and pin to an official in the marina.

Feature No. 8 - Rowing and Finish. The finish line is determined by the line of all buoys No. 1 and is infinity long. Row until any part of the boat reaches the finish line.

Methods

For naval pentathlon was allocate preparation and competition models specific all events. From this ideas 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. The structure this macro cycles present in table nr.1.

Table nr 1. The training model for Romanian naval pentathlon team in 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)
Obstacle race	Nr. hour total obstacle race (weeks).	4	3	5	4	2	
	Total hour/ mezzo cycle	16	18	70	12	4	120
Lifesaving swimming race	Nr. hour total lifesaving race (weeks).	3	4	4	3	2	
	Total hour/ mezzo cycle	12	24	56	9	4	105
Utility swimming race	Nr. hour total utility swimming race (weeks).	3	2	3	4	1	
	Total hour/ mezzo cycle	12	12	42	12	2	80
Seamanship race	Nr. hour total seamanship race (weeks).	4	4	5	4	2	
	Total hour/ mezzo cycle	16	24	70	12	4	126
Amphibious cross-country race	Nr. hour total amphibious cross-country race (weeks)	3	4	2	3	2	
	Total hour/ mezzo cycle	12	24	28	9	4	77

RESULTS

In first part of macro cycles we testing witness group and experiment group at all the moments that included seamanship race. To the finish of 29 weeks,

we realize an increase of average for experiment group comparative with witness group. That thing we present in next table. The model of macro cycles was adapted by W.Maglissho,2003².

Table nr. 2 Comparative analyses in average characteristic seamanship event

Initial testing			
Nr.	Parametric	$\bar{X} \pm m$	
		Witness group	Experiment group
1	Work on a hanging platform (sec.)	125,50 \pm 0,53	120,50 \pm 0,58
2	Hauling a cable (sec.)	13,00 \pm 2,69	11,75 \pm 2,11
3	Heaving lines (sec.)	18,00 \pm 3,08	16,00 \pm 2,18
4	Slalom rowing around buoys (sec.)	184,25 \pm 1,03	174,25 \pm 1,73
5	Hauling of chain (sec.)	43,50 \pm 0,85	38,50 \pm 0,66
6	Mooring (sec.)	22,00 \pm 1,12	21,50 \pm 0,72
7	Rowing and Finish (sec.)	45,25 \pm 2,34	40,75 \pm 1,35

Table nr. 3

Final testing			
Nr.	Parametric	$\bar{X} \pm m$	
		Witness group	Experiment group
1	Work on a hanging platform (sec.)	118,50 \pm 1,53	95,50 \pm 0,33
2	Hauling a cable (sec.)	11,00 \pm 1,89	8,75 \pm 1,17
3	Heaving lines (sec.)	16,00 \pm 2,08	11,00 \pm 2,16
4	Slalom rowing around buoys (sec.)	168,25 \pm 2,03	134,25 \pm 0,83
5	Hauling of chain (sec.)	39,50 \pm 0,15	29,50 \pm 0,60
6	Mooring (sec.)	18,00 \pm 2,12	17,50 \pm 0,52
7	Rowing and Finish (sec.)	38,25 \pm 1,34	35,75 \pm 0,95

DISCUSSION AND CONCLUSIONS

Increase the volume for seamanship race but not only demonstrated that methods were realist

implemented in training lesson. That thing we present in next graphic.

Graphic nr 1. Dynamics results features in seamanship race



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STRENGTH TRAINING FOR CHILDREN AND ADOLESCENTS IS IT BENEFICIAL?

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ABSTRACT

Strength Training - Uses resistance methods to increase ones ability to exert or resist force. Appropriate strength training programs have no apparent adverse effect on linear growth, growth plates, or the cardiovascular system. Closely supervised resistance training programs can significantly improve the muscle strength of children with no adverse effects on bone, muscle, or connective tissue. **Research Methods:** Free weights, the individuals own body weight, machines, other devices (elastic bands, medicine balls).

KEY WORDS: strength training, children, adolescents, benefits, risk factors

What is strength training?

Strength Training - Uses resistance methods to increase ones ability to exert or resist force.

The sports performance can be improved in young athletes by increasing muscular strength with strength training.

Reasons for participating in strength and conditioning training

Promotion of a healthy lifestyle

Physical well-being is also a state of mind, and physical exercise commonly facilitates the incorporation of other aspects of a healthy lifestyle into a comprehensive regimen. It can also aid in body composition and the loss of body fat, countering childhood obesity.

Physical well-being is also a state of mind, and physical exercise commonly facilitates the incorporation of other aspects of a healthy lifestyle into a comprehensive regimen. It can also aid in body composition and the loss of body fat, countering childhood obesity.

Injury Prevention

Studies by the American College of Sports Medicine show that training may prevent injury from occurring during the sports season.

Since kids are at risk of repetitive injury and physical overuse, body strengthening and education can prevent injuries during and after game time. It also gives children a basic level of fitness by using a wide range of exercises to promote flexibility and coordination, decreasing the number of injuries.

Improvement of sports performance, physical fitness, and mental self-image

Most importantly, a child's self esteem, self confidence, mental discipline, performance, and coordination can all be expected to improve as a result of strength and conditioning training

Resistance to life-threatening conditions

Exercise and proper training also have a positive effect on a child's cardiopulmonary/cardiorespiratory status and bone mineral density, helping to reduce the risk of serious illnesses in adulthood, such as heart disease and osteoporosis.

Methods

- Free weights
- The individuals own body weight
- Machines
- Other devices (elastic bands, medicine balls)

All of these provide resistance

Photo nr. 1



Misconceptions

Commonly confused with the sports of weight lifting, power lifting and body building.

Weight lifting and power lifting potentially have more serious injuries associated with them than does strength training.

Types Training Activity

- **Core strengthening**
- **Proprioception**
- **Neuromuscular Training**
- **Plyometrics**

Core Strengthening

Every movement you do comes from your core – your rectus and transverse abdominus, deep internal stabilizers, back extensors, back stabilizers, and trunk rotational muscles are all part of your muscle core.

Core Strength (Cont.)

Begin on a stable surface and progress to unstable surfaces, such as training with a physioball to improve balance.

Proprioception

This training teaches athletes how to instinctively detect joint position and movement in space and to respond appropriately to variations in forces received either during or prior to initiation of a deleterious, or harmful, movement. Much of this training involves balance conditioning, and as the athlete's skill improves, more stimuli are needed to continue improvement in this area.

For example, a gymnast does a back tuck in the air on a balance beam just a few inches wide. There is less than a second for her body to know where to land, and proprioception enhances her body's ability to determine how to land with two feet safely on the beam.

Neuromuscular Training

Neuromuscular training teaches athletes to make the proper decisions in order to avoid injury. It enhances unconscious motor responses during movements, especially when jumping, landing, cutting, pivoting, hopping, and decelerating. Training this continual feedback control system improves one's ability to utilize proprioceptive information.

Plyometrics

Plyometrics involve the rapid stretching of a muscle (eccentric phase) and the rapid shortening of the same muscle (concentric phase). Using this technique, the nervous system is conditioned to react more quickly to the stretch-shortening cycle, thereby increasing the speed of movement and improving power production.

When plyometric activity is incorporated into their regimen, athletes improve their reaction time, and their overall strength improves -- they learn how to jump and leap higher, run faster, and throw farther. It also improves hand-eye coordination.

Polymeric Activitie

- **Rope Jumping**
 - **Hopping**
 - **Skipping**
 - **Box Jumps**
- Key is stretch and contraction!**

Common games and activities such as hopscotch, rope jumping and jumping jacks can also be characterized as plyometrics

Every time the feet make contact with the ground the quadriceps are subjected to the stretch-shortening cycle.

In fact, plyometrics are a natural part of most movements, as evidenced by the jumping, hopping and skipping seen on any school playground.

The Facts

- Appropriate strength training programs have no apparent adverse effect on linear growth, growth plates, or the cardiovascular system.
- Closely supervised resistance training programs can significantly improve the muscle strength of children with no adverse effects on bone, muscle, or connective tissue.
- Contrary to prior understanding, new studies have shown that growth plates (the areas of primary growth at the ends of longer bones) in prepubescent children are not at high risk of epiphyseal fractures when the training adheres to these guidelines. Strength and conditioning training can actually enhance bone growth; the greatest amount of bone formation occurs during childhood, and strength training can serve to create stronger bones if done correctly and in the proper setting.

Risks of Strength Training

- Muscle strains 40-70% of all injuries.
- Hand, low back, and upper trunk are commonly injured areas.

Things you should be aware of before beginning strength training

Caution should be used for certain young athletes that have:

- Preexisting hypertension.
- Received chemotherapy.
- Cardiomyopathy (hypertrophic cardiomyopathy).
- Pulmonary hypertension.
- History of seizures.

Safety Guidelines

- A qualified individual (physical therapist, Certified Strength and Conditioning Specialist, or athletic trainer) must be present.
- There must not be too many other kids at the same session. The best ratios for training are one-on-one, -two, or -three, and there should never be more than three to four children to a trainer, especially in sessions for beginners.
- Children should wear loose clothing and sneakers to train.
- Set reasonable goals for each child, based on his or her desires and ability.
- Perform aerobic exercise for 10 minutes before training begins.
- Use different modes of training, including free weights, size-appropriate weight machines, body weight exercises, elastic bands, and medicine balls.
- Start with six to eight exercises, 10 to 15 repetitions per set at a low weight level. Choose weight with which a child can succeed. Adults can spot children to help them finish a set.
- Stress proper technique, rather than increased weight.

- Rest between sets, and complete one to three sets, based on child's needs.
- Training should begin at an appropriate level, with adequate rest between exercises, to minimize injury and maximize fun. Proper form will decrease the risk of a soft-tissue injury.
- Encourage use of workout cards, and review progress at each session.
- Stress proper nutritional guidelines including the importance of calcium in a child's diet.
- Train in two to three sessions spread throughout the week.
- Kids should use low weights and high repetition, with a qualified supervisor correcting their form and teaching them the proper technique. With proper early direction, children learn safety standards that can benefit them throughout their lives.
- The best results are seen with an 8-12 week program.

Conclusions: Training should begin at an appropriate level, with adequate rest between exercises, to minimize injury and maximize fun. Proper form will decrease the risk of a soft-tissue injury.

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EMOTIVENESS AND IMPULSIVENESS AT SCHOOL. OBSERVATION AND EVALUATION PATHS

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ABSTRACT

Impulsiveness and emotiveness are often confused and overlapped between them. Instead, who has a daily direct contact with subjects in the years of growth must be able to properly recognize and evaluate the impact they have on the didactic environment and to well know the most effective methods for structuring a suitable emotional expertise.

KEY WORDS: emotiveness, impulsiveness, schoolchildren

EMOTIVENESS AND IMPULSIVENESS

If we consider that *emotiveness* is more connected to the environmental factors than impulsiveness and that *impulsiveness* brings the subject to express with remarkable behavioural immediateness

his biological contingent conditions (physical needs), through rigid and well tested schemes, it will be productive to study the subject in specific playful and social situations. In fact, the emotiveness control is intended as the person's capability of addressing his own behaviour toward the prefixed aim or goal,

bypassing various emotional disturbances which could intervene in that moment. So, observing the subject while he is facing a particular task (problem solving) and how he behaves and reacts before eventual distractions duly pointed out and produced.

In consideration of all this, we remind the main organic manifestations of an emotional state: pallor, sweating, modification of the respiratory rhythm, tremor, visceral phenomena, escape, etc.

Instead, the observation of impulsiveness control will deal with the skill of delaying the fulfilment of physical needs, such as hunger and thirst, or of social emotional impulses; in other words, the subject's skill of controlling the irrational and instinctive impulses generated by emotional situations.

Typical behaviours of particular emotive subjects

- Changes of mood depending on particular emotional environmental stimulus or on personal emotional situations which could escape the observer for their hidden nature
- The child seems to be nervous;
- He is easily irritable and touchy;
- He exaggeratedly gets excited when speaking, intensifies the tone, the colour, and also the rhythm of his voice as, on the contrary, he speaks with a subdued and unsteady voice and he even stammers. Strong and superlative terms for trying to mitigate his irritated state are not unlikely;
- Written production is often expressed in a straight and confidential form, rich in adjectives and images;
- Written production often does not reflect the reality, but embellishes and amplifies the contents for making them more interesting;
- A handwriting alteration is likely;
- A spontaneous drawing is characterised by big colour spots, vivacious tones and strong contrasts;
- During playful activities he can try to change the rules of the game and even to cheat.

Typical behaviours of scarcely emotive subjects

- The child does not show changes of mood as a consequence of unexpected events;
- He is very patient in waiting an expected event;
- Shows indifference and sometimes detachment from the surrounding reality;
- The above mentioned attitude is highlighted by the tone of his voice, even always expressed with a uniform tone and with neutral "colours";

- He is objective when telling histories and he does not modify the contents by showing, sometimes, few imagination and interpretative involvement;
- He does not make confidences and he is almost impersonal and cold in his relationships;
- When playing, he respects the rules and, when defeated, he does not feel a particular discomfort and shows a good capability of losing.

Finally we can add that the control of *emotiveness* and *impulsiveness* is lower in the child than in the adult.

OBSERVATION PROJECT

Here below follows and hypothesis of observation project of the above described dynamics, practicable in an educational context such as nursery or primary school.

PROJECT GOALS

On the recognized positive influence of EMOTIONAL and FANTASTICAL activities on various dynamic aspects of development, such as *attention, memory, learning*, etc. a didactic project has been proposed, aimed to favours the children's adoption of suitable competences and of their "managerial/balancing" resources.

The project is based on an interdisciplinary didactic activity that deals with a double contribution provided, on one hand, by curricular teachers and, on the other hand, by Physical Education teachers of the schools involved, and that considers the classrooms and gyms of reference as convenient places for its realization.

METHOD OF INTERVENTION

The adopted method will be the game, both for the "theoretical" part, in the classroom, and for the expressive- motorial part, in the gym. The approach to the oral knowledge of *emotions* will be, in fact, driven and mediated by an activity carried out under a playful form going, for example, from telling stories to watching material pertaining to fables, to discussing in "circle" of them; from realising masks, cartoons and other, to representing and painting all the studied emotional situations. In the same way, the activity carried out in the gym will be oriented toward creative dramatization, symbolic games, role games, expressive and play-motility games, etc. A particular attention will be paid to illusionistic games, where children will use their fantasy for changing the surrounding reality (and

the conflict situations), and for elaborating various solutions while playing.

TIMES

The project, composed by two different activities not separated between them, can be carried out in two different moments.

The first one, dedicated to know the single emotions (three positive, *surprise, joy, love* and three negative, *sadness, angry, fear*) has expected times of two weeks each, for a total of about three months. This choice is influenced by the fact that, usually, children attend the gym just once a week, so two occasions are to be considered as the minimum limit for its effective realization.

Obviously the possibility of a more regular access to the motorial activity would favour the project under the didactic and managerial point of view.

At present it is necessary to indicate, for the activities in the classroom (at least two or three a week), that at least one of them would be done the same day of the gym activity, and before it. Furthermore, the curricular teachers will punctually repeat the characterising issues (revision), in itinere, studied in every emotion, so to avoid that children will forget their specificities.

The second moment, instead, will be composed by an activity in the classroom and in the gym, where all the various emotions will be compared one another and will be played. The expected times are constituted by all the remaining scholastic year

Instruments and Materials

The project does not contemplate the use of particular supports or of materials different from those already used by every nursery or primary school such as colours, drawing paper, cardboards etc more audiovisual instruments and videotapes.

Programmes

Programmes are mainly focused on two specific development fields: The *behavioural* and the *cognitive* field.

The first is intended to provide children with a correct knowledge of the various expressive methods of *emotions*, that is to say the capacity of recognizing on themselves and on others various emotional states.

So, an important meaning will be therefore attributed to *Non Verbal Communication* in general, indicating all the expressive and perceptive channels which originated from the body experience, further than from *fantasy*, since they are aware that children use it whenever they want to qualitatively change an undesired affective state in a more favourable one (reduction of aggressiveness through the fanciful activity)

Instead, the second field will take into account some basic assumptions:

- “*Emotions influence the expressive behaviour. But also: Expressive behaviours can influence emotions*”.
- << *The free manifestation of an emotion through external signs intensifies it. On the other side, the possible suppression of all the external manifestations moderates our emotions* >> Darwin.
- *State Dependent Memory: Memory is better when the mood dominating during recollection corresponds to the mood that dominated during learning* (management and control of emotiveness.)

Verifications

For a proper verification and evaluation of the activities carried out, it will be convenient to detect some aspects of children’s social and psychomotor behaviour at the beginning and at the end of the activity, through a semi structured observation protocol.

Semi structured observation protocol

Hypothesis of work in the Classroom

[every Emotion supposes an intervention (6 emotions)]

1. Tell a story with evident elements which characterise the analysed Emotion;
Phase of the circle and debate: Associated colours, synonymous, identified people and roles, involvement balance etc.;
2. Present some masks representing the various emotions;
Among them, find the “one of the day”;
Find the opposite one (find the emotional features of its diversity);
Present also “sectional” masks, without eyes and mouth;
Let the children choose eyes and the mouth, among various ones, suitable to the analysed Emotion;
Present “incongruous” masks (ex.: “smiling” eyes, “angry” mouth) and ask the children to correct them according to the analysed Emotion;
Build some masks.
Invent some stories and represent them by using the masks realised.
3. Graphic representation of the emotion;
Draw and colour a face representing the Emotion;
Make a dynamic drawing¹ “illustrating” of the Emotion;
Draw some objects which illustrate that Emotion;
Reporting and discussion of the realised tests;

¹ By *dynamic* we mean a drawing representing a scene with one or more participants and with various related graphic subjects.

Hypothesis of work in the Gym

The gym will provide various *reachable* places: “beneath”, “above”, “behind”, “in the centre” ... furthermore, it will describe various areas characterised by an emotion. (see point five. This repartition will be useful when all the emotions will be “examined”).

1. Body representation of the Emotion;

Freely walk the Emotion by occupying all the space;

Walk the Emotion by expressing a different emotion on the face (opposite);

“Play” the Emotion while standing still. Even the contrary emotion;

Let the children choose a *reachable* space where the Emotion can be adopted;

2. Mime an emotion by wearing a paper bag on the head. The other children must guess the emotion;

3. Theatre game (body);

4. Emotional Path Game;

5. Emotion projected on the objects.

“Meaningful” objects and “symbolic” objects.

In both situations, classroom and gym, and for every child, the single behavioural “answers” will be observed, described and reported by the trainee on a specific journal, so that during the interpretative phase, a direct comparison between the two experiences, the physical one and the most *intellectual* one in the classroom, will also be possible. The specific aim of the observation will be of comparing eventual dissonances between the two expressive methods, and in particular the expressive/physical involvement expressed during the dramatization.

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DOES PARTICIPATION MOTIVATION OF YOUTH SOCCER PLAYERS CHANGE WITH REGARD TO THEIR PERCEIVED ABILITY?

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ABSTRACT

Understanding the motives for youth sport participation has become important issue for sport practitioners and researchers in the last decade. According to Harter's competence motivation theory, the perceptions of competence associated with successful performance are critical determinants of subsequent motivation to participate. In other words, individuals who perceive themselves as competent in sports are more likely to continue their participation, while those low in perceived physical competence will likely discontinue participation in the particular sport.

OBJECTIVE: The purpose of this study was to determine participation motives of youth soccer players and examine their participation motives with regard to their perceived ability levels.

RESEARCH METHODS AND PROCEDURES: 147 youth soccer players (Mage = 15.06 ± 2.05 years) voluntarily participated in this study. "Participation Motivation Questionnaire (PMQ)" and "Sport Competence subscale of Children and Youth Physical Self-Perception Profile" were administered to all participants. 147 soccer players were classified as low perceived sport ability and high perceived sport ability groups based on the median scores of sport competence subscale.

RESULTS: Analysis indicated that high perceived ability group was more motivated by achievement/status reasons than low perceived ability group ($t = 3.13$; $p < 0.01$). However, no significant differences were found in other PMQ subscales between soccer players in low and high perceived ability groups ($p > 0.05$). 20.3 % of the youth soccer players higher in perceived ability rated "competing at higher level" as the most important participation motive for them. On the other hand, 33.8 % the youth soccer players lower in perceived ability rated "improving skills" as the most important reason for their sport participation.

DISCUSSION AND CONCLUSIONS: Based on the mean ratings of each of the 30 participation motives, youth soccer players in high and low perceived ability groups had the highest mean scores on "like to win" and "improve my skills", respectively.

KEY WORDS: participation motivation, youth soccer players, perceived ability

INTRODUCTION

Understanding the motives for youth sport participation has become important issue for sport practitioners and researchers in the last decade. Gould suggests that this research area has engaged the interest of investigators because the accumulation of knowledge through these efforts will enable youth sport leaders and coaches to design sports program and athletic experiences for participants that will fulfill the athletes' needs and contribute positively to their personal development (cited in Ryckman & Hamel, 1993).

In the effort of determining participation motives in sports, Gill, Gross, and Huddleston (1983) developed a measurement tool, namely *Participation Motivation Questionnaire (PMQ)*, to study these motives of children in the summer sport school. In their study with youth participants, it was found that the most important reasons for participating were to improve skills, have fun, learn new skills, challenge, and to be physically fit.

In the other studies using PMQ, researchers examined participation motives of different samples. Gould, Feltz, and Weiss (1985) found that the swimmers rated fun, fitness, skill improvement, team atmosphere and challenge as the most important motives for participation. In gymnasts Klint and Weiss (1987) stated that the top ten reported reasons were competence-related motives (learn new skills, compete at higher levels, improve skills), fitness-related motives (get in shape, stay in shape, be physically active), challenge, and fun. In the recent study of Turkish children in summer sports schools, Oyar, Aşçı, Çelebi, & Mülazımoğlu (2001) found that the most important five reasons for them were compete at higher levels, improve skills, being physically fit, learn new skills, and fun.

Some researchers have been focused on identifying individual differences in participation motivation such as gender, perceived ability. Concerning with perceived ability, Harter's (1978) competence motivation theory was used to explain participation motivation. According to Harter's competence motivation theory, the perceptions of

competence associated with successful performance are critical determinants of subsequent motivation to participate. In other words, individuals who perceive themselves as competent in sports are more likely to continue their participation, while those low in perceived physical competence will likely discontinue participation in the particular sport.

Some researchers (Gould et al., 1985) found no differences in the importance attached to various motives between high and low ability swimmers, while Klint and Weiss (1987) found some differences between gymnasts high and low in perceived physical ability. Klint and Weiss (1987) found that athletes high in perceived physical ability cited reasons related to skill development as being more important motives for participating in sports. Ryckman and Hamel (1993) also reported similar findings in the young athletes involved in organized team sports.

As can be seen from the literature, there are some inconsistencies in the findings concerning perceived physical ability and participation motivation. Thus we aimed reexamine participation motives of youth athletes with regard to perceived ability levels. In addition, in the Turkish literature there is no research to study participation motives of the athletes involved in competitive sports. Thus, the second purpose of this study was to determine participation motives of youth soccer players.

METHOD

Participants: 147 youth soccer players ($M_{age}=15.06$, $SD=2.05$ years) with approximately five years of sport experiences ($M=5.31$, $SD=1.99$ years) voluntarily participated in this study.

Instruments:

Participation Motivation Questionnaire (PMQ): PMQ was developed by Gill, Gross, and Huddleston (1983). It consists of a list 30 possible reasons for participating in sports and includes 8 subscales named Skill Development, Team Affiliation, Fun, Achievement/Status, Friendship, Energy Release, Fitness, and Miscellaneous. Participants were asked to

indicate whether each reason was very important (coded as 1), somewhat important (coded as 2), or not at all important (coded as 3) to them for participating in sport. The evidence of reliability and validity of PMQ for Turkish sample were determined in a study of Oyar et al. (2001).

Children and Youth Physical Self-Perception Profile (CY-PSPP, Whitehead, 1995): CY-PSPP is a 36-item inventory which has six scales designed to measure physical self-perception in four sub-domains of physical self-worth (sport/athletic competence, attractive body adequacy, strength competence, and condition/stamina competence), global physical self-worth and global self-worth. Each scale has six items which are scored using a four point structured alternative format. In this format, respondents are first asked to decide which side of contrasting description is most like them. They are subsequently asked whether the description they selected is "sort of true" or "really true" for them. Items' scoring ranges from 1 to 4, and subscale scores are reported as the mean of the six items (Aşçı, Eklund, Whitehead, Kirazcı and Koca, 2005). Only sport/athletic competence subscale of CY-PSPP was used in this study. The reliability and validity evidences of the CY-PSPP for Turkish sample were obtained in recent studies carried out by Aşçı et al. (2005).

Procedure: Both instruments were administered to all participants in the classroom settings. Researchers provided verbal and visual information on how to respond to items in each questionnaire.

Data Analysis: Youth soccer players were classified as low ($n = 68$) and high ($n = 64$) perceived sport ability groups based on median split of sport/athletic competence values. Descriptive statistics and t test were used to analyze the data.

RESULTS

Table 1 presents descriptive statistics and t-test results of PMQ subscales for low and high perceived ability groups.

Table 1. t-test results and descriptive statistics of PMQ subscales for low and high perceived ability groups.

PMQ subscales	Low perceived ability group (n = 68)		High perceived ability group (n = 64)		t
	M	SD	M	SD	
Energy release/fitness	6.60	1.53	6.45	1.27	0.58
Achievement/status	6.47	1.63	5.71	1.05	3.13**
Team affiliation	4.39	0.81	4.17	0.42	1.90
Friendship	4.42	1.45	4.09	1.16	1.40
Fun	6.13	1.75	5.98	1.26	0.56
Competition	3.73	1.01	3.48	0.81	1.53
Skill development	3.10	0.42	3.12	0.38	0.33
Movement	2.57	0.93	2.53	0.73	0.28

** p < 0.01

As can be seen Table 1, there was significant difference in achievement/status subscale of PMQ between low and high perceived ability groups ($t=3.13$; $p < 0.01$). This finding indicated high perceived ability group was more motivated by achievement/status reasons than low perceived ability group. However, no significant differences were found in other PMQ subscales between youth soccer players in low and high perceived ability groups ($p > 0.05$).

Mean ratings of each item were used to determine the relative importance of the 30 participation motives/reasons. Mean importance ratings were calculated with very important scored as 1, somewhat important as 2, and not at all important as 3. For both groups, the five highest mean importance ratings of 30 reasons are presented Table 2 and 3.

Table 2. The five highest mean importance ratings of low perceived ability group.

PMQ items	M	SD
I want to improve my skills	1.01	0.12
I want to compete at higher level	1.03	0.17
I want to be physically fit	1.03	0.24
I want to stay in shape	1.04	0.21
I like the team spirit	1.04	0.21

Table 3. The five highest mean importance ratings of high perceived ability group.

PMQ items	M	SD
I like to win	1.00	0.00
I want to compete at higher level	1.02	0.12
I like being on a team	1.02	0.13
I want to stay in shape	1.02	0.13
I like the teamwork	1.02	0.13

Low perceived ability group rated improvement skill the highest rating whereas high perceived ability group rated like to win as the first in importance. Both groups rated compete at higher level as second in importance.

In addition to rating the importance of each item, athletes were asked to indicate the one reason from the list that was the most important reason for them. 20.3 % of the youth soccer players higher in perceived ability rated "competing at higher level" as the most important participation motive for them. On the other hand, 33.8 % the youth soccer players lower in perceived ability rated "improving skills" as the most important reason for their sport participation. These findings were parallel to the importance ratings of both groups.

DISCUSSION & CONCLUSION

This study intended to determine participation motives of youth soccer players and examine their participation motives with regard to their perceived ability levels.

Analysis revealed significant differences between high and low perceived ability groups on achievement/status subscale of PMQ. High perceived ability group was more motivated by achievement/status reasons than low perceived ability group. However, no significant differences were found in other PMQ subscales between youth soccer players in low and high perceived ability groups. These

findings were dissimilar with the results of the study (Ryckman & Hamel, 1993) which reported that athletes higher in perceived physical ability considered skill development, team affiliation, and having fun as more important reasons for their participation in sports than athletes lower in perceived physical ability. In the study of Klint and Weiss (1987) was also found similar results. Specifically, those who were high in perceived physical competence rated skill development as a more important reason for participating than did low perceived physical competence athletes. The differences between previous studies and the present study could be attributed to the differences in sample and instruments used to measure perceived physical competence.

Descriptive statistics indicated that low perceived ability group rated improvement skill the highest rating whereas high perceived ability group rated like to win as the first in importance. Both groups rated compete at higher level as second in importance. In addition to rating the importance of each item, when athletes were asked to indicate the one reason from the list that was the most important reason for them, 20.3 % of the youth soccer players higher in perceived ability rated "competing at higher level" and 33.8 % the youth soccer players lower in perceived ability rated "improving skills" as the most important reason for their sport participation. These reasons are the items constituted skill development subscale. This

finding is parallel to studies (Gould et al., 1985; Klint & Weiss, 1987; Oyar et al., 2001) reported skill development as one of the most important reasons for the athletes. This finding of present study suggests that organizers of youth sport programs and coaches emphasize especially opportunities for the development and improvement skills.

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METHODS OF MEASURING PHYSICAL EFFORT TO PATIENTS SUFFERING FROM CARDIOVASCULAR DISEASES

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ABSTRACT

The following project makes part of the latest research in preventing and improving cardiovascular diseases. according to the most recent oms statistics, Romania occupies the first place concerning the death rate caused by the cardiovascular diseases. Romania is also number one concerning the mortality caused by both the ischemic coronary disease and the vasculocerebral accident. However, many deaths could be avoided given that 80-90% of the persons who die as a result of myocardial infarct have at least one major risk factor influenced by the change of lifestyle or therapy. The present project tackles the problem of treating the cardiac patients and the implementing of adapted physical exercises in the treating system. The project relies on many scientific researches developed in our country and abroad aiming at practising experimentally the adapted physical exercises by taking into account the categories and states of disease, age, physical abilities, various aspects specific to each patient. The importance of the project will consist in conceiving programmes that will have in view selecting, levelling, dosing and organising of physical exercises. These programmes will cover a large area of sports branches and will adapt to each individual's needs.

OBJECTIVE: The objective of this research is to elaborate a guideline of prescribing the practise of the physical exercises so necessary to both the patients and the specialists in medicine and physical education and sport.

KEY WORDS: cardiovascular disease, prescription, measurement, physical activities, amelioration.

IMPORTANCE AND RELEVANCE OF THE SCIENTIFIC CONTENT

The presentation creates the research referential; it will demonstrate the project manager's degree of information documentation

The first International Symposium regarding physical effort, fitness and health was held in 1988 in Toronto, Canada. It required a critical examination of

all the proof referring to the relationship between these factors with a view to determining the experts in the domain to reach a complete agreement. Afterwards, it became customary to organize such symposiums during which there have been recognized the benefits of physical efforts upon man's health both by the specialists and the international organizations, such as The World Health Organization, The International

Federation of Sports Medicine, The American College of Sports Medicine, and The European Council. There have been admitted the sanogenetical effects of the motility activities on the physical and psychological state but also the positive influences over some categories of diseases, such as endocrinological affections, cancer, respiratory diseases and mainly cardiovascular diseases. The current medical knowledge dates from the 17th century when the English physician William Harvey, observing his own patients and carrying out experiments on animals, determined the real functionality of the heart and synthesized his research in his first book. It has been considered for a long time that a great and sustained physical effort makes the heart bigger, having negative effects, but this has been contradicted later on when physiologists in the field proved that physical exercises definitely lead to the heart getting bigger, but this having a positive effect by strengthening its muscles and fortifying the physical resistance. Other recent research has demonstrated the relationship between the lack of physical activity and heart diseases (*The American College of Sports Medicine*, 1975, 2002, *The Division of Adult and Community Health*, *The National Center for Chronic Disease Prevention and Health Promotion*, *The Centers for Disease Control and Prevention*, Atlanta, Georgia, 2007). In the U.S.A. the children with cardiac problems are protected by the Public Law 94-142 and identified as handicapped individuals. This certifies that they benefit from a special education, physical education included, where the teacher and the medical staff have to cooperate, to plan and to set specific objectives for each pupil. Most research studies which are closely connected with the role of physical exercises made upon children with heart diseases deal with aspects of describing heart diseases without mentioning anything about the specific aspects of making physical exercises: (*American College of Sport Medicine- Guidelines for graded exercise testing and exercise prescription*, Philadelphia, 1980, *American Heart Association – If your child has a congenital heart defect*, New York, 1970, Corbin C. - *Cardiovascular fitness of children*, Dubuque, IA, 1980, Cummings G.R.- *Children with heart disease*. In J.S. Skinner- *Exercise testing and exercise prescription for special cases*, 1987, Longimur, P. et.al.- *The benefits of a post operative exercise program for children with congenital heart disease*, *Clinical Investigative medicine* 5 (45). John M.Dunn , Hollis F.Fait –*Special Physical Education*, Dubuque, Iowa, 1995, *American Heart Association-Exercise Standards for Testing and Training* 2001, Plantiga, Y. in – *Physical fitness and regular exercises reduces a major predictor of cardiovascular disease /Medical researches news*, 2005). It has been proved the beneficial effect of practicing physical activities in improving cardiovascular diseases, regardless of sex and age as it was pointed out in the following research studies: Blair

SN, Goodyear NN, Gibbons LW, et al. *Physical fitness and incidence of hypertension in healthy normotensive men and women*. *JAMA*. . 1984; Morris CK, Myers J, Froelicher VF, et al. *Nomogram based on metabolic equivalents and age for assessing aerobic exercise capacity in men*. *J Am Coll Cardiol*. . 1993; Fleg JL, O'Connor F, Gerstenblith G, et al. *Impact of age on the cardiovascular response to dynamic upright exercise in healthy men and women*. *J Appl Physiol*. . 1995; Barry HC, Eathorne SW. *Exercise and aging: issues for the practitioner*. *Med Clin North Am*. . 1994; Abbott RD, Rodriguez BL, Burchfiel CM, et al. *Physical activity in older middle-aged men and reduced risk of stroke: the Honolulu Heart Program*. *Am J Epidemiol*. . 1994; McAuley E, Courneya KS, Rudolph DL, et al. *Enhancing exercise adherence in middle-aged males and females*. *Prev Med*. . 2004; Kallinen, M., Suominen, H., Vuolteenaho, O. and Alen, M. (1998) *Effort tolerance in elderly women with different physical activity backgrounds*. *Medicine and Science in Sports and Exercise* 30, Kallinen, M., Kauppinen, M., Era, P. and Heikkinen, E. *The predictive value of exercise testing for survival among 75-year-old men and women*. *Journal of Sport Science and Medicine*. RJ Shephard – *what is the optimal type of physical activity to enhance health?*, *British Journal of Sports Medicine*, Vol 31.

There have been emphasized the preventive effects of the physical activities which trigger a state of well-being for the potential cardiovascular patients: Bouchard C, An P, Rice T, et al. *Familial aggregation of VO₂ max response to exercise training: results from the HERITAGE Family Study*. *J Appl Physiol*. . 1999; Balady GJ, Weiner DA, McCabe CH, et al. *Value of arm exercise testing in detecting coronary artery disease*. *Am J Cardiol*. . 1985 Pina IL, Balady GJ, Hanson P, et al. *Guidelines for clinical exercise testing laboratories: a statement for healthcare professionals from the Committee on Exercise and Cardiac Rehabilitation, American Heart Association*. *Circulation*. . 1995; Bruce RA, DeRouen TA, Hossack KF. *Value of maximal exercise tests in risk assessment of primary coronary heart disease events in healthy men: five years' experience of the Seattle heart watch study*. *Am J Cardiol*. . 1980

Douglas Seals refers to the arterial ability in expansion, mainly the blood vessels which transport the blood from the heart. This, as well as the physical exercise, is a necessary thing as a response to factors. Young, middle-aged and old people who keep running have the ability to dilate their vessels.

For sedentary people, this ability disappears with age, but a moderate physical exercise makes this vascular ability return, regardless of the length of time that the person was sedentary. This is an encouraging situation not only because one of the consequences of ageing which is related to the cardiovascular diseases is avoided, but, by continuing the physical exercises, one can considerably improve the capacity of the vessels to

dilate themselves with extraordinary consequences for preventing cardiovascular diseases.

S. Goya Wannamethee *et. all* have examined the relationship between the physical effort and the changes triggered by it with respect to the old people suffering from cardiac diseases and assessed the effect of the physical exercise on the death rate. Researchers came to the conclusion that men with cardiac diseases who practiced moderate and easy levels of physical activity have been associated with a significant decrease in the risk of cardiovascular affection and death risk and also with a low rate of mortality. This benefit has been observed at men under and over 65 years old, especially those men who used to practice easy forms of physical exercise and recreational activities.

These studies provide the idea that physical education is of great benefit to the blood vessels, diminishing the chances for any cardiovascular diseases to appear (Roger Blumenthal).

The patients with HTA, diabetes mellitus and hypercholesterolemia gain an advantage through the practice of moderate physical exercises. Research shows that an efficient physical exercise reduces the number of fatal heart attacks to the patients suffering from cardiac affections (American Heart Association).

- Physical exercises - help to reduce the cardiac pain and the cardiac symptomatology.

- reduce arterial press

- keep weight down, thus reducing the risk of coronary diseases and diabetes mellitus (Joolife JA et al 2006. Exercise – based rehabilitation for coronary heart disease) Cochran Database of systematic Review si American Heart Association American College of Cardiology (2006).AHA/ACC Guidelines for secondary prevention for patients with coronary and other atherosclerotic vascular disease:2006 update Circulation 113(19):2363-2372.

Project objectives

The cardiovascular disease, according to the European Cardiovascular Health Chart, is situated on the first place concerning the death rate in Europe. It is also the conductress of approximately 1/2 of the death total in Europe, causing over 4,35 millions deaths every year among the 53 World Health Organisation member states – European Region and over 1,9 million deaths every year in European Union, constituting at the same time a major cause of disability and of the quality of life decreases. They estimated that cardiovascular disease causes decrements of approximately 169 billions of euro/year in European Union economy. This represents a total annual cost of 372 euro per person. The costs oscilattes beetwen member states from less than 50 euro per person in Malta to over 600 euro per person in Germany and Great Britain. More over, countries with a low economy development, have a higher rate of cardiovascular rate. Production losses caused by cardiovascular and morbidity death rate, are

estimated at 35 billion euro in E.U., representing 21% from total costs allocated to this diseases – approximatley 2/3 from these costs are allocated to the deaths (24,4 billion of euro) and 1/3 to the disease infirmity (10,8 billion of euro) among middle aged people. (European Heart Health Charter). According to the latest OMS statistics, Romania occupies the first place concerning the death rate caused by cardiovascular disease. Romania is also number one concerning the mortality caused by both the ischemic coronary disease and the vasculocerebral accident, that is why 60000 romanian people dies annulay because of these diseases. However may deaths could be avoided given that 80-90% of people who die as a result of myocardial infarct have at least one major risk factor influenced by the change of lifestyle or therapy. Also recognizing the symptomatology, going to the doctor as soon as possible and the precocious diagnosis are essential for 2/3 of the cases. Some evaluations shows that approximately 8 millions of romanians have arterial high blood pressure. In the USA the cardiovascular diseases are also on the first place concerning the death rate (American Heart Association). They appreciate that in the USA are over 80 million people suffering from one of the cardiovascular diseases. Generally, death caused because of the cardiovascular diseases represents 36,3% from all types of deaths. For example, 16 million american people (8,7 million of men and 7,3 million of women) suffer from coronary diseases and these causes annulay over 450.000 deaths. In Australia, the 2004-2005 report(research) estimates that 334.500 of australian people,between 40 and 90 years old, are affected by the cardiovascular disease. In this country, in 2004 the cardiovascular diseases represented the cause of 19% from death total amount. In New Zealand, the cardiovascular diseases represents 40% from death total amount. The maori population is more exposed to this type of disease than the rest of co-inhabiting population. The latest researches accomplished by the British Heart Foundation, confirms that in France, deaths caused by cardiovascular diseases are up to 57 from 100.000 of people(aged between 35 and 74); 246 in Irland and 188 in England. The agreement established in Luxemburg (2006) refers to the initiation or consolidation of cardiovascular prevention plans, and to the assurance that in all European countries efficient political measures are applied. The purpose of health protection and the improvement of the quality of life among the Europe's popuation through the impact subtraction of cardiovascular disease, is registered in the E.U. pact and in the E.U. Agenda's objectives from Lisbon. With the European Commission and the OMS support, EHN and the European Cardiology Society, invites the European concernes(chains) and the Interational Organisations to engage themselves in fighting the premature deaths and the cardiovascular diseases through prevention programms and what is important

to us is that indications are to join (adhere) to the Saint Valentine declaration from the 14th of february 2000 (Winning Heart Conference), *Every child born in the new milenium has the right to live at least until the age of 65 without suffering from a cardiovascular disease that can be prevented.* Therefore **the main objective of this project is to be aligned to the European effort in improving the quality of life and fighting against the high death rate caused by cardiovascular diseases.**The project aims three aspects in what concerns the specific objectives : 1. prevention and lagging of cardiovascular diseases through physical activities that can be associated to the medicamentary treatements or to other treatements. 2. the elaboration, application and evaluation of some physical activities programmes that considers the individual's characteristic features and the disease's characteristic features. 3. the semination of the project outcomes as an act of prevention. The importance of the project and the originality elements consists of the fact that in Romania and not just our country but in all over the world, there are few researches concerning the physical effort and its implications in cardiovascular problems. That is why we propose in this research a co-operation between the specialist physician and those from driving activities, in order to elaborate easy,moderate physical activities programmes with high intensities according to the disease, to the necessary healing stage, to the lagging of the disease, to the afferent medicamentary treatment, to the activity or non-activity level, to the abilities and the preferences,to the sex , age and other particular conditions of the person. After the applied research as an experiment for a number of persons, we propose to elaborate a physical activity textbook for the health of people with cardiovascular problems. After leaving the surgery the patient will have the medical prescription and the prospectus, and the folder with the physical activity program that he has to perform. The medicamentary treatement and the physical effort will guarantee a good health.

METHODOLOGY OF THE RESEARCH

This research is meant to scientifically elaborate, after an experimental study, physical activities programmes for each disease category. These programmes will be elaborated according to : 1. the disease 2. its level 3. the convalescence period 4. the age of the person 5.patient's physical ability 6. the terms in which these are made. In elaborating these programs we will allow for 1.carefully selecting the physical exercises 2. the gradation and dosing of these exercises 3. the organisation of the field work 4. objects and helping devices. The physical activities programs will include a wide area of sports, in order to satisfy the person's needs and have a healthy result. We will have two teams of medicine specialists researchers and physical education and sports specialists. First we will select the persons with the

help of a specialist physician by disease categories, recovery stages and age. Medical and physical activity observation files will be made. A physical activity program will be established according to the particularities and the set program will be implemented. At the same time the person's monitoring will be made with careful supervision of medical assistants, of physicians from the Medicine Faculty in Constanta (all the first-aid conditions will be assured) and of physcal education teachers, university assistants,lecturers, and university professors from Physical Education Faculty, assisted by groups of students and MA students from both universities. Observations will be made and CF, AT and the electrocardiogram before and after effort will be registered. Periods of activity will be established and there will be initial, intermediate and final tests in order for an eventual correction of the scientific step to be possible. The datas will be analyzed statistical and mathematical.

PROJECT FESABILITY (having in mind the human resource (experience) and other resources involved into the development of the based on previous confirmed capacity project

The cooperation between the two faculties, The Faculty of Medicine and the Faculty of Physical Education and Sports for attaining the aim will be in charge of the research development. Thus the Faculty of Medicine through its specialists and groups of students will cover the selection of the subjects, their monitoring, the permanent control of the disease evolution, popularising the positive effect of practicing physical exercises upon the health and temporisation of the disease. The Faculty of Physical Education and Sports will provide its well known specialists and also groups of students well specialised. They will also provide the sports equipment belonging to the faculty. By cooperating with the Sport Direction in Constanta, there will be provided their sports equipment too. The duration of the experiment is o 3 years because it will have in view the categories of ages, diseases, individual particularities, etc. from children up to old persons who will do various exercises. The sport equipment that will be used when doing the physical exercises will be adapted so that the patient may benefits from sports equipment but most important will be the acquisition of the special apparatus for measuring the physical effort and the cardiovascular activities. The selected and structured physical exercises will be filmed and will be introduced during conferences and specific sessions for the benefit of the students belonging to the two faculties. there will be publish brochures and files for a better understanding of the good effect of the physical activities in prophylactic direction. we are going to tourn the research project into a volume – Physical activities for people with cardiovascular diseases/ Physical activities prescription guide for people with cardiovascular problems. the risks of the project: bad answer of the

subjects to the physical activities, even abandons, losing a number of patients, the answers has not a high fidelity. In order to prevent the risks we have to select carefully the subjects, monitoring closely the activities, organising more interdisciplinary teams/groups. The programmes has to be different to satisfy the individuality of the subjects. The scientific research has to be based on the specialized installation.

RESULTS DISSEMINATION PLAN

1. Physical activities and games for children with cardiac disease-British Journal of Sport Medicine, - ISSN
2. Adapted physical activities for people with cardiovascular problems – International Scientific Conference ANEFS, Bucharest, 2010, International Congress of Cardiology
3. Gymnastics exercises and respiratory exercises for people with cardiovascular problems – Medicine Volume ISBN and FEFS Volume Constanta, International Scientific Conference, Constanta, ISBN, both established by CNCIS, mai 2010; International Congresses and Tomanian Conference of Cardiology Society
4. Therapeutical interventions trough phisical

activities for people with cardiovascular problems – International Scientific Conference Volume organized by Sport Medicine Center, ISBN, Bucharest oct. 2010, International Congress.

5. Brochure – Physical activities for people with cardiovascular problems – Ovidius University Press, Constanta, ISBN, established by CNCIS march 2011.
6. Physical activities prescription guide for people with cardiovascular problems - Ovidius University Press, Constanta, ISBN, established by CNCIS nov. 2011.

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COMPARATIVE STUDY TO THE MENTAL POWERS BETWEEN LINES PLAYERS OF FOOTBALL

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ABSTRACT

Football is the sports activities that require a long period of training to master their skills and motor vehicle to be performed properly and correctly so that is where a sense of balance and control in the situation of the body and the link between the various parts of the movements, which reflect the proficiency of performance.

OBJECTIVE: To identify some of the differences between the mental capacity (to focus attention and awareness activist sense) between the lines to play different (line of defense, midfield, attack).

RESEARCH METHODS AND PROCEDURES: The research sample some players clubs northern region (Dohuk, Mosul, Pierce, Zakho) and football's (62) out of a player (114), or equivalent (54%) after the sample has been ruled out reconnaissance experience and the (6) players. Goalkeepers were excluded. Methods of collecting information: sources and references; analysis of the content; tests and standards; form questionnaire.

Test series used in the research: test (Bordon - Anfimov) the rate of attention; foot dominant sense test; sense test horizontal distance jump; sense perception test - activist foot vertical vacuum; sense test to strike the ball; test vertical jump, a sense of distance.

RESULTS: Results showed that there is no moral difference between the mental capacities of different lines of play, due to the fact that the requirements of the game of football skills and mastery of the physical search and a sample representing any category of applicants with an advanced level of numbers and physical skills, which means that a player is subject to the same variables during training or the game, which had to respond to external conditions of the (football, discount, mate), which has the capacity to generate a good understanding of the mentality and attention to overcome these variables.

DISCUSSION AND CONCLUSIONS: Playing three lines (line of defense line of the center line of the attack) with a sense of awareness activist close. Playing three lines (line of defense line of the center line of the attack) with the attention (the attention, and focus the attention of) close.

KEY WORDS: mental powers, football, lines players.

1 - Definition search

1-1 provided and the importance of research: --

Football is the sports activities that require a long period of training to master their skills and motor vehicle to be performed properly and correctly so that is where a sense of balance and control in the situation of the body and the link between the various parts of the movements, which reflect the proficiency of performance. The concept of mental capacity of the concepts that have emerged in the field of sports studies at an unlimited number of different sports was based on studies that focused on the concept of mental capacity and its relationship to the art of performance skills and the level of achievement to the many theories and views and ideas which had tried to study this concept in the framework of behavioral and cognitive-General to the sport, which was to be adopted in a period of close attention to its training aspects of physical and tactical skills, and ignoring the unintended and mental capacity and methods and ways to measure their skills and their relationship to the different dynamics in the end, which is focused in the direction of performance skills and the level of achievement in various sports, including football .

"The sense perceptions - the dynamics of important components in the development of the evolution of the body where movements Ttzn acquired by the synthesis of the initial problems and this will serve as a feed storage retroactivity can be maintained by the individual to control his behavior and trends in performance. Realizes or feels wrong. And is trying to amend by a sense of procedure derived from the motor and sensory organs." (Kholi, salary, 1982, 199).

Therefore, it is an important component in the development of the evolution of the body when the individual has the cognitive skills of the dynamics of a good standard, it means that the growth of the nervous system, which is reflected on other aspects and serve as an indicator. (Kholi, salary, 198, 199).

Flaab football needs to be aware of and consistently opposed to the focus of attention of a broad and physical capabilities and skills to meet the high conditions of play and overcome the different on the pitch, although the attitude and skills Ktti which falls within the player may not be repeated the same image, therefore, the muscles involved in the performance of each skill skills Football has the force of a particular muscle, depending on the method of their own, as well as a sense of resistance and muscular effort and at a speed of movement and balance as the perception is based on the accuracy of the optimal control of the ball in the sense of distance and time, place and linked to the exact understanding of the weight of the ball and form a strike to force the pace and approach of the high Altmrerp colleague or an adversary.

Thus, the knowledge and awareness of the player is of great importance not only to learn the skills and performance of its implementation, but to solve problems faced during the use of different skills to

play. (Abdullah, 1985, 180)

In view of the different players according to their position on the pitch and plans assigned to them and duties assigned to them during the course of the game leaves the impression of a recurring physical effort and skills according to the site and the Center. Defensive skills at the cost line of defense often left the impression of a sense of perception - whether activist or without soccer ball more than it is in midfield or attack, and here lies the importance of the study comparing the different lines of play in some mental capacity (the focus of attention, and a sense of awareness activist) for some clubs, players, Premier of the northern region football.

1-2 Research problem:

Although all the skill of the specificity of unique components, but there are some mental capacity to enable the acquisition and performance of many motor skills of a high degree of accuracy and adaptation may appear a result of training, and through our observation of most training programs, local trainers are focused primarily on privacy training centers as the tactical side (the line of defense, midfield, attack), therefore there has been a problem to answer the research question follows. Are there some differences between the mental capacity to play the different lines (line of defense, midfield, attack)?

1-3 Aim of research:

The research aims to: --

To identify some of the differences between the mental capacity (to focus attention and awareness activist sense) between the lines to play different (line of defense, midfield, attack)

1-4 Research hypothesis:

There are some differences of moral mental capacity between the various lines of play.

1-5 Areas of research:

1.5.1.d area of human: the premier league players to the northern area football (Dohuk, Mosul, Zakho, Pierce)

1-5-2 the time: for a period of 5-2 March 2008 until 2-3 / 2008.

1-5-3 spatial area: playgrounds clubs (Dohuk, Mosul, Zakho, Pierce).

1-6 identification of terminology:

1.6.1.d mental capacity and defined by Dr.. Ahmed Zaki Badawi as:

"The ability of individual substances to the completion of the work and adapt to work successfully .. These are acts of physical or mental health may be innate or acquired (by learning)." (Zukar, the Internet, 2003)

And he knew (Hussein, 1998) that: "The work of the preliminary adjustment of the sports lead to a correct knowledge of Almentbh something in it." (Hussein, 1998.74)

1-6-2 sense perception - activist Defined (Faraj) that ((the organization of internal information with stored information, which extends beyond the work or performance motor)). (Farag, 1977,

248).

1-6-3 for Aabboa line of defense: The first duty is to defend and duty is the second attack.

1-6-4 for Aabboa Midfielders: to Aabboa Midfielders: equal duty with the offensive and defensive line almost.

1-6-5 Aabboa line of attack: the first duty is to attack and the second duty is to defend. (Mohamed, 1994, 235).

1-6-6 lines of play: the centers are operated by the players tactical duties as assigned by the (line of defense, midfield, attack) the definition of a procedural.

1-6-7 attention and know (Hussein, 1998) that: "The work of the preliminary adjustment of the sports lead to a correct knowledge of Almentbh something in it." (Hussein, 1998.74)

2-1 Theoretical framework:

2-1-1 Concept of mental capacity

The concept of mental capacity created in the field of applied psychology and at the end of the nineteenth century related to the pilot studies at the beginning of the twentieth century, appeared in France associated with the measurement of intelligence in the research world, "one interface" and then developed by the English world, "Charles Spearman," which rejected the term intelligence because it carries many meanings, and to replace the term "the public", which reflects the mental energy to dominate all other mental activities, according to the requirements of his theory, known as the "theory of *". The most psychologists agree on the definition of mental capacity as a result mental performance, such numerical and innovative capacity. The world "Trston" saw that the mental capacity is determined by the status of any individual's conduct as a renewed sense that they can be played by the individual or the work. They appear as a result of specific performance and it is this apparent behavior can be observed and thus measured. (Zukar, the Internet, 2003)

The (Hormuz, and Ibrahim 1988) Feacheran the mental capacity "as related to what is happening to the mind, which respond to different stimuli that any mental capacity, including the process, and the type of Mterha, and various forms of response, and therefore emphasizes the purely mental capacity (the ability empirical) or the type of exciting article (numerical ability) or a response, which reflects the ability of speed, or demonstrate the patience and the potential for the realization of individual mental long. (Hormuz, and Ibrahim: 1988, 814)

It is clear from the views during the pre-mental capacity that there is a difference between the researchers identified some of this term does not distinguish between him and connecting him to prepare some of the classification and the convergence of these views to the mental capacity to be linked to performance, but some of them occurred in the

confusion between the willingness and capacity, which means that no difference between the willingness and the capacity if it was intended training process (of education) the broad sense, and therefore the interaction of the individual with the environment, either before the training, the mental capacity remain a mere willingness fungal tends to side, and this shows the difference between the ability and readiness. (Zukar, the Internet, 2003)

The item (AI) mental capacity setup in several pictures, including the ability of the mind and the ability of interpretation and believes that the development of mental capacity in the need to take into account a number of things including the mental capacity to generate in the human potential and to grow and much care and training and weaken and die of neglect and abuse, or poor education. (AI - , the Internet, 2004)

2-1-2 Feeling associated with some types of motor activity:

1) a sense of dynamic: - is the sense of muscular motor Alihsasat of the most important types of sporting activity, and the receptors sense the muscular motor consists of a large number of elements of the sensory nerves that are surface muscles and joints, as the sound of any human being can close his eyes and touched his nose or ear or any part of the body of a high degree of accuracy.

2) a sense of balance: - depends on a balance-keeping and internal ear, which enables us to see if we Mgulwpin or places of business as usual, as well as, in particular, is in the pole vault and Alorjuhat air gymnasts.

3) a sense of Olc: - Olc help feeling a sense of dynamic as well as the knowledge and awareness of the nature of things in terms of flexibility and firmness and that these things come into the surface of the skin.

4) the visual sense: - The important role of leading the eye to the future role of the visual sense, which has the role of president in the motor activity, while sharing with all other types of Alihsasat awareness and understanding of the locomotive and its compatibility with the realization of the conditions and the conditions of activity and help to understand the player for his skills. (Diabetes, 1990, 22).

2-1-3 aware of the types of sports-related activity: Associated with many types of sporting activity of perceptions that can be developed and developed in the course of learning and training, and most important of these perceptions as follows:

1) a sense of awareness of water, the swimmers and water polo players.

2) recognize the sense of timing, the scene of the players and the field.

3) awareness of a sense of distance, for the boxers and Allowathbyn.

4) a sense of awareness of the tool, the football players and handball.

5) Balbsat sense of awareness, for the wrestlers.

6) a sense of awareness of the bar, to Msabaki high

jump and pole vault (Jalal, Allawi, 1975, 320).

Abu Saud, dividing them into: --

1) recognize the sense of movement: a movement of moving parts of the body involved in the performance in a coherent and consistent manner, aware of his importance in the motor sports in terms of awareness of movements by the player himself or recognize the movements of the competitors.

2) recognize the sense of time: It depends on the process of scheduling a sense of the relations of successive and continuous time, a task in the field of sports as a player must have a full sense of the time it takes for successive and frequent movement in order to be able to determine the speed of motor performance and tactical methods to determine the appropriate period of time each depending on the circumstances of the activity.

3) awareness of a sense of distance: in the exercise of any type of activism is the player in certain places require a certain distance determined by the performance commensurate with the code where the player, and the realization of the right player to the place where it is in the exercise motor activity and the relationship of this place, he managed various distances to determine the precise motor skills. (Abu Al-Saud, 1990, 19).

2-1-3 The relationship between feeling and understanding:

The relationship between perception and a sense of close relationship can not be neglected because of the lack of sense of the senses in turn lead to a lack of topics associated with it, Validrack derives its effectiveness and its Alihsasat of those carried by the supplier, where the nerves are aware of the process, it is through the vision very much aware of the issues and know the meaning and function and characteristics (Saliba, P. T., 21)

If we look at the things around us we will find that each is different from the larger size of the other, and realize that the meaning of each is different from the other, A good move if the coach and saw the ball fly and goalkeeper standing banana Fissedrick The lead manager of a correction of the net, meaning that the phenomenon of perception psychological vehicle requires mentally complex, but there is a sense of simple with a wave of light emitted from the coach and the ball and his goal at all. (Barow, Geer, 1973, 126).

2-1-4 Concept of attention:

The attention of the important factors for a successful performance of skills in sports, Vriadi can not access to high levels of performance only when it draws attention to the full performance of the skills without other things, and that performance does not happen only when it focuses attention on the sports-related factors, the skill, attention V_it impacts When the negative performance sports is intended for the skill and attention in the case of psychological - emotional positive will be able to better performance levels that allow the physical abilities. (Captain, 1990, 281)

It is understood that the willingness of the attention in the cognitive sense of direction towards the position of a particular individual or as a whole and in the area when the locomotive is to attract an individual of a thing as an expression of his condition, but in the sport is ready to create a mind for a period of time. (Mahmoud Shalash, 2000.181)

The (Abdul-Hamid, 1989) "The most important manifestations of attention to prove its impact on the level of performance in the process of sports to focus attention, focusing attention affect the accuracy and clarity and mastery of the technical aspects of the parts of motor skill." (Abdul-Hamid, 33-34, 1989) as The focus help on the reaction of a good response and then the dynamics of the focusing of attention is a good act is difficult without a motor attention to other details, because the attention disrupts motor act fast and then become weak reaction. (Mahgoub, 2001, 48)

2-1-4 Play centers:

Although the modern game of football requires that all players involved in the attack and defense during the game, but there must be coordination between the organization and functions of each of them during the performance so that there is no conflict between their duties, and also so as not to focus on some aspects at the expense of the neglect of some other aspects, whether in attack or defense. On this basis, the distribution of duties on the offensive and defensive players is important and necessary. The division of the players in terms of the performance of their duties: --

Tactical attack and defense:

First: to Aabboa line of defense: The first duty is to defend and duty is the second attack. Second: to Aabboa Midfielders: equal duty with the offensive and defensive line almost. Third: Aabboa line of attack: the first duty is to attack and the second duty is to defend

2-2 Previous studies:

2-2-2 (study Rashid, Novell Fadel, 2001) entitled: ((The study of the relationship between some of the sense of cognitive capacity - mobility, physical and skill to the football players))

- study aimed to identify the relationship between the cognitive abilities of some sense - some of the elements of mobility and physical fitness skills and attributes to the players, club football.
- study was conducted on a sample of (60) players from the club players of the northern region (of Mosul, Irbil and Dohuk) football and the participants in the league to the country's soccer season 1999 - 2000 meters. The use of tests and standards as a means of gathering information. The results of the study to the relations and direct correlation between the perception and the opposite sense - as opposed to the level of performance skills and some elements of physical fitness. (Rashid, 2001, 30).

3-Procedures of research:

3-1 Curriculum research:

Approach has been used as a descriptive way the survey that the most appropriate approach to suit the nature of the problem.

3-2 Sample research :

The research sample some players clubs northern region (Dohuk, Mosul, Pierce, Zakho) and football's (62) out of a player (114), or equivalent (54%) after the sample has been ruled out reconnaissance experience and the (6) players Goalkeepers were excluded. Table (1) shows a sample search.

Table (1) Research shows the sample

Sample	Number
line of defense	20
Midfielders	22
Attacks	14
total	56

3 - methods of collecting information:

3-3-1 sources and references.

3-3-2 analysis of the content.

3-3-3 tests and standards.

3-3-4 form questionnaire.

3-4 Test series used in the research:

3-4-1 test (Bordon - Anfimov) the rate of attention (Test of attention and focus of the attention. (And Mahmoud Hussein, 1989,197,200)

3-4-2 foot dominant sense test.

3-4-3 sense test horizontal distance jump.

3-4-4 sense perception test - activist foot vertical all tests have

Extraction method has been re-testing to ensure the stability of the tests where the tests were applied to a sample of five players were randomly selected sample of the research was re-testing, and used the simple correlation coefficient between the test results are the first and second test was a high correlation coefficient values ranging between (0.816-0.915) This means that

vacuum.

3-4-5 sense test to strike the ball.

3-4-6 test vertical jump, a sense of distance.

3-5 scientific basis of the tests:

3-5-1 ratified tests

Has been ratified by the use of the content and sincerity of the self-extracting truth tests where the tests were presented at a group of experts and specialists (). The experts agreed on the sincerity of the tests to achieve the purpose for which it was.

3-5-2 stability tests

A high degree of consistency, as shown in Table No. (2).

Table(2). Shows the factors of stability and honesty of self-tests of mental abilities applied to the sample survey

mental capacity	Tests	Factory of Reliability	self- Validity
Attention	Unit attention	0.814	0.942
	Focus attention	0.915	0.951
A sense of awareness – activist	Sense of the Dominant foot	0.915	0.961
	Horizontal distance jump	0.816	0.908
	Foot vertical vacuum	0.89	0.952
	Vertical jump	0.84	0.919

3-5-3

Objective tests

The tests used for easy understanding and clear and not subject to interpretation and far from self-evaluation where the registration is the use of units of distance, class and so is the objective of the tests used for good.

3-6 Reconnaissance experience:

The experiment was conducted on a sample of (6) players from the original sample search was random and tested way to identify a view to overcome the negatives and positives, which provides the requirements of the success of the test has been

reached:

3-6-1 appropriate devices used in the measurement.

3-6-2 validity of the test sample and the ability of research on items that test.

3-6-3 assistants how to implement the tests and measurements.

3-7 Statistical treatment:

Computational center, the standard deviation, a test of the T unequal (Ibrahim al-Tikriti and Ubaydi: 39 to 81 - 276, 1999).

4 - Presentation and analysis of results and discussion:

4-1 Presentation and analysis of the results:

4-1-1 presentation and analysis of Alamaa William statistical tests of mental abilities in question.

Table(3)

Community shows the calculation of standard deviations and mental capacity in question

The player lines	line of defense		Midfielders		Attacks		Total	
Test of mental capacity	X	S	x	S	x	S	x	s
Sense of the Dominant foot	2.5	1.14	3.01	1.45	3.81	1.35	3.22	1.35
Horizontal distance jump	3.24	1.96	3.89	1.47	3.01	1.35	3.02	1.35
Foot vertical vacuum	3.15	1.67	3.19	1.55	3.36	1.49	3.27	1.49
Vertical jump	3.99	1.47	4.27	1.08	3.92	1.40	3.67	1.04
Unit attention	104.27	8.057	109.11	7.647	106.22	8.532	111.52	8.352
Focus attention on	6.158	4.716	7.53	3.113	5.713	3.651	5.119	3.651

Seen from the table (3) that the highest value to the central line of defense on the arithmetic to test the sense of control with a foot (2.5) and standard variance of \$ (+1.14) . The lowest value for the central accounting appeared to test the sense of distance of the vertical jump with a value of computational center (3.99) and standard variance of \$ (1.47). The highest value for the central midfield after accounting for the sense of the test, with the dominant foot (3.10) and the standard variance of \$ (+ 1.45). The lowest value for the central accounting of the test showed a sense of distance of the vertical jump with a value of computational center (4.27) and standard variance of \$ (1.08).

The highest value for the central line of attack, the arithmetic test showed a sense of control with a foot

(2.81) and standard variance of \$ (+ 1.35). The lowest value for the central accounting appeared to test the sense of distance of the vertical jump with a value of computational center (3.92) and standard variance of \$ (+ 1.40). While the higher the center of my account to the total sense of the test - is the muscle at the line of attack and compromise accounting (3.21) and standard variance of \$ (+ 1.44). In a test of attention, reflecting the highest value in the center of attention in the amount of line (109.11) and the standard of variance (7.647), while the highest value on the focus of attention is the line of attack (5.713) and the amount of variance (3.651).

4-1-2 Presentation and analysis of significant differences between the players, the three lines

Table (3): Shows significant differences between the lines of play (on defense - the center - attack)

Test of mental capacity	Value (v) calculated Line of defense - the center	Value (v) calculated Line of defense – Attack	Value (v) calculated Line of Attack - the center
Sense of the Dominant foot	1.259	1.023	0.965
Horizontal distance jump	0.992	1.007	1.21
Foot vertical vacuum	0.959	0.859	0.978
Vertical jump	1.81	0.785	0.994
Unit attention	1.664	1.043	1.942
Focus attention on	1.321	2.17	1.889

Value (v) seriously and preliminary indication of the level of (0.05) and the degree of freedom (42-2) = 2.02

Value (v) seriously and preliminary indication of the level of (0.05) and the degree of freedom (36-2) = 2.04

Value (v) seriously and preliminary indication of the level of (0.05) and the degree of freedom (34-2) = 2.04

Seen from the table (3) that there is no significant moral difference between the players to play different lines (line of defense - the center) (line of defense - attack) (offensive line - center), where the value (v) calculated to test the mental capacity of the players line of defense and center, respectively (1.259) (0.992) (0.959) (1.076) (1.81) (1.664) (1.321), less than the value (v) seriously and Leh and the amount of (2.02), while the value of (v) calculated between the players line of defense and attack, respectively (1.032) (1.007) (0.859) (1.552) (0.785) (1.043) (2.017), less than the value (v) seriously and Leh and the amount of (2.04). The value of (v) calculated between the players midfield line of attack, respectively (0.965)(1.21) (0.978) (1.44) (0.994) (1.942) (1.899), less than the value (v) seriously and Leh and the amount of (2.04) 4-2 discuss the results:

Results showed that there is no moral difference between the mental capacities of different lines of play, due to the fact that the requirements of the game of football skills and mastery of the physical search and a sample representing any category of applicants with an advanced level of numbers and physical skills, which means that a player is subject to the same variables during training or the game, which had to respond to external conditions of the (football, discount, mate), which has the capacity to generate a good understanding of the mentality and attention to overcome these variables. indicates (Majid, 1989) that

requires a good sense of compatibility code in a good performance and accuracy. (Majid, 1989, 166). It can not be the player to be able to perform a high level of skill with the accuracy of delivery, without having a high degree of individual attention, and perhaps the moral of this relationship is an important reason for the results of the skills

The specificity of the game of football to raise the required capacity and sensory stimuli associated with them in the performance of any skill or try to achieve any achievement in spite of the different degree of strength and intensity in proportion to the specificity of each skill

The (Zahran, 1989) ((The sense of perception - activist in the field of sport and of great importance to the important role for all movements consensus)) (Zahran, 1989, 117).

Also due to the fact that most of the trainers often overlooked in the training center and lines of any players in mind the principle of privacy in the training based on the concept of total football and attention to the comprehensive training for all the players and the allocation of a small part of the unit training centers for the privacy of the players and given mostly in the side Kti. Therefore, most of the players to develop their mental capacity is tight, and depending on the circumstances of the training and playing, both in similar training programs, or the game. This means that the player learns through repetition, which in turn develop a sense of awareness - in the muscle used as part of these circumstances. The (Abdullah, 1988) ((that the frequent use of a certain part in a particular skill and a lot a bid to reinforce the sense in which more than the other part, which be used less)). (Abdullah, 1998, 17).

This confirms (Saadi, 2002) that he had evolved through practice and repetition, or personal experience and the adequacy of the individual and the capacity, the more March or skill player movement has evolved to the status of awareness for this skill, and it is here, the understanding of similar movements, and the possibility of separation between them is the status of

the aware of the characteristics of (Al-Saadi, 2002, 103).

5 - Conclusions and recommendations: -- Conclusions 5-1

5-1 - playing three lines (line of defense line of the center line of the attack) with a sense of awareness activist close.

5-1-1 playing three lines (line of defense line of the center line of the attack) with the attention (the attention, and focus the attention of) close.

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Supplements

1) Supplement No. (1)

A questionnaire on the validity of the tests cognitive sense - the dynamics of Mr. respected expert 00000:

Will conduct research in the book, "" comparative study of the mental capacity of some lines between the different players to play football, "" In view of your experience and expertise in this area, please indicate your opinion on the validity of a sense of cognitive

tests - to measure the dynamics of the following cognitive abilities sense -- mobility described below and according to their importance. Note: Please carry out an appropriate adjustment to the test when they find the need for such an amendment .2 - any further comments.

Tests

1 - test the sense of muscle force.

2 - test the sense of the horizontal distance jump.

3 - testing the sense of perception - activist foot vertical vacuum.

4 - the sense of the test is outdated.

5 - a sense of emptiness written test horizontal.

6 - a sense of emptiness written test vertical.

7 - test fired a sense of the ball.

8 - to test the sense of perception - an alias of the time.

9 - a sense of distance test vertical jump.

10 - test (Bordon - Anfimov) rate for the attention of researchers

INFORMAL PHYSICAL ACTIVITIES IN YOUNG PEOPLE

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ABSTRACT

Informal physical activities in young people. The concept of the game as a cultural phenomenon was partly influenced by the ideas of the Spaniard Ortega y Gasset.

OBJECTIVE: The aim of this study was to examine the nature of the physical activities practised by young people in their leisure time through questionnaires.

RESEARCH METHODS: Study sample. This study involved 111 young people: 56 girls and 50 boys, aged between 12 and 17 years old. They study in different colleges in the three provinces of the Basque Autonomous Community.

RESULTS: In both studies there are three main reasons for practising informal physical activities: "because they like it" - "for fun and enjoyment" and "for exercising".

DISCUSSION AND CONCLUSIONS: Since the type of activities carried out during leisure time will affect many aspects of a persons life, it is important to prevent these young people from becoming adults and spending most of their leisure time in sedentary activities.

KEYWORDS: physical activities, girls, boys.

INTRODUCTION

Over the years, the significance of the word "sport" has adapted to the social changes that have happened. The concept of the game as a cultural phenomenon was partly influenced by the ideas of the Spaniard Ortega y Gasset (1996). The importance of this research is that we will gather information about the nature of the physical activities practised by young people in their leisure time. (G. Ferrando, M, 2006).

Hypothesis

The aim of this study is to obtain information about the habits that young people have in the Basque autonomous Community during the practice of

informal physical activity. Informal Physical Activity is referred to as any physical practice that meets these three conditions:

1. **Performed outside the educational system.**
2. **Not headed by a professional.**
3. **Performed collectively or individually.**

METHODS

Procedure. We talked to the principles of different schools. We gave them the questionnaires and explained to them the protocol to complete them.

Documentary evidence: to develop this research a questionnaire that included modified items of García Ferrando, Mestre and Llopis (2007).

-What kind of informal physical activity do you practise?

-In general, how often do you practise these informal activities?

-What is the main reason for practising these informal physical activities?

-What is the main reason for not practising any physical activity?

Results/first variable

-Boys

1. Playing with their friends, not in a team. 24.24%.
2. Cycling 12.70%.
3. Rollerblading 12.50%.
4. Walking 11.07%.
5. Playing football 10.42%.

-Girls

1. Walking 9.11%.
2. Playing football 8.91%.
3. Cycling 8.72%.
4. Going to the mountains 6.59%.
5. Playing basketball 6.20%, not in a team.

Results/second variable

-Boys

1. Walking (56%).
2. Cycling (30%).
3. Playing soccer with their friends, not in a team (22%).
4. Playing basketball with friends, not in a team (12.50%).
5. Playing to different games with a ball (10%).

-Girls

1. Walking (60.71%).
2. Dancing (19.64%).
3. Playing soccer with their friends, not in a team (10.71%).
4. Playing different games with a ball, not in a team (8.91%).
5. Doing other physical activities with friends, not in a team (8.93%).

Results/third variable

-Boys

1. Cycling (28%).
2. Playing soccer with their friends, not in a team (24%).
3. Playing different games with a ball (8%).
4. Playing handball with their friends, not in a team (8%).
5. Doing other physical activities with friends, not in a team (8%).

-Girls

1. Cycling (12.50%).
2. Playing different games with a ball, not in a team (8.93%).
3. Dancing (7.14%).
4. Going to the mountains (5.36%).
5. Walking (5.63%).

Results/fourth variable

-Boys

1. Playing soccer with their friends, not in a team (28%).
2. Playing basketball (18%).
3. Going to the mountains (12%).
4. Cycling (17.86%).
5. Playing table tennis (8%).

-Girls

1. Cycling (17.86%).
2. Dancing (16.07%).
3. Rollerblading (14.29%).
4. Playing soccer with their friends, not in a team (12.5%).
5. Playing basketball with friends, not in a team (10.71%).

Results/fifth variable

-Boys

1. Swimming (30%).
2. Going to the mountains (24%).
3. Playing tennis, not in a team (24%).
4. Playing table tennis, with friends, not in a team (18%).
5. Cycling (14%).

-Girls

1. Cycling (22%).
2. Going to the mountains (28.57%).
3. Swimming (26.79%).
4. Rollerblading (19.64%).
5. Playing soccer with their friends, not in a team (19.64%).

Results/sixth variable

-Boys

1. Skipping (16%).
2. Playing with the elastic bands (14%).
3. Wind surfing (8%).
4. Sailing (8%).
5. Playing different games in the park (8%).

-Girls

1. Playing with the elastic bands (12.5%).
2. Playing different games in the park (12.5%).
3. Rowing (10.71%).
4. Climbing (8.93%).
5. Surfing (8.93%).

Results

Reasons for the practicing informal physical activities

Table 1.Comparative of the reasons that boys and girls have for practising informal physical activities

Informal physical activities		
	Boys (%)	Girls (%)
A- <i>"for fun and enjoyment"</i>	14	30,4
B- <i>"to meet friends"</i>	8	19,6
C- <i>"for the fun of exercising"</i>	12	5,35
D- <i>"because they like it"</i>	50	37,5
E- <i>"stay slim"</i>	0	5,35
F- <i>"to disconnect"</i>	0	0
G- <i>"to stay and keep healthy"</i>	6	0
H- <i>"to become an athlete"</i>	6	1,8

Results

Table 2. Comparative of the reasons that boys and girls have for not practising informal physical activities.

Reasons for not practising		
	Boys %	Girls
Did not respond (NA)	98	96,4
Lazines	2	3,6

Discussion

It is worth noting that the practised informal physical activities by both boys and girls which is done every day or twice or three times a week does not require any other person. Regarding the differences between genders, the greatest occurs in the activities which were practised on holidays. Swimming is the only common activity between boys and girls. With regard to the reasons for practising informal activities, the data of this study is in line with the survey on the sport habits of Spaniards in the year 2005 by García Ferrando (2007). In both studies there are three main reasons for practising informal physical activities: *"because they like it"* - *"for fun and enjoyment"* and *"for exercising"*.

Conclusions

Society is changing and with it also people's habits. Therefore, some changes in leisure time are expected. The five most practised activities by Spaniards from 1990 to the year 2000 were:

1. Being with the family.
2. Watching television.
3. Being with friends.
4. Reading books and newspapers.
5. Listening to music.

In the year 2005 **walking** appears for the first time as one of *the most practised physical activities*. We understand that this data requires a deeper reflection.

Since the type of activities carried out during leisure time will affect many aspects of a pupils life, it is important **to prevent these young people** from becoming adults and spending most of their leisure time in sedentary activities.

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THE CAPACITY TO MAINTAIN THE 50 MP TRIAL MAXIMUM RUNNING SPEED

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ABSTRACT

Generally speaking, it seems that there are a lot of training errors at the sprint training and a proof for that is the fact that we cannot outcome the anonymity on a worldwide scale. This phenomenon stands out starting with the training stage for children at the speed running instruction where the „forcing phenomenon” has been used for many years for the sprint running.

OBJECTIVE: The purpose of this study is the necessity to clarify the children’s real potential concerning their performances at a maximum speed running trial, on customary distances during their training, taking into account the acceleration stage and the maximum speed stage to maintain it.

RESEARCH METHODS AND PROCEDURES: To achieve the proposed targets we have noted the time for each 5m interval during the 50mp trial, the overall time and we have worked out the medium speed in m/s for each 5m interval and the acceleration in m/s/s for each 5m interval with a timing equipment made of 10 photoelectric cells. The electronic timing equipment made in Utah, S.U.A., is called BROWER TIMING SYSTEM. The statistic data treatment determined the discovery of the arithmetic figure, the standard deviation and the variability quotient. The experiment took place in August and September.

RESULTS: The racing speed, the speed for the 0-5m interval increased between the initial and the final checkup for (E) group with $0,88\text{m.s}^{-1}$ and the acceleration with $1,42\text{m.s}^{-2}$ compared with (M) group for which this increase is from $0,19\text{m.s}^{-1}$, respectively $0,22\text{m.s}^{-2}$. Compared to the initial stage, all the subjects have reached the maximum speed in the final stage on longer distance intervals, 20-25m and 25-30m, and two of the subjects in the (E) group reached it in the interval 30-35m.

DISCUSSION AND CONCLUSIONS: The efficiency of the training program used for subjects of the (E) group has been confirmed. The significant increase of the performance for the 50mp trial (by 54,3%) is due to the speed increase during the acceleration stage. For the 50mp trial- the speed, in the case 11 year old children, shows an increasing curve up to reaching the maximum speed, followed by a decreasing curve because of a decrease of the running speed without a stage where the maximum accumulated speed at the 50mp trial is maintained.

KEY WORDS: maximum running speed, 50mp trial, young girls athletes.

Introduction

Generally speaking, it seems that there are a lot of training errors at the sprint training and a proof for that is the fact that we cannot outcome the anonymity on a worldwide scale. This phenomenon stands out starting with the training stage for children at the speed running instruction where the „forcing phenomenon” has been used for many years for the sprint running. We consider that in the case of children, the origin of the instruction errors lies in the fact that many aspects concerning the real effort possibilities of children, at this level, have not been known yet

because they have not been studied or they have been but with very rudimentary tools. The motivation of our option is based on the necessity to clarify the children’s real potential concerning their performances at a maximum speed running trial, on customary distances during their training, taking into account the acceleration stage and the maximum speed stage to maintain it.

The Subjects

The subjects of the experiment are distributed in two control and experiment groups containing 15 sportsgirls

Tab. no. 1 The subjects of the control (M) and experiment (E) groups

Groups	Test	Parametre X ± S		
		Age (years) girls=15	Body weight (kg)	Body height (cm)
E	I	11±0,57	34±7,07	1,44±0,08
	F	11,2±0,32	35±2,03	1,45±0,02
M	I	11,2±0,20	36,06±1,15	1,45±0,05
	F	11,4±0,39	37±2,09	1,46±0,04

Distances (m)		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
(M) initial	Ti (s)	1.76	0.92	0.92	0.89	0.89	0.91	0.91	0.93	0.95	0.96
	t ₂ -t ₁	0	-0.84	0	-0.03	0	+0.02	0	+0.02	+0.02	+0.01
(M) final	Ti (s)	1.65	0.89	0.87	0.85	0.84	0.84	0.87	0.89	0.91	0.94
	t ₂ -t ₁	0	-0.75	-0.02	-0.02	-0.01	0	+0.03	+0.02	+0.02	+0.03

Table no. 2 Experiment group (E)

Methods

1. Subject description according: age, weight(kg) and height(m)

2. The system of the control trials: the trial 50mp., with a standing start, free start. The data administering, measurement and processing is achieved by means of mathcad program.

Hypothesis: we consider that the 11 years old athletes do not have the capacity to maintain the maximum running speed for the 50mp sprint trial.

The experiment protocole

To achieve the proposed targets and also the research hypotheses, we have noted the time for each 5m interval during the 50mp trial, the overall time and we have worked out the medium speed in m/s for each

Results presenting and their interpretation

The analysis of the average time on intervals (T/i)

Table no. 3. Control group(M)

Distances (m)		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
(E) initial	Ti (s)	1.41	0.93	0.84	0.79	0.78	0.80	0.82	0.84	0.86	0.88
	t ₂ -t ₁	0	-0.48	-0.09	-0.05	-0.01	+0.02	+0.02	+0.02	+0.02	+0.02
(E) final	Ti (s)	1.13	0.85	0.8	0.78	0.75	0.73	0.76	0.78	0.79	0.81
	t ₂ -t ₁	0	-0.28	-0.05	-0.02	-0.03	-0.02	+0.03	+0.02	+0.01	+0.02

Starting with the very beginning we are going to make a comparative analysis between the (E) and (M) groups on the basis of their value differences at the final checkup, compared to the initial values, with the intention of highlighting the progress made by (E) group. The 0-5m time interval is -0,28s shorter for (E) and with only -0,1s for (M), the distance of the

The analysis of the medium speed(V/i), of the medium speed variation(V₂-V₁/i) and of the medium acceleration

5m interval and the acceleration in m/s/s for each 5m interval with a timing equipment made of 10 photoelectric cells. The electronic timing equipment made in Utah, S.U.A., is called BROWER TIMING SYSTEM. The statistic data treatment determined the discovery of the arithmetic figure, the standard deviation and the variability quotient. The experiment took place in August and September. It was preceded by the selection of the subjects from the application groups for polyvalent athletic training with students in the III-rd and IV-th year of study at „Ovidius” University, athletics specialty. The time length of the experiment was 8 (1+6+1) weeks and the subjects had 3 training sessions per week and the aim was the development of the their speed and impulse stroke.(C. Gevat, 2002).

acceleration stage increased for (E) from 25m to 30m at the same time with the decreasing of the minimum timing on the interval from 0,78 s to 0,73 s. The same increase on the 5m interval took place with the (M) but from 20m to 25m, a shorter acceleration stage on a time interval with higher values. The shortest time on the interval decreased for (M) from 0,89s to 0,84s.

Table no. 4. The medium speed/i and the speed variation calculus (V_2-V_1) and the medium acceleration, a (med.)- (E) Group

Intervale (m)		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
Initial	$V_{m.s^{-1}}$	3.54	5.38	5.95	6.33	6.41	6.25	6.10	5.95	5.81	5.68
	V_2-V_1	0	1.84	0.57	0.38	0.08	-0.16	-0.15	-0.15	-0.14	-0.13
	a(med)	2.51	1.99	0.68	0.48	0.10	-0.20	-0.18	-0.16	-0.16	-0.15
	suma				$\Sigma=+5.76$					$\Sigma=-0.85$	
Final	$V_{m.s^{-1}}$	4.42	5.88	6.25	6.41	6.66	6.85	6.57	6.41	6.33	6.17
	V_2-V_1	0	1.46	0.37	0.16	0.25	0.19	-0.28	-0.16	-0.08	-0.16
	a(med)	3.91	1.70	0.46	0.20	0.29	0.26	-0.37	-0.20	-0.11	-0.19
	suma					$\Sigma=+6.82$				$\Sigma=-0.87$	

Table no.5. The medium speed/i and the speed variation calculus (V_2-V_1) and the medium acceleration calculus, (M) Group

Intervale		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
I	$V_{m.s^{-1}}$	2.84	5.43	5.43	5.62	5.62	5.49	5.49	5.38	5.26	5.21
	V_2-V_1	0	2.59	0	0.19	0	-0.13	0	-0.11	-0.12	-0.05
	a(med)	1.61	2.81	0	0.21	0	-0.14		-0.12	-0.13	-0.05
	suma				$\Sigma=+4.63$					$\Sigma=-0.44$	
F	$V_{m.s^{-1}}$	3.03	5.62	5.75	5.88	5.95	5.95	5.75	5.62	5.49	5.32
	V_2-V_1	0	2.59	0.13	0.13	0.07	0	-0.20	-0.13	-0.13	-0.17
	a(med)	1.83	2.91	0.15	0.15	0.08	0	-0.22	-0.15	-0.14	-0.18
	suma					$\Sigma=+5.12$		$\Sigma=-0.69$			

The analysis of these results offers a series of findings, relevant for our experimental test. So, the racing speed, the speed for the 0-5m interval increased between the initial and the final checkup for (E) group

The length of the acceleration stage was mentioned in the time interval analysis. The differences concerning the interval maximum speed, reached during the acceleration stage, between the initial and final checkup is of $0,44 \text{ m.s}^{-1}$ for the (E) group and lower with $0,33 \text{ m.s}^{-1}$ for the (M) group.

For the acceleration stage, between the initial and final checkup, the speed loss was with $-0,05 \text{ m.s}^{-1}$ less (from $-0,73 \text{ m.s}^{-1}$ to $-0,78 \text{ m.s}^{-1}$) in the case of (E) group and with a lot more, $0,22 \text{ m.s}^{-1}$ (from $-0,41 \text{ m.s}^{-1}$ to $0,63 \text{ m.s}^{-1}$) for the (M) group. We mention the fact that, normally, the speed loss is higher for higher speeds. The little difference in the increase of the speed loss, between the initial and final checkup for the (E) group is the effect of the constant training. The sum of the positive accelerations in the interval of the two checkups has grown for the (E) group by $1,06 \text{ m.s}^{-2}$, while for the (M) group the increase was of only $0,49 \text{ m.s}^{-2}$, this happening when at this group the deceleration has significantly decreased by $-0,25 \text{ m.s}^{-2}$, compared to only $-0,02 \text{ m.s}^{-2}$, in the case of (E) group. All these figures show the efficacy of the training program of (E) group.

The analysis of the medium speed dynamics on intervals highlights with this study as well the fact that we cannot certainly identify the existence of a 'maximum speed stage'. For the (M) group, at the initial checkup we have observed the increase and the decrease of the speed in stages, between the intervals 5-10m and 30-35m, the maximum speed being maintained during the interval 20-25m. At the final checkup, suffering a linear increase and decrease, the maximum speed is also maintained for an interval, which is (25-30m), this happening on a reduced speed ($5,95 \text{ m.s}^{-1}$). For the (E) group, both at the initial and the final checkup the speed dynamics has an increasing linear curve up to the maximum speed and then, in a linear way as well, the curve starts reaching the decreasing stage. Compared to the (M) group the maximum speed limit is much higher ($6,85 \text{ m.s}^{-1}$, as a final figure). The real progress element as well as in the case of 'A' longitudinal study, is the speed increase

with $0,88 \text{ m.s}^{-1}$ and the acceleration with $1,42 \text{ m.s}^{-2}$ compared with (M) group for which this increase is from $0,19 \text{ m.s}^{-1}$, respectively $0,22 \text{ m.s}^{-2}$.

during the acceleration stage on a background increase of the acceleration distance length as well, especially in the case of (E) sample group. The medium acceleration dynamics chart highlights at the final checkup, the difference between the subjects of (E) and (M) groups.

Compared to the initial stage, all the subjects have reached the maximum speed in the final stage on longer distance intervals, 20-25m and 25-30m, and two of the subjects in the (E) group reached it in the interval 30-35m. Concerning the subjects' capacity to maintain the medium of the accumulated maximum speed of the acceleration stage, only for the (E) group and only for the final stage, eight of the subjects have maintained this speed for one more interval. We will discuss this aspect at the final comparative analysis between all the experimental sample groups and the witness group.

Conclusions

1. The efficiency of the training program used for subjects of the (E) group has been confirmed by the fact that they have progressed with higher rates at all the analysed indicators than the subjects of the (M) group.

2. The significant increase of the performance for the 50mp trial (by 54,3%) is due to the speed increase during the acceleration stage. For the 50mp trial- the speed, in the case of 11 year old children, shows an increasing curve up to reaching the maximum speed, followed by a decreasing curve because of a decrease of the running speed without a stage where the maximum accumulated speed at the 50mp trial is maintained.

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THE INFLUENCE OF SPINE POSITION, ABDOMINAL AND BACK MUSCLES IN PREVENTING TENNIS INJURIES

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ABSTRACT

Greavu N., Panait L. The role of spine position, abdominal and back muscles in preventing tennis injuries

OBJECTIVE: The aim of this study was to review the tennis injuries, and to detect better ways for preventing the injuries.

PROCEDURES: This paper specifically addresses (1) Tennis injuries: types and causes; (2) The role of correct body posture in working on and off court; (3) The role of conditioning and warming up.

CONCLUSIONS: Based on our believes we suggest that with a correct body position, especially the position of the spine witch improves a lot of body functionality, combined with a better work on abdominal and back muscles, the athletes will have better results with less work and the number of injuries will decrease dramatically.

KEY WORDS: tennis injuries, “tennis elbow”, shoulder tendinitis, conditioning, warm-up, cool down.

Purpose

The purpose of this white paper is to review current research on tennis play and to present coaching applications related to tennis, and concepts of injury prevention. This paper specifically addresses (1) Tennis injuries: types and causes; (2) The role of correct body posture in working in and off court; (3) The role of conditioning and warming up.

Overview of Injuries in Tennis

One of the major goals of teaching tennis is to maximize tennis performance while minimizing risk of injury. Much effort has been devoted to identifying factors related to tennis play and tennis technique that may influence the risk of injury in tennis play [10].

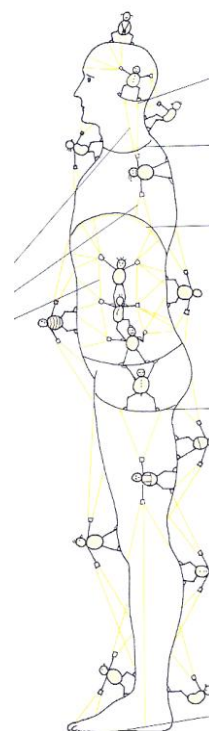
For the athletes physical condition is the sum of physical and mental health, physical potential and the capacity of recovery. Having this on our site we believe that the most important thing is to stay healthy. Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO – World Health Organization).

Many of the injuries that occur in elite and non elite tennis players can be classified as “overuse” injuries. The repetitive demands placed upon the human body from countless hours of training and competition can gradually lead to muscle and/or tendon breakdown. As an example, serves and forehands make up 75% of all strokes during a typical match [7]. Couple this with the fact that players hit with incredible power from virtually everywhere on the court and it is easy to see how players could develop muscular imbalances that could ultimately lead to injury. There are a number of factors that can increase a player’s risk of injury, including overtraining; insufficient strength, power and/or endurance; poor

warm up and cool down; inflexibility; poor aerobic fitness level; incorrect technique and unsuitable equipment [9, 12].

Imagine the small little kids from fig. 1 that pulls every one in different directions. If one of them will pull the muscles or ligaments more or less than usual all the system will be damaged and the result is going to be an injury.

Fig.1



Tennis injuries are of 2 broad types:

•Traumatic injuries (sprains, muscle pulls, fractures, etc) make up about 1/3 of injuries seen in tennis, depending on the age [1] and activity level of the player. Most traumatic injuries occur in the lower extremity. They are not easily prevented, nor are they particularly related to tennis technique.

• Overuse injuries (sprains, tendinitis, low back pain, etc) comprise about 2/3 of injuries experienced by tennis players. Overuse injuries occur in all areas of the body, and may be related to technique or to alterations in the athlete's musculoskeletal system.

Tennis-related injuries are common at all levels of the game - junior, recreational or pro tour. One of the most frequent is the infamous 'tennis elbow' [4]. This is a typical chronic overuse injury. It seems to be associated with lack of forearm strength, or more specifically a strength imbalance between the wrist extensor muscles and wrist flexor muscles. This is particularly true of junior players who suffer from this problem. It is also associated with poor technique, relying on too much arm power to make the shots rather than body rotation. This arm-dominant technique places too much stress on the elbow and wrist joints and hence the injury. This technique-related cause is most common in recreational players. A second frequently seen chronic overuse injury in tennis is shoulder tendinitis [8, 11]. This is often a rotator-cuff impingement injury caused by repeated overhead and inward rotation movements of the arm [6, 7]. This leads to a dominance of the anterior deltoid and pectoralis muscles and a relative weakening of the rotator cuff in rear-shoulder girdle muscles. Mechanically this leads to an increasingly unstable and weak positioning of the shoulder joint, which stresses the joint.

The major evidence relating tennis play to injury suggests that the individual factors create a specific capability to play tennis on an individual level. This capability interacts with the demands that are inherent in high-level tennis. Coaches and medical practitioners should closely evaluate and maximize the individual capabilities as well as understand the inherent demands of the sport in order to reduce injury risk.

There are multiple causes for the overuse injuries in tennis, including the need to perform repetitive forceful motions and strokes, inadequate rest and recovery, incorrect tennis specific conditioning, acquired inflexibility, and strength weakness/imbalance. Each injury may have unique causes that must be evaluated to avoid repeated injury, suggest proper conditioning programs, and allow safe return to sport.

Long-term tennis play has been shown to result in adaptations in flexibility, strength, and strength balance in many areas of the body. The most commonly involved areas include the hip, the low back, the shoulder, and the elbow. As a result, the athlete may exhibit inflexibility in hip rotation, inability to touch

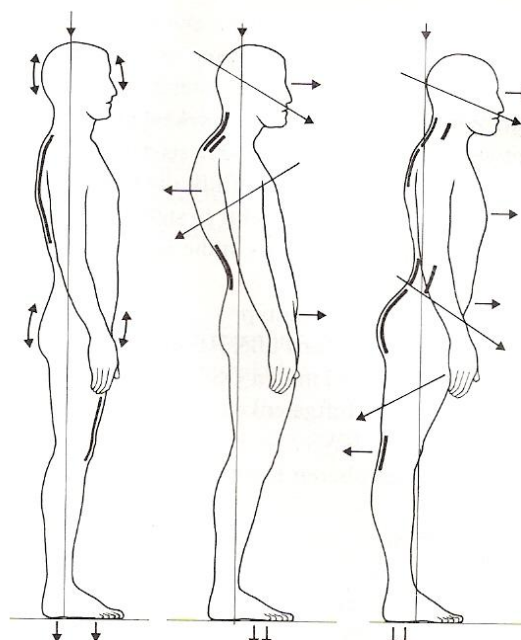
the toes, inflexibility in shoulder rotation, and tightness in elbow extension or forearm rotation. They also may show weakness in trunk or shoulder muscles. These adaptations usually don't produce injury by themselves, but create a less than optimal capability to withstand the inherent physiological or mechanical demands the athlete must face in playing tennis. This creates the process of overload which then can lead to further adaptations, alterations in technique, and alterations in performance, with the potential to cause injury over time, as shown in the diagram of the "negative feedback vicious cycle" of injury.

The role of correct body posture on and off court

A cynic would say that the best sports injury prevention is to not to play sport, but that rather misses the point. Very strict laws of functional economy, physics, biology and chemistry influence all the organic movements of our body.

The stabilization system is well related between system of neurons control, the passive system of bones and ligaments, and, the active muscular system. In this stabilization system are some basic rules like in fig. 2.

Fig. no. 2

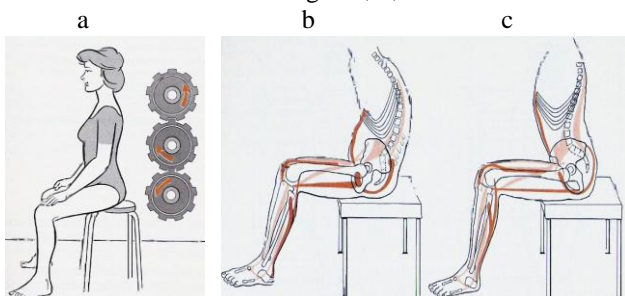


Every articulation has a dominant direction of movement. Neuronal central system tries to keep visual contact on horizontal line and forward. When an articulation loses its mobility, the body compensates using another articulation that has the same dominant direction of movement like the one unfunctional.

For every athlete an important part of the training should be how to prevent illness, especially of

articulation like knee, ankle, wrist or shoulder, and the well function of the muscles that he needs [2, 3]. For all this purpose we believe that there is an answer that comes from mechanics. Think about the teeth wheels that stay one above each other, and try to imagine that there is inside our body replacing the spine (fig. 3a). Why shouldn't the athlete keep this position when training sitting or standing, running or swimming?

Fig. 3 a, b, c



A good position of the spine (fig. 3c) will give maximum protection for spine and other articulation as well as maximum efficiency of abdominal organs, muscles, breathing capacity, best coordination and visibility. Keep chest up and abdominals forward.

Lets not forget that the abdominal organs must be relaxed for the body to be relaxed, so, in fig. 3b they have extremely less space to work properly and they will give to all body more stress than usual and the result for the athletes is less performance. The next inconveniency is that in same fig. 3b the diaphragm will stitch to the organs (liver, stomach etc) and will compress the lungs so the athlete will have less air with each breath in the body, so less air for the muscles that will work very hard. Conclusion, keep the spine in right position (fig. 3c) to have maximum efficiency in the exercises.

Coaching Applications



Coaches should develop a systematic method of measuring and evaluating for the athlete's musculoskeletal base or physical fitness level in order to identify potentially injurious adaptations.

They must know a very important thing: **DEVELOPING STRENGTH IN TRUNK REGION WILL INCREASE THE STRENGTH AT EXTREMITIES WITH NO EXTRA WORK.** Since the athlete's musculoskeletal structure can change over time, either due to growth or as the result of continual play in adults, this **RULE** of the coach and athlete will guide you to big successes.



Warm-up and cool down

Warm up immediately before play is more beneficial for maximal muscle performance and reduced injury risk than static stretching, which should be performed between matches or after a match or practice.

Research shows that flexibility has two components, a static component that relates to how far a joint or muscle can be stretched, and a dynamic component that relates to how the tension within the muscle rises with a stretching action. Both components play a role in preparing for play and in protecting against injury.

The static component is easily measured by standard tests and can be modified by the traditional stretching exercises. It appears that the classic stretch and hold for 15 - 30 seconds technique is a good method of increasing joint flexibility. This type of stretching, however, has been shown by research to be harmful to performance if done immediately before play. This type of stretching should be performed in the cool down after matches and between matches or practices. Static stretching is not recommended during the warm up because it has been shown to decrease muscle strength, maximum muscle activation, and quickness of muscle activation for more than 60 minutes after the stretching ends. Also, classic stretching by itself prior to vigorous activity has been shown to have no effect on muscle or tendon injury protection.

The dynamic component of flexibility may be more related to actual tennis play, and is best addressed by performing a proper warm up. Performing a proper warm-up is essential to both improved on-court performance and reduction in injury risk in tennis play.



"Warm up" is exactly what it says-the internal temperature of the muscles and joints must be elevated to allow maximum pliability of the tissues. Muscle that is warmed through active contractions has been shown to be able to elongate more and absorb

more energy before injury than when the muscle is cold.

The primary principles of an active warm-up are the gradual increase in intensity of muscle contractions, the progression from general to specific activity, and the use of the muscles and joints in positions and motions that will be used in tennis [12]. Tennis players should begin the general activities with whole body

movements such as walking, bicycling, or jogging at low to moderate intensities (40- 60% maximum) for 5 – 10 minutes. Specific activities would include trunk and arm rotations, leg lunges and bends, and racquet swings in all stroke patterns. These should be performed at medium speeds through full arcs of motion. This should be followed by some light hitting. High intensity stroking should only begin after 5 minutes of gradually increasing stroke intensity.

When cooling down the athlete should remember that he has to run for 5 to 10 minutes and after he must take care of the stretching mentioned above.

Periodization

Coaches should also review the athlete's schedule of matches and practice times, and allow sufficient time for rest and recovery within the schedule. A good guideline suggested by many experts is at least 1 full day of rest during each 7-day cycle.

Coaches should be familiar with the athlete's off court conditioning program and should make sure that it conforms to the principles of periodization; this plan should ensure that the players perform sport specific exercises and peak for the important matches.

Conclusions

An injury in tennis happens and will happen from now on. The main thing is to make them happen more and more rare. Our suggestions are keep in mind first when working fitness, conditioning, warm-up and cool down, on and off court: *pay attention for the position of the spine*. Next one is: *developing strength in trunk region will increase the strength at extremities with no extra work*. The most important muscles for a tennis player are abdominal and back muscles.

Having this as a base will help your performers to achieve greater goals, like the following top players that have used them: Patty Schnider, Switzerland (no.12 WTA); Simona Halep, Romania, (winner of Roland Garros 2008, juniors); footballers from FC Zurich, Switzerland; hockey players from NHL, USA; and many other top athletes.

Further researches are necessary to convince the world that these two things mentioned above are essential for the world of sports.

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THE EFFECTS OF MUSIC ON ATHLETIC PERFORMANCE

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ABSTRACT

This paper provides a narrative review of recent theory, research and applications pertaining to the psychophysical effects of music in the sport and exercise domains. Generally speaking, music may improve the performance in physical activity and especially in sports by the beneficial effects it can have on some physiological (heart rate, blood pressure, body temperature) and psychological parameters (rating or perceived exertion) and even on some elements of physical performances (400 metre sprint, the grip strength, endurance capacity, anaerobic capacity). Additionally, it had been seen that the slow music and the fast one have different effects on the body's reaction at physical exercise and the selection of the proper music constitutes the key factor in obtaining some beneficial effects. Synchronous music has been reliably shown to produce an ergogenic effect. Therefore, if athletes or exercisers work in time to music, they will likely work harder for longer. Responses to asynchronous, or background, music are less predictable and beneficial effects are less reliable, although considerable potential remains if certain principles are followed. An example is that fast, upbeat music produces a stimulative effect whereas slow, soft music produces a sedative effect. The findings lead to the possibility that the use of music during athletic performance may yield long-term benefits such as exercise adherence and heightened sports performance, through a superior quantity and quality of training.

KEYWORDS: music, physical exercise, athletic performance.

INTRODUCTION

Music has been widely used to accompany exercise and athletic activity. It has been used to enhance the psychological state of the participants, to establish an effective mindset, to sustain motivation and to resist mental and emotional fatigue, and it may even facilitate physical and athletic performance.

It affects perceived exertion and exertion tolerance through several mechanisms. One is that music synchronizes the exercise pacing, tempo, and rhythm (Abernethy & Batman, 1994; Anshel & Marisi, 1978; Mertesdorf, 1994; Szabo et al., 1999). Another mechanism is that music enhances arousal (Becker et al., 1994; Brownley et al., 1995; Karageorghis et al., 1996), particularly when it has personal meaning for the individual (Karageorghis & Terry, 1997). Thus, music enables one to cope more efficiently with specific exercise modalities and with specific exercises that evoke feelings of pain. Music was also found to affect the mood (Karageorghis & Terry, 1997), self-esteem, and confidence of exercisers (Becker et al., 1994), and also to enhance the production of imagery. These mechanisms may also operate interactively during endurance running (Tenenbaum et al., 2004).

Findings have been equivocal in studies examining the effect music has on performing various tasks. Several studies have shown that up-tempo music has enhancing effects on performance, while slow tempo music had detrimental or relaxing effects (Ferguson et al., 1994; Karageorghis, et al., 1996). Others have shown both uptempo and slow tempo

music have improved performance when compared to a white noise condition (Becker et al., 1994). In contrast, Copeland and Franks (1991) failed to support the claim that loud and fast music enhances physiological and psychological responses in submaximal exercise. They reported that soft/slow music increased treadmill endurance in comparison to control conditions. Brownley et al (1995) studied the influence of music on physiological and affective exercise responses in trained and untrained runners under three music conditions (no, sedative, and fast) during low, moderate, and high intensity exercise. Affective measures during exercise and data collected at voluntary exhaustion revealed a significantly more positive effect among the untrained compared to trained subjects.

Szabo et al (1999) investigated the effects of slow- and fast-rhythm classical music on progressive cycling to voluntary physical exhaustion. The results yielded a significantly higher workload and better efficiency in the slow to fast music condition.

Macone et al (2006) examined the effects of music on mood, state of anxiety, and time to exhaustion during moderate intensity exercise. The findings suggested that women, but not men, reported greater mean fatigue after exercising in the presence of music than in its absence. There is also a body of evidence, which suggests that music does not enhance motor performance. For example, Schwartz et al (1990) reported no significant differences in endurance time during a cycle ergometer task at 75% VO₂ max between stimulative music and control conditions. Pujol and Langenfeld (1999) assessed the effects of

music on performance in the super-maximal Wingate Anaerobic Test. The results showed that there were no significant differences between the conditions for any of the measures.

How Music Wields an Effect?

In the hotbed of competition, where athletes are often very closely matched in ability, music has the potential to elicit a small but significant effect on performance (Karageorghis & Terry, 1997). Music also provides an ideal accompaniment for training. Scientific inquiry has revealed five key ways in which music can influence preparation and competitive performances: dissociation, arousal regulation, synchronization, acquisition of motor skills and attainment of flow (Karageorghis & Priest, 2008).

During submaximal exercise, music can narrow attention, in turn diverting the mind from sensations of fatigue. This diversionary technique, known to psychologists as dissociation, lowers perceptions of effort. Effective dissociation can promote a positive mood state, turning the attention away from thoughts of physiological sensations of fatigue. More specifically, positive aspects of mood such as vigor and happiness become heightened, while negative aspects such as tension, depression, and anger are assuaged (Bishop et al., 2007). This effect holds for low and moderate exercise intensities only; at high intensities, perceptions of fatigue override the impact of music, because attentional processes are dominated by physiological feedback, for example respiration rate and blood lactate accumulation.

A study by Elliott et al (2005) revealed that although music did appear to redirect participant's attention from the internal cues associated with exercise during the early stages of a 20-minute cycle trial, this effect diminished as the trials progressed. Despite this, there was no impact upon exercise intensity. That is, the reduced distractibility of music was not accompanied by a reduction in work rate. Because of these issues, further research should be conducted before definite conclusions could be drawn regarding music induced dissociation and its effect on aerobic exercise. Research shows that the dissociation effect results in a 10% reduction in perceived exertion during treadmill running at moderate intensity (Karageorghis & Terry, 1999; Szmedra & Bacharach, 1998). Although music does not reduce the perception of effort during high intensity work, it does improve the experience thereof: It makes hard training seem more like fun, by shaping how the mind interprets symptoms of fatigue. While running on a treadmill at 85% of aerobic capacity (VO₂ max), listening to music will not make the task seem easier in terms of information that the muscles and vital organs send the brain. Nevertheless, the runner is likely to find the experience more pleasurable.

Music alters emotional and physiological arousal and can therefore be used prior to competition or

training as a stimulant, or as a sedative to calm “up” or anxious feelings (Bishop et al., 2007). Music thus provides arousal regulation fostering an optimal mindset. Most athletes use loud, upbeat music to “psych up,” but softer selections can help to “psych down,” as well. An example of the latter is two-time Olympic gold medalist Dame Kelly Holmes’s use of soulful ballads by Alicia Keys (“Fallin” and “Killing Me Softly”) in her pre-event routine at the Athens Games of 2004 (Karageorghis & Priest, 2008). While the physiological processes tend to react sympathetically to music’s rhythmical components, it is often lyrics or extramusical associations that make an impact on the emotions. If this is the case it is feasible to hypothesise that ‘faster’ music will provide greater ergogenic benefit than music of slower tempi.

Research has consistently shown that the synchronization of music with repetitive exercise is associated with increased levels of work output (Karageorghis & Priest, 2008). Synchronizing movements with music also enables athletes to perform more efficiently, again resulting in greater endurance. In one recent study, participants who cycled in time to music found that they required 7% less oxygen to do the same work as compared to cycling with background (asynchronous) music (Bacon et al., 2008). The synchronization effect in running was demonstrated in an experimental setting by Simpson and Karageorghis (2006), who found that motivational synchronous music improved running speed by ~.5 s in a 400-m sprint, compared to a no-music control.

Hayakawa et al (2000) examined the effects of synchronous and asynchronous music during bench stepping exercises. Subjects were instructed to exercise at 120 beat per minute (30 cycles per minute). The aerobic dance music was synchronous to the tempo, whereas the Japanese traditional folk song was asynchronous. In a control group, only metronome pulse was given. Heart rate in the synchronous aerobic music group stayed at a high level and the rated perceived exertion was higher than the non-music group. The subjects in the synchronous aerobic music reported vigor feelings significantly more than the other two groups.

The use of synchronous music takes a great deal of preparation as the motor patterns of training activities and preferred motor rhythms of the athletes need to be studied carefully before selections are made (Terry & Karageorghis, 2006). However, there is limited research and specific theory underlying the use of synchronous music, rendering this a particularly fruitful area for further investigation.

Music is believed to improve athletic performance

Most previous research efforts examining the ergogenic effects of music have been confined to controlled laboratory environments (Anshel & Marisi, 1978; Copeland & Franks, 1991; Brownley et al.,

2005; Szmedra & Bacharach, 1998) and only few study addressed the effects of music in an ecologically valid (Pates et al., 2001; Simpson & Karageorghis, 2006; Hume & Crossman, 1992; Eliskim et al., 2006; Bishop et al., 2007). The use of music interventions is limited by the rules of governing bodies of sport. In many competitive situations it is logistically very difficult to incorporate music. However, music could be used during training, during the pre-match routine, during time-outs or half-time intervals.

For example, Pates et al (2001) investigated the effects of pre-task music on flow states and shooting performance among three netball players. Two participants experienced increase perceptions of flow and all three improved their netball shooting performance. Participants also reported that the intervention had helped them to control the emotions and cognitions impacting upon their performance. The authors concluded that interventions including self-selected music and imagery could enhance athletic performance by triggering emotions and cognitions associated with flow state.

Simpson and Karageorghis (2006) studied the effects of synchronous music during 400 m track running. The aim of the present study was to investigate the effects of motivating and oudeterous (neither motivating nor demotivating) synchronous music on 400-metre sprint performance while controlling for the potential confound of pre-performance mood. Their results showed that both motivational and oudeterous music elicited faster times than no music, but times associated with the two music conditions did not differ; suggesting that the motivational qualities of music are not of critical importance when it is being used synchronously. It appears that synchronous music can be applied to anaerobic endurance performance among non-elite sportspersons with considerable effect.

Hume and Crossman (1992) determined whether music could be used as a reinforcer for increasing productive and decreasing nonproductive behavior of 6 competitive swimmers during the dry-land portion of a practice session. During contingent reinforcement, music was played on the first day after an appropriate productivity level was achieved. A 15% improvement in productivity was selected because it was deemed to be a realistic goal that would triple the productivity level achieved during the baseline phase. The swimmers in this group were told that when their dry-land training performance improved to the criterion, the music would be resumed at practices.

Eliakim et al (2006) found that elite adolescent volleyball players who heard pop songs during a 10-minute stationary-cycle warmup performed better on a test of their anaerobic power than when they had warmed up without music. The young athletes (12 male and 12 female) underwent two separate exercise sessions a week apart, one of which involved warming up with music. The researchers tested anaerobic

performance by having the athletes pedal as hard as they could on an exercise bike for 30 seconds. Athletes' heart rates were higher when they warmed up with music, and they also perceived themselves as having worked harder. Peak performance on the test of anaerobic power also was higher. On the other hand, the music didn't affect average anaerobic power or the time it took study participants to feel fatigued. Anaerobic performance peaked in the first 5 seconds of the 30-second test, the researchers note, suggesting the beneficial effects of music are transient.

The aim of another study was to elucidate young tennis players' use of music to manipulate emotional states (Bishop et al., 2007). Participants (N=14) recorded their emotional responses to music heard during interview and discussed their reasons for selection. Results indicated that participants consciously selected music to elicit various emotional states; frequently reported consequences of music listening included improved mood, increased arousal, and visual and auditory imagery. The choice of music tracks and the impact of music listening were mediated by a number of factors, including extramusical associations, inspirational lyrics, music properties, and desired emotional state.

In conclusion, this results suggest opportunities to use music should be sought to maximise the performance of sportspeople. Further study is required to enable music interventions to be accepted by the sports science community on the basis of strong empirical evidence.

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MODERN CYCLING: PART SPORT, PART SCIENCE

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ABSTRACT

Managing performance improvement requires a careful examination of the theories of all-round preparation, in order to identify those which correspond more closely with reality and those which may require amendment in the future. A study of the training programmes used in the more advanced sporting countries, along with the historical data, allows a precise definition to be drawn of the features which have given rise to such increased progress. In terms of the components of an athlete's physical preparation regime, I would certainly recommend use of the gym, and “dry training”, for general muscular training consisting of stretching and “soft” training to various intensities for general muscle groups, such as the abdominals, dorsals, iliopsoas, biceps, triceps and so on.

KEY WORDS: modern cycling, part sport, part science.

PHYSICAL TRAINING IN AMATEUR CYCLISTS

Trends and developments in training methodologies for endurance sports

The evolution of training methods

I believe it will be useful to refer briefly to how training has evolved, so as to offer a better understanding of the almost exponential acceleration in methodological and educational developments in sport in recent times, and the significant progress made in amateur sport in particular.

In recent years, the continual improvement in performance at all levels, from elite to amateur, has in fact engendered the necessity, but also the desire, for continuous improvement in all aspects of athletic preparation. Managing performance improvement requires a careful examination of the theories of all-round preparation, in order to identify those which correspond more closely with reality and those which may require amendment in the future.

The period from the second half of the 1960s until recently has been marked by a rapid enhancement in sporting performance, especially at elite level, with continual improvements in records and a general intensification of competition.

Instead of flattening off, as had been predicted in the past, sporting performance levels are continuing to rise, indeed at a faster rate than before in some disciplines. This is the case, for example, in track and field athletics: in the 1982 European Championships, in fact, world records were broken in nine individual events out of twenty-one (i.e. in 42.9% of events); this percentage was even greater in swimming and cycling, and was as high as 80% in ice-skating that year.

It was not long ago, in most sports, that there were only one or two athletes with a realistic chance of winning; we are now seeing competitions in which, come the final, it is difficult to pick a favourite.

A study of the training programmes used in the more advanced sporting countries, along with the historical data, allows a precise definition to be drawn

of **the features** which have given rise to such increased progress.

The *first feature*, and its role is fundamental, is a **rapid increase in the amount of work** dedicated to training. The table below (1) provides some examples. It can be noted that the main indicators of the work undertaken over the course of a year have seen a twofold increase in about fifteen years.

Some athletes have achieved extraordinary results after putting in considerable amounts of work, including as much as 12,000 km per year in canoeing, **40,000 km in road cycling**, and 4,000 km in swimming.

Table 1 – Changes in training workload in elite athletes (cyclic sports)

Indicators of training workload	Sporting disciplines					
	Middle-distance running	Long-distance running	Swimming	Canoeing	Cycling (track)	Cycling (road)
Late 1960s						
Workload, km	3000	4000	1800	2000	13000	20000
Number of training sessions	200-220	190-200	200-230	200-240	220-290	200-250
Early 1990s						
Workload, km	6500	8500	3300	6000	22000	35000
Number of training sessions	500-550	550-600	550-600	500-550	550-600	500-550

It must indeed be noted, however, that this increase in workload is not always a guarantee of success: this is borne out by the **stagnation in the results** of many teams and athletes, even if various other factors also come into play, such as the growth in the frequency of competition, with consequent overload of the body's functional systems or locomotor apparatus, and other issues which will not however be discussed in detail here.

It is certainly beyond doubt that at full senior level this **increase in training workload** may sometimes be quite without method or reason, thus rendering it pointless, by allowing a superior level of performance to be reached more rapidly, **but at the expense of impairing the crucial and fundamental process of adaptation** for a number of functional systems, including their ability to improve and/or develop fully.

This, moreover, clearly exerts a negative influence on the development of strength and speed.

This has all persuaded many coaches and athletes to return to the workload levels of 1975-76 from the peaks reached in the early 1980s.

- *The second feature* consists of adapting the training work to the desired goal. This translates into an increase in the amount of specific training and an increase in the workload dedicated to general training. General work ceases to be dominant; it is therefore primarily used as a means of active rest.

- *The third feature*, closely associated with the second, is the development of new methods of training. It can be seen in the use of materials and equipment designed to stretch the body's functional reserves to the full and to provide a closer approximation than was previously possible to the perfection of movement technique and, more generally, to optimize performance. Currently, physical attributes are developed whilst working on technical skill, training being structured in such a way as to utilize functional resources to their maximum potential, or at any rate to

create very high, if not full, muscular tension, whilst intensifying the adaptive processes via a medium-term plan, work at altitude, etc.

- Finally, the *fourth feature* consists of perfecting – or optimizing, which is perhaps a more accurate term/concept – the structure of the training.

Through an analysis of the development of current practice, it can be stated that, over the next few years, the key feature of the optimization of training will presumably be a tendency for its scientific basis to become established on a firmer footing, even though it should be remembered that the same thing was also being said a few years ago. It needs to be borne in mind, however, that although the work at a scientific level has effectively reached a very advanced stage, this is not always the case from a methodological-instructional perspective, although not as far as the quality of the methods used is concerned, which appear however to be of a good standard, but rather in relation to their appropriateness of use in one case as opposed to another.

It is, however, by considering both the scientific evidence and the methodological-instructional experience together that the most suitable training regimes can be designed, in order to target the athlete's development and to achieve the most effective preparation for the intended goal.

This was a **necessary introduction**, to my mind, given also that it is my personal view that the extent of the **quantitative** if not qualitative **distinction** between athletes of a certain standard, apart of course from those at the elite and super-elite levels, and amateurs, has genuinely reduced.

It is a strong belief of mine that it may be said that although the amateur cyclist, in our case, bows to the undoubted qualities of the medium- and high-calibre cyclist in terms of age, goal levels, and sometimes individual preparation time and quality, they are often on an equal, if not superior, footing in terms of motivation (even though it should not be that

way, for example in relation to younger riders), passion and sheer commitment to their sport. In my experience in sport, this is almost always the key to achieving great results, or at least personal satisfaction, whatever the level involved.

Therefore, with due care and consideration for all the subtle distinctions and caveats involved, it seems to me that particular attention should be given to the athletic activities of the amateur cyclist, with a view to devising a preparation which is complete and tailored to the individual characteristics of the athlete in question.

I firmly believe that there is a real opportunity to design a training regime in this field, starting of course, as I said, from a personalized programme tailored for the individual's particular requirements, by selecting more professional training methods such as structured approaches, education and preparation for pre-set goals, however small. This will also contribute to the avoidance of frequent problems such as unwanted illness or injury caused by too much or not enough work, which can arise fairly often in amateur circles in general.

If this article could spread one concept, it would most usefully be that of a **structured and monitored methodical approach** to training, which should be **followed**, and should not be "homemade", even in the amateur world.

Last but not least, considering that amateur cyclists often tend to be of quite a high average age, in relation to the average among those who may properly be called "true" athletes and the often "generous" dedication shown by the latter, I would see the medical and health aspect of the question as one of some significance. That is, the probability of successfully dovetailing the amateur enjoyment side of a healthy sporting interest with the physical wellbeing which a **correctly performed motor activity** will most definitely bring about, as is well known, appears to me to be of no little importance.

Physical preparation – guidelines

First of all, it must be noted that every athlete is an individual, with their own particular goals and above all with their own **particular unique features**. This means that it is unlikely that a programme will be good for every athlete, or even for most athletes. The programme will therefore need to be individual, to be established by the trainer after assessing the athlete (and in particular their goals) and, above all, after "testing" via an adhoc evaluation protocol, to establish as accurately as possible the type as well as the amount of work to be undertaken.

Organic conditioning and general and specific muscle conditioning

The best results will most probably derive from an appropriate combination of these. The aim is to "enhance" the athlete's natural "gifts" whilst also improving their "weak points", allowing the athlete to

improve year on year within their own physiological and age limits towards the "total performance" which can make the difference in training and in competition, whether to triumph outright or simply to triumph in the challenge with oneself, which is often what is important for amateur athletes.

Normally, for novices at physical training and/or post-competitive sport (ages 15-40) to achieve **their best athletic performance**, a certain amount of time is required, say a minimum of three years, under the careful supervision of a professional trainer – or the athlete themselves, if they are one and the same – in order to maintain over time the all-round and performance health achieved using the specific training method.

Therein lies the difficulty, and I do not think it is appropriate to prescribe the standard schedules and/or programmes without having studied and "tested" the athlete in question.

It can be simply stated that, in order to achieve "maximum performance", optimised for the individual, there must be a customised programme, "calibrated" above all with carefully calculated periods of rest as well as work, in addition to the "right" stimuli (never too much but never too little either) specific to that athlete.

It is therefore critical, even at amateur level, periodically to check the athlete's work in "tests", perhaps even in the laboratory. The more "professional" they are and the higher their goals and workloads, the more necessary it is to monitor and keep control of the athlete's data, checking on all relevant parameters as required. It will therefore be useful to check their anaerobic threshold, work capacity in anaerobic conditions (in Watt), lactate and all blood parameters, through regular blood samples taken at predetermined points in the year. Furthermore, the monitoring must also cover the physical attributes which we are aiming to develop, so that, for example, the development of maximum strength is tracked equally carefully, always using loads commensurate with the level of the individual athlete.

It seems worthy of note that due attention should also be given to information such as how the athlete feels subjectively, and any psychological implications, which may be an important barometer to aid in the understanding of the experience of our athlete, so as to be able to set their workload more accurately.

The key, however, to training work at all levels is the **motivation, or self-motivation** which the trainer (or the athlete themselves, in the latter case, as with amateur cyclists) is able to provide.

It is well known that a well-motivated athlete learns faster and takes challenging workloads in their stride, without thinking about the actual amount of effort involved; it can therefore be stated with certainty that the athlete's psychology plays a crucial role in high-level performance.

Technical notes

In terms of the components of an athlete's physical preparation regime, I would certainly recommend use of the gym, and "dry training", for general muscular training consisting of stretching and "soft" training to various intensities for general muscle groups, such as the abdominals, dorsals, iliopsoas, biceps, triceps and so on. Above all, though, I would warmly recommend a specific work-out involving suitable weights for those muscle groups which I would describe as specific and closely connected, such as the quadriceps, ischio-crural and gemellus muscles.

Also not to be forgotten would be exercises for a fairly explosive kind of overload training, which in my opinion could make all the difference, such as work with suitably weighted barbells, jumps and combinations thereof, as suggested by the ample educational literature on the subject. This would facilitate a more opportune approximation of the characteristic technical/physical aspects of cycling, like the pedal action, which at every revolution, or at least at the start of it, should repeat with a thrust which in my view will then **characterize** the rhythm of the whole revolution and, along with the resistance to this action, the specific quality of performance of the action in general. In essence, I would combine the specialist training of the cyclist's physical prowess with specific training in the movement technique involved. Hence, as per the above, pedal action combined with aerobic exercises in the gym for general and specific endurance, increasing the workload along with improvements in strength with overload sessions specifically for the aforementioned muscle masses, using exercises of a primarily explosive nature. I would also suggest considering plyometric-type exercises, for their features which in my view offer a good basis for addressing the needs of the cyclist, such as the effect of the pre-stretching, which varies according to the type of fibre involved; the improvement of movement performance brought about by movements preceded by pre-stretching is also due to the contribution that the stretching makes to the reflex, and furthermore muscular efficiency is governed by factors associated with work time, which is saved by the use of pre-stretching.

I would add the general note that, in order to use one's body in the most appropriate way, a careful warm-up should always be carried out before any training session. One should always be well rested, apply one's full concentration, stop exercising immediately in the event of muscular pain, and not train more than two or three times a week.

Recovery

There now follow a few points to note in relation to recovery, between exercises, between the various types of instructional technique deployed, e.g. repetitions, or between and after training sessions or competitions.

As mentioned a little earlier, it is fundamental that the athlete must learn to accord the necessary fundamental importance to recovery.

Sometimes, and particularly within the amateur fold, where the tendency is to want to put in huge amounts of work and not spare oneself, as already noted, recovery is often erroneously thought of as a simple rest period without activity, however it is not only that.

The use of approximate or poorly calculated breaks often equates to undermining the active work done with passive work (i.e. the recovery) which is insufficient, and in the worst case even counterproductive, especially at amateur level, regardless of age.

The parameter most usually used to calculate the extent of useful recovery is, as is well known, heart rate, which needs to return to a given figure, for example in a training session aimed at improving oxygen transport, which depends essentially on the level of heart function, whereas for a session of repetitions for an athlete who is sufficiently educated in athletic terms, a good reference point is always the impressions of the athlete themselves.

It would have been interesting to explore some of the more specific details on the subject, however I hope to be able to do so with you another time.

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DOES CALLISTHENIC EXERCISE AFFECT THE RELATIONSHIP BETWEEN BODY COMPOSITION AND LUNG FUNCTION IN WOMEN?

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ABSTRACT

Body composition changes with exercise, with increases in skeletal muscle mass and declines in fat mass and visceral fat. On the other hand, lung function also increases with exercise. It was reported that respiratory muscle strength and lung function are closely associated with body weight and lean body mass in patients with chronic obstructive pulmonary disease (COPD) (Butland et al., 1982).

OBJECTIVE: The purpose of this study was to investigate the effects of relations between body composition parameters and lung functions including VC, FVC, FEV1, FEV1/VC, FEV1/FVC after 6-months callisthenic exercise program in healthy women.

RESEARCH METHODS AND PROCEDURES: 35 healthy subjects' age and height means were determined 41.69±7.69 years, 156.51±4.72 cm and voluntary women participated to this study. All subjects took 50-minutes/sessions, 3-day per week and 24-week callisthenic exercises were performed to. The intensity of the exercise was determined with 80 % of heart pulse by Karvonen method. Anthropometric and body composition (including fat mass (FM), fat free mass (FFM), and percentage body fat (%BF)) evaluated by using the skinfold methods and lung function was examined by using spirometry. Means and standard deviations of all measurements were calculated for female. 3rd and 6th months exercise periods differences were determined using One-Way ANOVA for repeated measures. Pearson correlation coefficient analyses were performed to analyze relationship between variables.

There were significant decrease in body weight, body fat percentage, body fat mass and body fat free mass ($p<0.01$) after exercise period. Lung volume and capacity values (VC, FVC, FEV1, FEV1/VC, FEV1/FVC) were increased significantly ($p<0.01$, $p<0.05$) after 6-month exercise program. There was a significant relationship between the body fat percentage and FVC and MVV values of women negatively ($p<0.05$, $r = -0.56$, $r = -0.40$). Also it was found that a negative relation in the BMI and FVC and MVV of subjects ($p<0.01$, $r = -0.43$, $r = -0.49$).

RESULTS: There was significant increase in VC, FVC, FEV1, FEV1/FVC and MVV values of women after 24 week exercise period ($p<0.01$). There was significant decrease in body mass, body fat percentage, fat mass and fat free mass values of subjects after exercise. Our study showed that body composition and fat distribution were associated with lung function in women in that a general pattern of fat distribution correlated negatively with lung function.

DISCUSSION AND CONCLUSIONS: Moderate intensity, long-term and regular aerobic exercises were effective on burning fat so it can be thought this kind of exercise caused a decrease in body weight, the percentage of body fat and body mass index (Cox et al., 2001; Guo et al., 1999).

In conclusion, there were positive effects as evident on women lung volume and capacity with callisthenic exercises. This study showed that the decrease level of fat percentage and BMI would be affected the lung functions in a negative way.

KEY WORDS: body composition, lung volume, exercise, women.

Introduction

Body composition changes with exercise, with increases in skeletal muscle mass and declines in fat mass and visceral fat. On the other hand, lung function also increases with exercise. It was reported that respiratory muscle strength and lung function are closely associated with body weight and lean body mass in patients with chronic obstructive pulmonary

disease (COPD) (Butland et al., 1982). A central pattern of fat distribution is negatively associated with lung function in healthy adults (Beatty et al., 1985; Karacan et al., 2008). Most population studies that examined the relation between obesity and lung function used body mass index (BMI) as a measure of overall adiposity, and no significant or weak associations have been reported, with diminished long

function at both extremes of the BMI distribution (ie, thin or obese) (Maiolo et al., 2003; Lazarus et al., 1998). The aim of this study was to investigate the effects of relations between body composition parameters and lung functions including VC, FVC, FEV₁, FEV₁/VC, FEV₁/FVC after 6-months callisthenic exercise program in healthy women.

METHODS

Subjects: 35 healthy subjects' age and height means were determined 41.69 ± 7.69 years, 156.51 ± 4.72 cm and voluntary women participated to this study. All subjects provided informed written consent, and the investigation was carried out in accordance with the Declaration of Helsinki. All tests were implemented by the same trained technician, offering standardized verbal encouragement during each test. The research was approved by the Scientific Research Ethics Committee at the University of Gazi, Ankara.

Exercise Program: 80 % of heart pulse exact 24-week, 3-day per week and 50-minutes/sessions aerobic and callisthenic exercises were performed to subjects. The intensity of the exercise was determined by Karvonen method (Fox et al., 1988). Exercise program was composed of 10 minutes warm-up exercises, 25 minutes aerobic exercises, 10 minutes exercises for abdomen, hip, leg muscles and 5 minutes cool-down and stretching exercises.

Anthropometry: The anthropometric measurements included in height, weight, fat mass (FM), fat free mass (FFM), and percentage body fat (%BF) of subjects. Subjects were measured in light clothing without shoes. Height and weight were both measured standing. Height was measured with a Harpenden stadiometer (Critikon Service Center, Reading, United Kingdom) to the last complete 0.1 cm and weight with a Soehnle digital electronic scale to the last complete 0.1 kg. BMI (in kg/m^2) was calculated for each subject. Skinfold thicknesses were taken at two sites (triceps

and suprailiac) using Clifton N. J. calipers. Percentage body fat and subsequent fat free mass were estimated using Sloan and Weir's equation (Kyle et al., 2001).

Lung Function: After instruction and a practice attempt, each subject performed a minimum of 3 forced expiratory maneuvers to provide estimates of forced vital capacity (FVC) and FEV₁. FVC is the maximum volume of air expired during forced expiration and is primarily an indicator of lung volume (Enright et al., 1991). FEV₁ is the volume of air expired in the first second of forced expiration and is influenced by lung volume and airflow obstruction. A Vitalograph Compact Spirometry (Vitalograph Ltd, Buckingham, United Kingdom Serial No: S 49282) was used, which was calibrated at least twice a day by using a precision syringe. Spirometry was performed under standard conditions of body temperature and ambient pressure and with water vapor saturation. Measurements were made with use of a closed-circuit spirometer (Vitalograph spirometer Serial No: S 49282) with the subjects sitting down and wearing a nose clip. Each subject performed 3 acceptable FVC maneuvers according to the American Thoracic Society recommendations (American Thoracic Society, 1994). The largest FVC and FEV₁ values were recorded after examining the data from all the acceptable curves, even if they did not come from the same curve (Enright et al., 1993; Schmidt et al., 1973; Mohamed et al., 2002).

Statistical Analyses: The data were analyzed using the Statistical Package for the Social Sciences (SPSS version 10.00) Descriptive statistics were calculated for all variables and are reported as means \pm standard deviation (SD). 3rd and 6th months exercise periods differences were determined using One-Way ANOVA for repeated measures. Pearson correlation coefficient analyses were performed to analyze relationship between variables. Statistical significance was set at $p < 0.01$ and $p < 0.05$ for all tests.

RESULTS

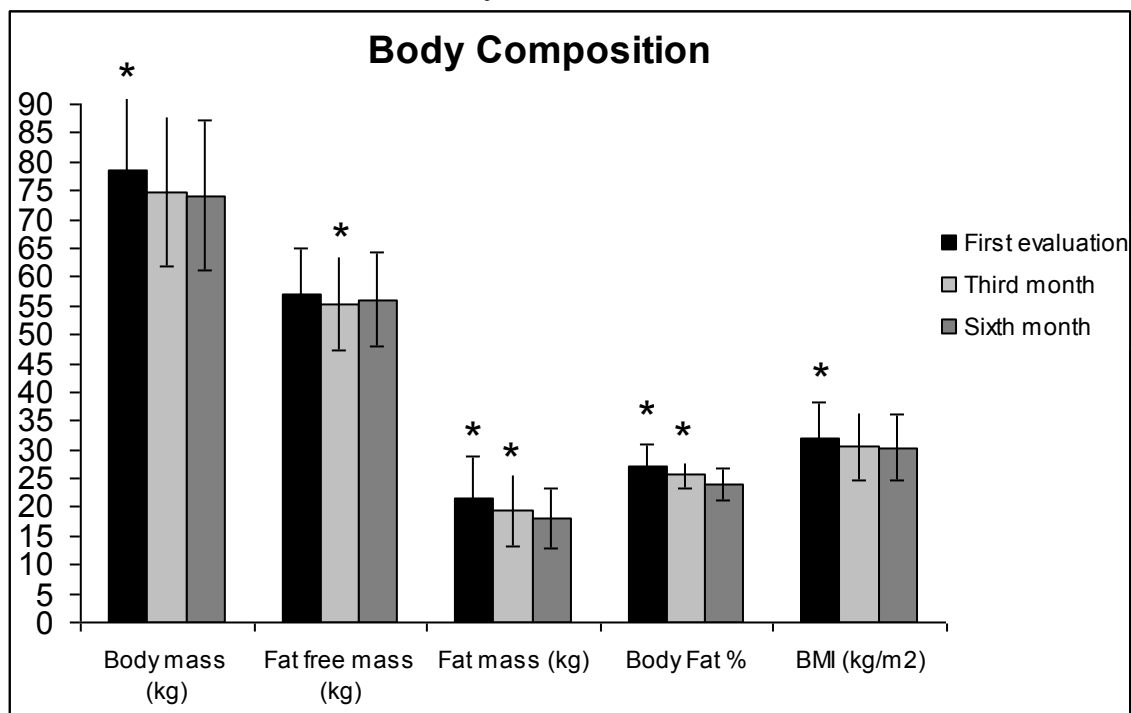
Table 1. Lung capacities of the subjects.

	X \pm SD		F	p	Significance
VC	1	2.81 \pm 0.42	4.51	0.01	1-2
	2	2.96 \pm 0.47			1-3
	3	2.95 \pm 0.50			
FVC	1	2.86 \pm 0.41	9.02	0.00	1-3
	2	2.90 \pm 0.38			2-3
	3	3.01 \pm 0.38			
FEV ₁	1	2.54 \pm 0.35	10.78	0.00	1-3
	2	2.55 \pm 0.32			2-3
	3	2.69 \pm 0.34			
FEV ₁ /FVC	1	88.80 \pm 5.97	6.83	0.01	2-3
	2	87.57 \pm 5.86			
	3	91.42 \pm 6.62			
MVV	1	93.62 \pm 19.27	16.18	0.00	1-3
	2	100.94 \pm 21.67			2-3
	3	108.58 \pm 18.50			

1: Pre-exercise 2: After 3rd months exercise periods 3: After 6th months exercise periods

There was significant increase in VC, FVC, FEV1, FEV1/FVC and MVV values of women after 24 week exercise period ($p < 0.01$) (Table 1).

Figure 1: There was significant decrease in body mass, body fat percentage, fat mass and fat free mass values of subjects after exercise.



$p < 0.05^*$

Figure 2: Negative correlation between percentage body fat and FVC for women ($r = -0.56$ $p < 0.01$).

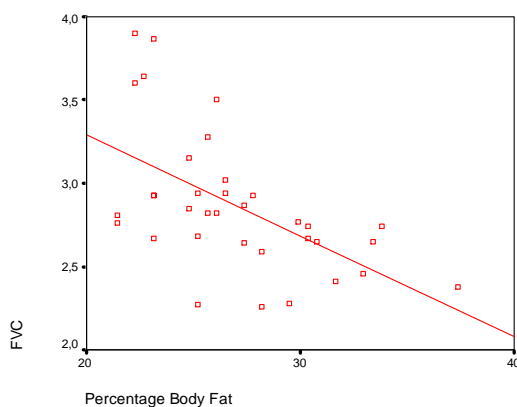


Figure 3: Negative correlation between BMI and FVC for women ($r = -0.43$ $p < 0.01$).

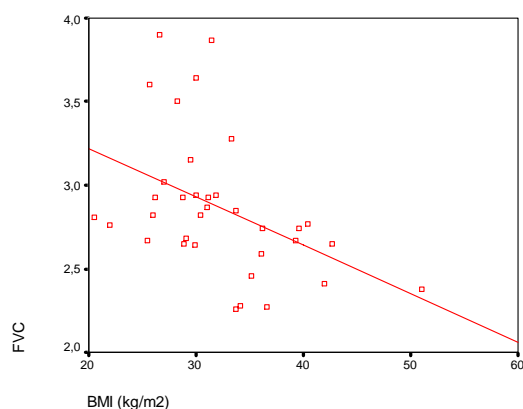


Figure 4: Negative correlation between BMI and MVV for women ($r = -0.49$ $p < 0.01$).

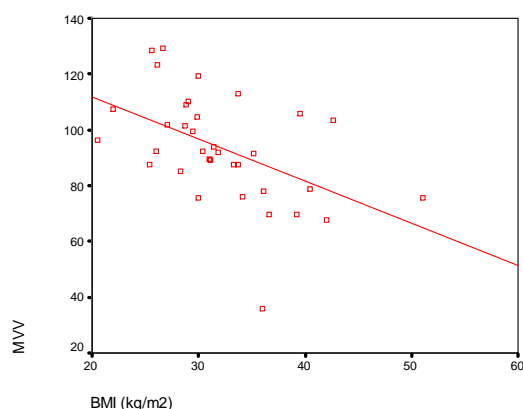
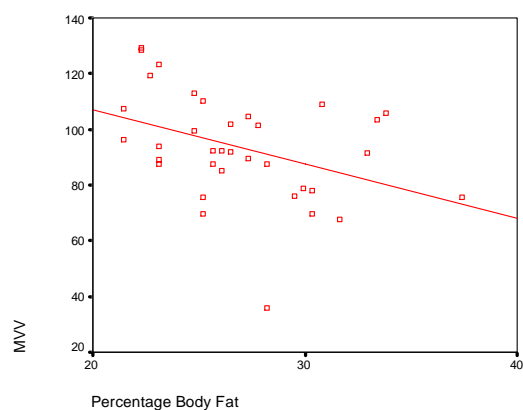


Figure 5: Negative correlation between percentage body fat and MVV for women ($r = -0.40$ $p < 0.05$).



DISCUSSION

Our study showed that body composition and fat distribution were associated with lung function in women in that a general pattern of fat distribution correlated negatively with lung function. Our findings of a significant negative correlation between percentage body fat and FVC and between FVC and FEV₁ expand

on and complement the findings of previous reports (Maiolo et al., 2003; Lazarus et al., 1998; Marion et al., 2001). There was significant decrease in body mass, body fat percentage, and fat mass and fat free mass values of subjects after exercise. Also there was significant increase in VC, FVC, FEV₁, FEV₁/FVC and MVV values of women after 24 week exercise period ($p < 0.01$)

A reduction in lung capacity may impact upon breathlessness due to the requirement of an elevated respiratory rate and a greater work output from the respiratory muscles (Watsford et al., 2007). Such an increase may affect physical performance and quality of life accordingly (Janssens et al., 1999). It has been reported that decreases to spirometry variables may be partially attributed to the age-related loss in muscle mass of the respiratory muscles [Watsford et al., 2007; McConnell and Copestake 1999].

FEV1 depends on the strength of respiratory musculature and vital capacity, both of which are likely to improve with physical activity. Lean body mass, which is related to physical exercise and respiratory function, decreases with advancing age and after menopause.(Choi and Pai, 2004)

In many studies, long-term and moderate intensity aerobic exercise program was performed to sedentary women and at the end of the program; it was obtained great changes in their body composition. (Asikainen et al., 2002; Carmeli et al., 2003; Restrepo et al., 2003; Slentz et al., 2004). In general, the ability of exercise to induce changes in body weight, FFM, and fat mass is affected by various factors, including the type, intensity, frequency, and duration of exercise (Ballor and Keesey, 1991).

Moderate intensity, long-term and regular aerobic exercises were effective on burning fat so it can be thought this kind of exercise caused a decrease in body weight, the percentage of body fat and body mass index (Cox et al., 2001; Guo et al., 1999).

In conclusion body composition correlated significantly with respiratory parameters. It was seen that callisthenic exercises included aerobic and gymnastic activities caused negative correlation between the body fat percentage and FVC and MVV values in middle-aged subjects. Also it was found that a negative relation in the BMI and FVC and MVV of subjects. It was determined that after this kind of exercise beneficial changed the body composition and lung function in middle-aged female.

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THE USE OF VIBRATING PLATFORMS FOR PERFORMANCE IMPROVING

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ABSTRACT

In these last years the use of vibrating platforms has spread even more in the fitness world. A big emphasis is given, in many advertising campaigns, to the advantages of training with vibrations, especially for obtaining a muscular and slim body. Which are its real benefits and potential risks?

KEY WORDS: vibrating platforms, improving performance.

Use of vibrations in sport activities.

Vibrations, in general, represent an element our body is in constant relationship with. *Is defined as vibration the high frequency oscillation (permanent, weak, or forced), propagating in a physic system through transversal or longitudinal waves.*

If we observe the surrounding environment, we will inevitably notice that we always undergo the effect of vibrations, which can be obviously of various nature and can generate various sounds and movement. The same phonation of a person depends on the vibration of his vocal cord; when running, a person produces mechanical vibrations at a frequency between 10 and 20 Hz, when we stay on a tram or in the car we absorb the vibrations produced by the means of transport, etc.

If we analyse under a mere theoretical point of view a free vibration, not subjected to dispersions, we can notice that its movement is periodic and regular. For example, if we connect a weight (from now on called **mass**) to the free extremity of a spring fixed to the ceiling, we place the compressed spring at the

initial moment, and we let go the mass, we will observe some periodic and regular oscillations. Every oscillation will have a **movement** characterised by **amplitude** and **period**. In particular, the amplitude is given by the movement range and the period is given by the complete cycle realized by the mass.

The number of complete cycles in the time unit allows finding the vibration **frequency**, measured in **Hz** (Hertz).

So, speaking about vibrations, we can find their frequency. Starting from the formula $f = 1/T$ (where f is the frequency and T is the period related to one second) we would say that, if the mass fixed to our spring makes a complete oscillation in 0,05 seconds, the vibration we observe has a frequency of **20 Hz**.

The typical vibrations of a **vibrating platform** are mechanically produced, therefore they are regular. This allow us to find their frequency in **Hz** (number of oscillations per second) and their amplitude in **mm** (maximum displacement of the surface), and starting from these parameters we can also obtain the speed and

acceleration expressed in **g** ($g = 9,81 \text{ m/sec}$) of the mass, that in this case is represented by the subject who undergoes the vibrations.

When our body undergoes some vibrations, the exposure time and the vibration frequency generate various reactions, adaptation processes or compensation to vibrations. These organic answers are not always and not necessarily positive nor they involve all sports fields.

On the contrary, the specific use of vibrations for improving the physical aspect is still object of far and opposite opinions. In other words, despite the advertising campaigns made by those who sell the actual vibrating platforms, nothing sure about their possible benefit emerges from the scientific world. Not to speak about the big difference between vibrating platforms used in an academic and experimental environment, and vibrating platforms sold or used with imprudence in the common fitness centres (which for example are not provided with electromyograph for detecting the correct frequency of the individual work). About these last we can highlight some important opinions which state: *Despite the undoubted potential of the “vibrations” phenomenon they are **real frauds***. Even without mentioning frank opinions, it is unavoidable underlining that the subject is very complicate despite appearances. For example on the hormonal level, near the studies which state that this training generates a reduction of cortisol, we find others which state that for frequencies close to 30 Hz, the plasmatic concentration of cortisol increases (Ariizuma and Okada, 1983). The increasing of testosterone and GH, highlighted by other authors, even though real, is not however sufficient to activate slimming processes or significant increasing of the energetic metabolism.

It is sure that the use of vibrations for **improving** any physiological or sports feature, cannot disregard a deep knowledge of the vibrating training, of the **kind of platforms** to use, of the duration of every stress, of the number of **repetitions**, of the platform **frequency**, etc. etc. All elements very far from a “self-use” of these equipments, or from the reliance on staff not trained to work with vibrations which, is obvious, under specific conditions can generate **unwanted** and even very severe **effects**.

For having a more precise idea of how complex an applicative scientific protocol can be, it is sufficient to refer to the study that brings Carmelo Bosco (one of the first scientists of training with vibrations) to affirm that this application can improve the explosive strength performances of the lower limbs, implies the intervention with sinusoidal vibrations at a frequency of 26Hz, more times a day, of 90 minutes each.

The application of vibrations can be compared to a fast sequence of muscular contractions (eccentric and concentric) applied to the muscle at a frequency of 10-200 Hz (therefore very lower frequencies if applied to a person) which can cause an increasing in the

strength expression of the involved muscular regions, as a consequence of the neuromuscular spindle activation that is supposed to positively interfere with the **recruiting potential** of the muscular fibres involved in a voluntary concentric contraction, and in the higher **discharging frequency**, able therefore to activate also the FT fibres. Therefore we are talking about an effect mainly due to temporary adaptations on a neural level, associated to a better coordination of the muscles involved in a certain gesture, and to the better inhibition of the antagonistic muscles.

Frequencies close to 18 Hz can be a valid aid in works aimed to improve the articular movements through a stretching of muscular tendinous structures. The induced muscle relaxation helps and assists the common stretching sessions.

Furthermore the intensity of improvements remarkably changes between trained and sedentary people and further and more recent studies show that the above described adaptations are not only transitory but, more precisely, they are temporary and potentially instable if not supported by classical training methods. So in this perspective the use of vibrations can constitute a further advantage for sportsmen who intensely and regularly train themselves, while they constitute a much less valid system for others.

With regards to the intensity of strengths we undergo when training with vibrations, it is easy to be subjected to accelerations even 10/20 times higher than the **gravity acceleration**. In any case, even without reaching these levels, it is evident that the strengths involved act even on the bones level. Here the use of the vibrating platform probably plays its **most significant** role. On the other hand the study of vibrations and of their application has started for preventing and treating the bones demineralization processes.

In fact it is known that the compression strengths originated by the muscular activity have an **osteogenic effect** on the bone density; more in general, all the activities generating a sudden change in the muscle length, with consequences on the bones structure, (ex.: skipping-rope) or a compression (ex. exercises with overloads) positively influence the bony mass. Therefore even the use of vibrations can exercise its effect by contrasting the demineralization processes and by being effective also on osteoporotic subjects, especially if their conditions (for example a strong overweight) or their muscular functionality do not allow doing intense activities or using proper overloads. These features are often present in elderly subjects, on whom a correct use of vibrations can have good effects also on the improvement of peripheral circulation and on muscular hypo tonicity.

The evaluations of some possible negative effects related to vibrations is also extremely interesting. The difficulty of coordinating the body when moving on a vibrating platform could in fact cause a transmission of vibrations to the head, with a

higher incidence at low vibration frequencies and which, in the most severe cases, could generate resonance conditions, particularly when using platforms with sussultatory vibrations (up and down) instead of balancing ones (movement on horizontal level).

Among the other possible risks, to be studied one by one before using a vibrating platform, it is necessary to mention those related to retina problems, especially in subjects who underwent a surgical operation. In this case even relatively low frequencies can be dangerous. Instead there are no deep studies regarding the responsibility of vibrations in spreading tumoural cells. At present this hypothesis is only theoretically valid, with specific reference to tumours of the musculoskeletal system

CONCLUSIONS

In conclusion, we can consider the work of vibrating platforms useful for aims such as contrasting osteoporotic processes, improving explosive strength and maximum strength, better if together with classical methods, improving muscular tendinous stretching and everything deriving from it. It can also be used in rehabilitation processes and in treating proprioceptive disorders.

All this if the application protocols are applied, if equipments are used upon a real knowledge of the physiological mechanisms involved, and if professional equipments are used.

Instead there is no availability of scientific studies affirming or supporting a process of weight loss, of defects reduction, and/or of muscular hypertrophy in the times and ways described by advertising messages of companies selling vibrating platforms. Weight loss and hypertrophy represent the main factor for spreading and selling these products and cannot be defined otherwise than a **mere marketing operation**.

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CHOLESTEROL IN YOUNG ADULTS IN THE WEST

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ABSTRACT

Cholesterol is a waxy, fatlike substance found in the cells of all animals. There are two different lipoproteins that have important health concerns for adolescents. Low-density lipoprotein (LDL) can be thought of as a villain.

KEY WORDS: cholesterol, HDL cholesterol, LDL cholesterol, young adults, risk factors.

Often you might hear adults or young adults talking about cholesterol, saying that they went to the doctor for a blood test and the doctor told them that their cholesterol was high. However, if you ask them what cholesterol is, some of them may know and some of them may shrug their shoulders stating, "I am not sure what cholesterol even is."

Cholesterol is a waxy, fatlike substance found in the cells of all animals. It is not present in plants. In humans, cholesterol is produced in the liver and circulated throughout the body in the bloodstream.

The liver and body cells manufacture cholesterol, which is used in cell membranes, nerve cells, hormones and to make bile. When we consume cholesterol, the liver makes less, but there is usually excess, which is sent to the blood. This can collect in blood vessels and cause coronary disease. Studies show that saturated fats (animal fats, coconut and palm oil, eggs, dairy products, chocolate) raise blood cholesterol levels, whereas unsaturated fats (vegetable oils, fish oils) lower it. There are two different lipoproteins that have important health concerns for adolescents. Low-density lipoprotein (LDL) can be thought of as a villain. When cholesterol is transported in this manner, it can interact with the walls of one's arteries and become destructive. If LDL cholesterol collects on the wall of an artery, it can trigger white blood cells to collect at the site and this apparently produces a fatty substance that is called plaque. Over time, the artery can narrow and this will reduce blood flow. Calcium may also collect at the site and this could produce a blood clot. The reduced blood flow may produce signs of heart disease, and a blood clot in the coronary arteries that supply blood to the heart muscle may cause a heart attack."

Cholesterol Levels AHA Recommendation

Cholesterol plays a major role in a person's heart health. High blood **cholesterol** is a major risk factor for coronary heart disease and stroke. That's why it's important for all people to know their **cholesterol** level. They should also learn about their other risk factors for heart disease and stroke. Total blood **cholesterol** is the most common measurement of blood **cholesterol**. It's the number you receive as test results. **Cholesterol** is measured in milligrams per deciliter of blood (mg/dL). Blood **cholesterol** for adults is classified by levels. Your healthcare provider must interpret your **cholesterol** numbers based on other risk factors such as age, gender, family history, race, smoking, high blood pressure, physical inactivity, obesity and diabetes. **The American Heart Association endorses the National Cholesterol Education Program (NCEP) guidelines for detection of high cholesterol.** The Third Report of the Expert panel on Detection, Evaluation, and Treatment of High. Blood **Cholesterol** in Adults (Adult Treatment Panel III or ATP III) was released in 2001. It recommends that everyone age 20 and older have a fasting "lipoprotein profile" every five years. This test is done after a 9–12-hour fast without food, liquids or pills. It gives information about total **cholesterol**, low-density lipoprotein (LDL) or "bad" **cholesterol**, high-density lipoprotein (HDL) or "good" **cholesterol** and triglycerides (blood fats). Researchers have established healthy ranges for each of these. They're given in the lists below. If a fasting lipoprotein profile isn't possible, the values for total **cholesterol** and HDL **cholesterol** are acceptable.

Initial classification based on total cholesterol and HDL cholesterol

Total Cholesterol Level Category

Less than 200 mg/dL	Desirable level that puts you at lower risk for coronary heart disease. A cholesterol level of 200 mg/dL or higher raises your risk.
200 to 239 mg/dL	Borderline high
240 mg/dL and above	High blood cholesterol . A person with this level has more than twice the risk of coronary heart disease as someone whose cholesterol is below 200 mg/dL.

HDL Cholesterol Level Category

Less than 40 mg/dL (for men)	Low HDL cholesterol . A major risk factor for heart disease.
Less than 50 mg/dL	

(for women)

60 mg/dL and above

High HDL **cholesterol**. An HDL of 60 mg/dL and above is considered protective against heart disease.

If your total cholesterol is 200 mg/dL or more, or your HDL cholesterol is less than 40 mg/dL (for men) and less than 50 mg/dL (for women), you need to have a lipoprotein profile done to determine your LDL cholesterol and triglyceride levels. If your cholesterol is high or you have other risk factors, **your healthcare provider will likely want to monitor your**

cholesterol more closely. Follow your provider's advice about how often to have your cholesterol tested. He or she will set appropriate management goals based on your LDL cholesterol level and other risk factor.

LDL Cholesterol Level	Category
Less than 100 mg/dL	Optimal
100 to 129 mg/dL	Near or above optimal
130 to 159 mg/dL	Borderline high
160 to 189 mg/dL	High
190 mg/dL and above	Very high

Your LDL cholesterol goal depends on how many other risk factors you have.

- If you don't have coronary heart disease or diabetes and have one or no risk factors, your LDL goal is less than 160 mg/dL.
- If you don't have coronary heart disease or diabetes and have two or more risk factors, your LDL goal is less than 130 mg/dL.
- If you do have coronary heart disease or diabetes, your LDL goal is less than 100 mg/dL.

Triglyceride is the most common type of fat in the body. Many people who have heart disease or diabetes have high triglyceride levels. Normal triglyceride levels vary by age and sex. A high triglyceride level combined with low HDL **cholesterol** or high LDL **cholesterol** seems to speed up atherosclerosis (the buildup of fatty deposits in artery walls). Atherosclerosis increases the risk for heart attack and stroke.

Triglyceride Level	Category
Less than 150 mg/dL	Normal
150–199 mg/dL	Borderline high
200–499 mg/dL	High
500 mg/dL and above	Very high

How can we lower cholesterol?

❖ Consuming large amounts of oat bran?
Studies conducted in the '80s suggested that water soluble fiber, such as found in oat bran, has cholesterol-lowering effects. Some recent studies question this, and suggest eating large amounts of oat

bran may indirectly reduce cholesterol levels but taking the place of fats and high cholesterol foods in the diet.

- ❖ Avoid tobacco smoke
- ❖ Lifestyle habits: regular exercise and a good nutrition

Research with children aged 10-15 years indicates that lifestyle habits such as regular exercise, good cardio-vascular fitness, and a prudent nutritional profile are favorable lipid profiles similar to the effects of exercise observed with the adults.

❖ A regular intake of fish oil found in tuna, salmon, herring, sardines, and mackerel: One proposed protective mechanism from heart attack is that fish oil helps prevent blood clots from forming on arterial walls.

High cholesterol is not only related to coronary artery disease in adults but can be traced to coronary artery disease in teenagers as well. Coronary artery disease in adults begins in childhood and progresses through the teenage years. The hardening of arteries, or coronary artery disease, is a slow process of plaque building up on the inner walls of the arteries making them less elastic, constricted and thus less effective in the flow of blood. This process begins with birth, through childhood and into the teenage years. Coronary artery disease is caused by, among other things, cholesterol.

“Cholesterol and triglycerides are lipids or fat like substances that are found in the human body. Cholesterol is an essential nutrient for adolescents as it is needed to manufacture certain hormones including testosterone and estrogen, it is essential to the synthesis of vitamin D which is necessary for healthy bones and it is also utilized to repair the membranes around our cells. Triglycerides are molecules of fat that are enclosed along with cholesterol during transport in the bloodstream. When cholesterol and triglycerides and some other fats are transported together in the blood, they are packed together in bodies that are termed lipoproteins.

Western diets are high in cholesterol and ultimately cause coronary artery disease. On television, it is common to see advertisements for fast food targeted at teenagers and children. Promotions such as McDonalds’ “Happy Meal” or Chucky Cheese Birthday parties are directly aimed at children in the western hemisphere especially, The United States.

Taco Bell, McDonalds, Burger King, Kentucky Fried Chicken, Arby’s, Nathan’s, Pizza Hut, Dominoes and similar fast food chains are all high in saturated fat. Fast food restaurants make up a large portion of the western diet, especially in teenagers. Saturated fat is the main dietary cause of high blood cholesterol. Saturated fat is found mostly in foods from animals and some plants.

Foods from animals include beef, beef fat, veal, lamb, pork, lard, poultry fat, butter, cream, milk, cheeses and other dairy products made from whole and 2 percent milk. All of these foods also contain dietary cholesterol. Foods from plants that contain saturated fat include coconut, coconut oil, palm oil and palm kernel oil (often called tropical oils), and cocoa butter.

With such a high intake of saturated fat from fast food, western teenagers, were and still are candidates for coronary heart disease. Thus, it is no surprise that the United States obesity rates are the highest in the world.

“Obesity in the United States has been increasingly cited as a major health issue in recent decades.^[3] While many industrialized countries have experienced similar increases, American obesity rates are the highest in the world with 64% of adults being overweight or obese, and almost a quarter being obese.”^[4] Estimates of the number of obese American adults have been rising steadily, from 19.4% in 1997, 24.5% in 2004 to 26.6% in 2007.”^[5]

With coronary heart disease and high cholesterol on the rise with adults in the west, prevention must begin with adolescence. Presently, fast food restaurants are shaping their menus to accommodate educated parents and teenagers who want to live a healthy life. Even Taco Bell has a “fresco” menu consisting of items low in fat. School cafeterias are serving healthier lunches and banning high sugar drinks such as Coca Cola and Pepsi.

Because of pressure from parents and anti-obesity advocates, many school districts have removed sodas, junk foods, and candy from snack and vending machines and cafeterias.^[6] State legislators in California, for example, passed laws banning the sale of machine-dispensed snacks and drinks in elementary schools in 2003, despite objections by the California-Nevada Soft Drink Association.^[7] The state followed more recently with legislation to prohibit their soda sales in high schools by 2009, with the shortfall in school revenue to be compensated by an increase in funding for school lunch programs.^[8] In mid-2006, the American Beverage Association (including Cadbury, Coca Cola and Pepsi Co) agreed to a voluntary ban on the sale of all high-calorie drinks and all beverages in containers larger than 8, 10 and 12 ounces in elementary, middle and high schools, respectively”^[9]

Measures such as these are attempting to the lower the alarmingly high cholesterol level of teenagers and adults in the United States. Genetics is also a factor in teenage high cholesterol levels.

Another preventive measure of high cholesterol and coronary heart disease is exercise. Children today do not exercise like they once did in the era before computers, play stations and video games. Adolescents and teenagers, growing up prior to the computer revolution, would be playing outside from sunrise until sunset. As the weather changed, so did the sport. Soccer was played in the fall, ice skating in winter, basketball in the spring and swimming or tennis during the summer. There were organized leagues for these activities and almost every child participated.

Today, children cannot find coaches for their little league team. It’s not unusual to find a player’s mother as the manager of a boys baseball team or head coach of a boys soccer team. With so few children

playing organized sports, they would rather be playing video games, leagues are discontinuing and less fathers are interested in coaching.

Therefore, parents need to refrain from letting their children watch endless hours of Television or play video games for hours at a time. Schools and communities must implement mandatory after school programs and/or recreation leagues for children and teenagers who are obese, have high cholesterol or coronary heart disease.

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LOGISTIC MANAGEMENT OF PROFESSIONAL SPORTS STRUCTURES IN THE DISTRICT OF CONSTANTA

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ABSTRACT

POPA CRISTIAN. Logistic management of Professional sports structures in the district of Constanta

OBJECTIVE: The preliminary study of the current status of the clubs activities from the point of view of the logistic support and the records established by the sports clubs in the district of Constanta: the analysis of the structural and process-related organizations; jobs descriptions and attributes; SWOT analysis of the logistics; establishing structural elements of the strategic institutional development plan. Drafting and implementing strategic development projects for the logistic development of the sports clubs in question.

RESEARCH METHODS AND PROCEDURES: For the preliminary study we turned to analyzing the activities in all the professional sports clubs and associations in the district of Constanta. The managers in leading positions with functional and operational attributes within sports clubs played a major role in our study. Our investigation included all club directors, councilors, heads of the departments and last but not least coaches who are directly involved at all levels of formation and training professional athletes.

RESULTS: The results were inscribed in the logistics grid assessment and rated from 0 to 3. Each individual leader filled the grid in both in the preliminary and the final stage of the research on the logistic management.

DISCUSSION AND CONCLUSIONS: Our operational surveys confirmed the first assumption, namely that a structural and process-related reorganization of the sports clubs facilitate the promotion of top-performance logistic components. We are keen on believing that *if the sports clubs' activities are managed from the logistical point of view, resources would then be better employed, and the athletes' performance would significantly improve.*

KEY WORDS: logistic management, professional sports structures, strategic development projects.

INTRODUCTION

❖ Motivation of choice

Being directly involved in the professional sports business and being intimately acquainted with the strengths and especially the weaknesses of these structures, we would like to stress out since the very

beginning several important features that caused us to choose this theme, namely:

- the maintenance of the old schemes of structural and process organization of these clubs (conceived after 1990);
- the lack of strategic development projects of the sports structures in the work herein, which allow focus

on clearly defined objectives from the managerial point of view;

- the failure to make good use of financing opportunities;
- conflicting tasks and responsibilities assumed in inappropriate positions;
- lack of concern for continuous improvement of human performance and activities within the clubs, namely:

❖ The importance and novelty of the research

1. Logistics is specific to the military, however in developed countries, such as USA, Germany, France, or Italy, superior councils have been specifically set up for the study of the logistic phenomenon which endorses any type of professional sport.
2. The total absence of information on the logistic management in our field of activity.
3. The precarious infrastructure and logistics of public professional sports clubs compared to the private professional sporting clubs, in the context of integrating sports facilities within EU standards and norms.
4. Research program on finding and efficiently spending elements specific to logistic management.

Purpose of research

From a bird's eye's view, our research is focusing on the following purposes:

- Extrapolation of the logistic management concept into our field of activity with the help of strategic projects for institutional development.
- Identification of the constitutive elements of logistic management and identification of the opportunities to extrapolate this very concept into defining the activities of professional sporting clubs in the district of Constanța.
- The selection of an elaborated procedure and the implementation of an assessment instrument for the Constanța sports clubs.

The purpose of the research

1. Studying the special literature on the experimental side.
2. Identifying the current level of theme knowledge and research and registering it in a bibliographical synthesis also used in the research reports.
3. Ensuring approval and preparation of the scientific research project focused on the choice of sports clubs that will be subject to the study and preparation of the diagnosis instruments.
4. The preliminary study of the current status of the clubs activities from the point of view of the logistic support and the records established by the sports clubs in the district of Constanța:
 - the analysis of the structural and process-related organizations;

➤ Permanent assessment and training of technicians and trainers within sports clubs.

➤ Promotion of scientific research for improving the athletes' selection, formation and activities related to attendance of competitions.

➤ The piling up of attributions and tasks onto certain positions etc.

- jobs descriptions and attributes;

- SWOT analysis of the logistics;

- establishing structural elements of the strategic institutional development plan.

5. Drafting and implementing strategic development projects for the logistic development of the sports clubs in question.

6. Choosing the executive and functional staff drafting and implementing the projects.

7. Monitoring and counseling the implementation of the projects.

8. Analyzing the results, assessing their efficiency, discussing, talking them over and negotiating them with the executive staff of the sports clubs.

9. Drafting syntheses based on the results obtained at different stages of the research, writing thesis for scientific exchange.

10. Drafting the work and debating the results and strategies with the individual departments in F.E.F.S. – Pitești.

11. Public defense of the thesis.

To further scale the activities in our work, we would hereby like to mention that:

❖ The documentation and constant assessment of the theme took place throughout the entire research (2006-2008);

❖ Ensuring media coverage and preparation of instruments took place in 2007 (January-June);

❖ The preliminary study took place in 2007 (July-December) and 2008 (January-February);

❖ The drafting the projects took place in 2008 (January-March);

❖ Putting to practice (monitoring) took place in 2008 (May-August);

❖ The assessment of the project took place in 2008 (September).

Research background

1. *We consider that in the new social-economic conditions and background in our country, the process and structural organization of the sports clubs need to be changed so as to facilitate the promotion of the logistic components specific to professional sports.*

2. *We consider that if the activity of sports clubs will be subject to the system of logistics – planning and action – then resources will better*

shared, and the professional sports activities will benefit from better endorsement.

Location of the preliminary study and of the experimental side

The investigated sports clubs

For the preliminary study we turned to analyzing the activities in all the professional sports clubs and associations in the district of Constanta. The managers in leading positions with functional and operational attributes within sports clubs played a major role in our study.

Our investigation included all club directors, councilors, heads of the departments and last but not least coaches who are directly involved at all levels of formation and training professional athletes.

Below please find the most important sports clubs and structures and the personalities that were subject to our investigation.

The investigated and consulted sports clubs and functional / operational managers are:

- C.S. „Știința” – Director – Univ. PhD Professor STĂNCULESCU George
- Clubul Sportiv “Farul” – Director General - Professor FLOROIU Ilie
- Clubul Sportiv Școlar Nr.1 – Director - Professor COSTARA Cristina
- C.S.Ș. Nr. 2 – Liceul cu Program Sportiv – Director – Professor SZEMERJAI Andrei
- C.S.Ș. Medgidia – Director Professor PETRICALĂ. Valentin

The pursuit of the research

As can be noted from the “*Scheduling the studies and the scientific investigations*”, after the approval and the preparation of the project, which consisted of selecting the sports clubs that will be part of the investigation and preparing the assessment tools, we moved to the third stage – investigating the ratio between the logistics and the records of the target sports clubs.

The preliminary study on the sports clubs consisted first and foremost of establishing contacts with the heads of the clubs (presidents, directors) and setting up the themes for discussion:

- the name and history of the club;
- the number of functional sports departments;
- the organizational structure;
- the affiliated professional sports sections;
- the special performances in the past two years (2006 / 2007).

The preliminary study continued with the following objectives:

- discovering the organizational and process-related structure of the clubs;

- establishing the functions, the attributions and the tasks within the clubs;
- the SWOT analysis of the clubs’ logistics;
- the organization of the selection and training process;
- synthesis of the preliminary study;
- establishing structural elements within the clubs’ strategic development planning.

Following the theoretical and methodological investigations in the first part of the work, according to the data in the SWOT and PEST(E) analyses, the next stage consists primarily of “*strategizing development plan for the sports clubs*”, and secondly the project was discussed with the executive and functional staff of every individual club.

The next step consisted of the drafting of the projects (based on the scheme elaborated by us) for every individual project. We have to point out that several meetings were required for the drafting of the projects, in order to overcome and solve the gaps in the documentation. An average of at least three consecutive drafts was issued by every project holder in order for them to establish the correct parameters and data.

One of the most difficult problems we came across was the logistic management – both as a concept seldom used by our specialists, as well as an organizational system of the entire activity. To make the concept more popular, and at the same time to ensure its proper comprehension, we came up with an assessment grid of fundamental logistic elements, with a rating system from 0 to 3. The grid is available in its form before being filled in by every club manager – both in the preliminary and final stage of the research (see ATTACHMENT A1)

The final stage of the research consisted of the technical assistance provided for the implementation of the projects (including monitoring).

The implementation proper was no easy task. We first of all encountered difficulties in terms of rethinking and restructuring the clubs’ structure in accordance with the logistic concept. If in some sectors the selection was sharply targeted on the financial situation, the premises and equipment, and the maintenance activities, other logistic components were met with numerous confusions and ambiguities in the case of certain functions, roles and tasks specific to logistic elements being outsourced or transferred to third parties.

Naturally and eventually the leader’s decision counted and the activities were rethought and reorganized.

To better identify the stages of our work we would like to mention that:

❖ **The theme of the work was documented and identified throughout the entire research (2006-2008);**

❖ **The instruments were approved to and prepared in 2007 (January-June);**

❖The preliminary study took place in 2007 (July-December) and 2008 (January-February);

❖The projects were drafted in 2008 (January-March);

❖The implementation (and monitoring) took place in 2008 (May-August);

❖The project assessment took place in 2008 (September).

ESTABLISHING THE ESSENTIAL STRUCTURAL ELEMENTS OF A STRATEGIC DEVELOPMENT PLAN FOR THE SPORTS CLUBS

After having gone through the literature, we have decided the *strategic development plans for the sports clubs* should have the following structure:

1. Club's (institution's) identification details:

➤ name, address, fax number, web page, management team.

2. Organizational culture:

➤ Club's history, its role in the community, traditions.

3. Detailed information:

➤ population (school, sports);

• number of athletes per segments (high schools);

• number of athletes with good and very good results;

• number of athletes with health, social, etc issues.

➤ Didactic personnel: coaches, athletes, instructors (full-fledged / substitute, working hours, teaching degrees, categories of coaches);

➤ Material resources: training facilities (halls, gyms, classrooms, labs, workshops, libraries, cabinet etc., sports grounds)

- non-didactic and sanitary spaces;

- training materials, devices, apparatuses, etc.;

- revenues, financing;

- own revenues provided by additional services.

4. Quality information:

➤ The athletes' background: family, neighborhood, education level;

➤ The education of the training staff and the auxiliary personnel;

➤ Graduation ratio;

➤ Sports debut ratio.

5. Presentation of the institution's mission and vision.

6. Presentation of the targets / purposes, the strategic choices and their role in the project's general objectives (implemented within the operational plans).

7. Drafting the operational plans

The first segment will be carried out depending on the success of the project stages.

The operational plan – maximum a year on functional segments, represents the solutions for the strategic objectives.

An (annual) operational plan will have the following structure:

- operational objectives and the activities necessary to carry them out;
- educational / training objectives;
- deadlines;
- work stages;
- responsibilities for each individual member;
- targeted performance indicators.

8. ATTACHMENTS

- results of various analyses – SWOT, PEST (E) on various segments:

- the institution's curriculum;

- HR, financial and material resources;

- relationship with the community.

- Assessment reports;

- Analysis reports;

- Statistics regarding the population involved in the activity, material and human resources etc.

Drafting the development plans of the logistic management within the sports clubs

The previous preliminary study – besides the approach of the internal and external environment – of the sports clubs in question aimed at establishing the components that compose the development structure of logistic management. As observed, this operation has already been debated herein, therefore we will approach it no more. We would however like to stress out the fact that this structural sketch of the strategic development projects has been discussed with the executive staff of each and every sports club. The final projects were based on the drafts we presented.

The drafting of the projects was the task of club presidents and managers who instituted a project team, as follows:

➤ **For C. S. Știința:** Director University PhD Professor Stănculescu George, University PhD Professor Gevat Cecilia, University PhD Professor Damian Mirela, PhD Lecturer Larion Alin, PhD Student Popa Cristian.

➤ **For C.S. Farul** – Director Ilie Floroiu, Sorin Bașturea – Assistant director, Dumitru Mihăilescu – expert.

➤ **For C.S.Ș. Nr. 1** – Director Prof. Cristina Costara, Assistant Director Mihail Făgărășan; Nicoleta Tastaman – administrator.

➤ **For C.S.Ș. Nr. 2 L.P.S. Constanța-** Director Andrei Szemerjai, Assistant Director Popa Mircea, Prof. Cornelia Sticlaru;

➤ **For C.S.Ș. Medgidia:** Director Petrică Valentin Octavian, Neacșu Mihai – head of the sports department.

All these commissions were carefully monitored by us.

Results and their interpretations

The results were inscribed in the logistics grid assessment and rated from 0 to 3. Each individual leader filled the grid in both in the preliminary and the final stage of the research on the logistic management.

The statistical analysis of the data pursued the answers to the following questions:

1. *Has the quality of the logistic management system improved in the professional sports clubs in the interval between the initial and the final assessment?*
2. *Are there any significant differences between the quality systems of the logistic management implemented in sports clubs at a global level for all the 8 logistic components?*
3. *What is the share of every logistic component within every quality system of the logistic management implemented in the 5 sports clubs?*
4. *What is the share of the quality system of the logistic management of every sports club?*

CONCLUSIONS

The scientific investigations in this work were aimed at promoting the logistic management within professional sports clubs against the stormy social – economic background specific to the transition period our country is going through. Naturally, such investigations focused on several independent variables which were partially confirmed because numerous sectors of activity (including professional sports) are determined or correlated to the social-economic factor. Hence the following final conclusions:

The PEST and SWOT analyses revealed the fact that process-related and structural organization of the clubs do not respond to the current social-economic situation. In this respect, we believe such organization should be changed and improved.

Our operational surveys confirmed the first assumption, namely that a structural and process-

related reorganization of the sports clubs facilitate the promotion of top-performance logistic components.

In this respect, we would like to highlight the following aspects that require restructuring and reorganization:

1.1. The elaboration of new organizational charts of the clubs.

1.2. The elaboration of the job descriptions which clearly define the functions, attributions and tasks split per individual sectors of activity.

1.3. The augmented reorganization of the functional sectors split per logistic components:

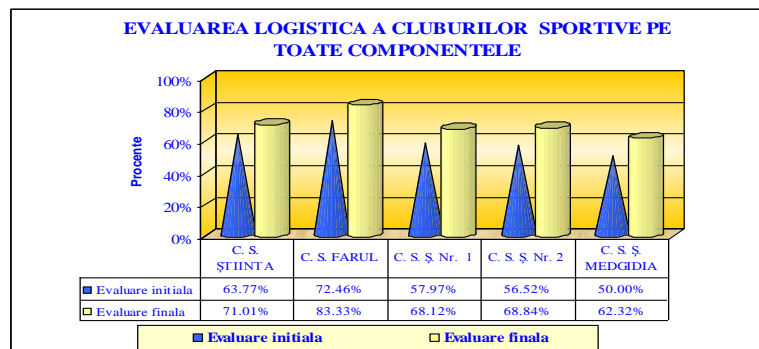
- ❖ *Selection, training, formation and attendance to competitions;*
- ❖ *Financial insurance;*
- ❖ *Material base;*
- ❖ *Maintenance;*
- ❖ *Transport;*
- ❖ *Medical insurance;*
- ❖ *Feeding and providing competition and training equipment;*
- ❖ *Scientific assistance.*

2. We are keen on believing that *if the sports clubs' activities are managed from the logistical point of view, resources would then be better employed, and the athletes' performance would significantly improve.*

2.1. Every sports club involved into our research improved its existing logistic management (C. S. Știința Constanța; Clubului Sportiv Farul Constanța; Clubului Sportiv Școlar Nr. 1; Clubului Sportiv Școlar Nr. 2; Clubului Sportiv Școlar Medgidia).

		C. S. Știința	C.S. Farul	C.S.Ș. Nr. 1	C.S.Ș. Nr. 2	C.S.Ș. Medgidia
T. I.	X	11.00	12.50	10.00	9.75	8.63
T.F.	X	12.25	14.38	11.75	11.88	10.75

2.2. The synopsis below shows that from the logistical point of view the chart looks as follows:



The Logistic assessment of the sports clubs split per components

➤ **The Farul Sports Club** was assessed at 83.33% at the final evaluation, compared to the initial of 72.46%.

➤ **The Știința Sports Club** was assessed at 71.01% compared to the initial of 63.77%.

➤ **The No 2 School Sports Club Nr. 2** was assessed at 68.84% at the final evaluation, compared to the initial of 56.52%.

➤ **The No 1 School Sports Club 1** was assessed at 68.12% at the final evaluation, compared to the initial of 57.97%.

➤ **The Medgidia Sports Club** was assessed at 62.2% at the final evaluation, compared to the initial at 50.00%.

*In conclusion, based on the opinion of functional managers who participated in the implementation of the logistic projects, the entire activity is now being rethought and restructured for the purpose of increasing the efficiency in all sectors; at the same time, according to experienced decision makers such as **PhD Professor STÂNCULESCU George, Professor FLOROIU Ilie, Professor COSTARA Cristina, Professor SZEMERJAI Andrei, Professor PETRICALĂ Valentin**, the entire activity is subject to the efficient spending of all resources and better management of existing infrastructure. The above-mentioned clubs are self-regulating organisms since they provide their own resources, they are the sole managers of their activity, are part of the national sports system, and are run based on the three joint systems: executive, representative and operational.*

SUGESTIONS ON THE IMPROVEMENT OF THE SPORTS CLUBS' LOGISTIC MANAGEMENT

1. The creation of autonomous, self-financed, self-sustained, self-managed, self-organized units, according to the logistic concept.

2. Setting up powerful sports clubs and associations split per type of sports: C.S. Basketball; C.S. Athletics etc.

3. Including technical teams in the organizational structure of the sports clubs who should target and pursue clearly defined development strategies.

4. Promoting a system of target-based approach in terms of logistic structural and process-based development.

5. A well organized sports structure requires a hierarchical decisional structure and the capacity to organize operational teams which should work permanently or temporarily (in crisis situation).

6. Establishing partnerships with unions and other interest groups.

7. Studying and benefiting from EU market.

8. Growing the manager's strategic role to deliver on the needs of the departments and in prioritizing profitable sectors, and mainly the selection, formation, training and participation in sports competitions.

9. Making decisions based on four main criteria: economic, functional (operative), political and social.

10. Perfecting the organizational relationships with institutions and interest groups.

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HEART RATE RESPONSE AND GAME-RELATED ACTIVITY OF YOUNGER SCHOOL-AGE BOYS IN DIFFERENT FORMATS OF SOCCER GAME

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ABSTRACT

Small-sided games are used in soccer training to improve technical and tactical skills, and to stimulate physical fitness of players. Loading of the cardiovascular system of adult and adolescent soccer players during the small-sided games were found similar to the cardiovascular system response in a running exercise. There is generally acknowledged that small-sided soccer games represent an appropriate learning environment for acquiring game skills in youth

OBJECTIVE: The aim of the study was to investigate the heart rate response and game-related activity during three different formats of soccer game in younger school-aged children – soccer players.

RESEARCH METHODS AND PROCEDURES: Twenty 8-year-old boys (8.1 ± 0.4 year, $n=20$) of the same team from one Czech elite soccer club volunteered to participate in the study that was ethically approved by Ethical Committee of Faculty of Physical Education and Sports of Charles University in Prague. All boys had undertaken 1.2 ± 0.3 years of systematic soccer training. The boys participated in six experimental matches, two matches in each from three formats of soccer: five, eight- and eleven-a-sided games including a goalkeeper in field dimension 40×20 m (dimensions of the goal 5×2 m), 60×48 m (the goal 5×2 m) and 96×60 m (standard dimensions of the goals), respectively. The time duration of each match was 30 minutes. All matches were performed during three weeks.

RESULTS: The different formats of the soccer game showed a similar frequency of the various types of the attack phases diversified from a number of executed passes in one attack phase. The percentage of the attack phases without a pass 23.4 % in the 5 vs 5 game was two-fold in comparison to 8 vs 8 game. This finding suggests more difficult game-situation conditions for cooperation among the boys in the 5 vs 5 game. The percentage of the attack phases with one pass was higher especially in the 11 vs 11 game in comparison to the 5 vs. 5 game (63.1 % vs 43.2 %).

DISCUSSION AND CONCLUSIONS: The study suggested that the soccer game formats from five-a-side game to eleven-a-side game provide very young boys the similar conditions for learning game-related cooperation based on passes. To improve aerobic fitness, the eight-a-side game format seems to be more suitable for very young children rather than the five-a-side and eleven-a-side game.

KEY WORDS: soccer, younger school-age boys, different formats of soccer game, heart rate response.

INTRODUCTION

Small-sided games are used in soccer training to improve technical and tactical skills, and to stimulate physical fitness of players. Although coaches often involve the small-sided games in training sessions, there is a little knowledge about effects of these training forms on development of the game performance and physical fitness of players.

Results of the studies with adolescent players showed that two-, four-, six-a-sided games can provide sufficiently the intensive and consistent stimuli for improvement of aerobic capacity (Hill-Haas et al., 2008 a,b, Impelizzeri et al., 2006, Nurmekivi et al., 2002). Loading of the cardiovascular system of adult and adolescent soccer players during the small-sided games were found similar to the cardiovascular system response in a running exercise (Dellal et al., 2008, Impelizzeri et al., 2006). The trend of increasing of exercise intensity with decreasing of format of the soccer game was suggested in adult amateur soccer players (Rampinini et al., 2007).

There is generally acknowledged that small-sided soccer games represent an appropriate learning environment for acquiring game skills in youth (Griffin & Patton, 2005, Thorpe et al., 1986). Using the

standard game format, i.e. eleven-a-sided game in children was already criticised for its unsuitable demands which do not correspond to physical and psychomotor dispositions of children (Thorpe et al., 1986). Nevertheless, there is no information about effects of small-sided soccer games on acquirement of game skills and improvement of aerobic fitness in children. The only study with child soccer players showed that seven-a-sided game could be more effective for learning game skills when this game format enabled to execute a higher number of passes and fewer tackles (Capranica et al., 2001).

Information on physiological responses and the game-related activity profile of players during a soccer match played in the different formats may lead to better understanding of their potential effect on development of the game skills and physical fitness in children. Therefore the aim of the study was to investigate the heart rate response and game-related activity during three different formats of soccer game in younger school-aged children – soccer players.

MATERIALS AND METHODS

Participants

Twenty 8-year-old boys (8.1 ± 0.4 year, $n=20$) of the same team from one Czech elite soccer club volunteered to participate in the study that was ethically approved by Ethical Committee of Faculty of Physical Education and Sports of Charles University in Prague. Informed consent was obtained from the parents of the boys after verbal and written explanation of the experimental design. All boys had undertaken 1.2 ± 0.3 years of systematic soccer training with frequency three training sessions a week plus one match a week on average during their spring and autumn competitive season.

Procedures

Experimental matches

The boys participated in six experimental matches, two matches in each from three formats of soccer: five, eight- and eleven-a-sided games including a goalkeeper in field dimension 40x20 m (dimensions of the goal 5x2m), 60x48 m (the goal 5x2 m) and 96x60 m (standard dimensions of the goals), respectively. The time duration of each match was 30 minutes. All matches were performed during three weeks. To analyse game-related activities and physiological loading during six experimental matches, six boys were randomly selected from the group of boys according to their usual player's position in mini-soccer matches (8 vs. 8) as the official game of Czech Football Association for U10 teams, i.e. two defenders, midfielders and forwards were selected. The selected boys played the same player's position in all matches. To avoid the effect of fatigue on the game-related activities in the five-a-side game, regular switching of the 5-min work interval and 5-min rest interval was used.

Analysis of game-related activity

To analyse game-related activity, the matches were recorded using two portable video-cameras Panasonic NV-MS2B placed on the opposite sides at the level of central line of the field in vertical height 8 m and in the distance 40 m from lengthwise central axis of the field. The game-related activities (table 1)

were exactly defined and assessed on the inter-observer reliability by two independent high-educated coaches. The inter-observer reliability of identification of the game related-activities ranged from 95.7 % to 100 %.

Assessment of physiological loading

To assess physiological loading, the heart rate (HR) of the boys was recorded in 5-s intervals during the matches by POLAR S810i equipment (Polar, Oy, Finland). The physiological loading of the boys was evaluated by total time duration of the HR in the particular exercise intensity zones determined according to Bunc (1990):

Aerobic zone – $HR < HR_{AT}$ (HR_{AT} = heart rate at the aerobic threshold)

Aerobic – anaerobic zone – $HR_{AT} \leq HR \leq HR_{VT}$ (HR_{VT} = heart rate at the ventilatory „anaerobic“ threshold)

Anaerobic – aerobic zone – $HR > HR_{VT}$.

To identify the above mentioned exercise intensity zones, the HR_{VT} was determined from the laboratory incremental test on the running treadmill used for each subject. Before the test, each boy warmed up on a treadmill with 0 % incline for 4 min at speed 6.0 and 8.0 $\text{km} \cdot \text{h}^{-1}$. The initial testing speed of 7.0 $\text{km} \cdot \text{h}^{-1}$ was increased every minute by 1.0 $\text{km} \cdot \text{h}^{-1}$ till voluntary exhaustion. The cardiorespiratory variables were assessed using an open system with help of TEEM 100 (AeroSport, Ann Arbor, Mich.) equipment (Novitsky et al., 1995). The cardiorespiratory variables were calculated automatically every 20 seconds. The ventilatory threshold (VT) was assessed by means of two-compartment linear model from the relation of pulmonary ventilation to oxygen uptake or CO_2 output. This was done by computer algorithm in order to establish a two-line regression intersection point (Bunc et al., 1987). The data at VT level were determined by linear interpolation. The HR_{AT} was calculated as the HR_{VT} minus 12 % (Bunc, 1990).

RESULTS AND DISCUSSION

Results of analysis of game-related activity of the boys in the separate formats of the soccer game are shown at the table 1.

Table 1. Frequency of the game-related activities (I, III-V,VIII), time characteristics of the game (II and IX) and efficiency of the attack phases in the different formats of the soccer game

Game-related variable	Frequency or time per one match (per one a player – in the parenthesis)			[%]		
	11 vs 11	8 vs 8	5 vs 5	11 vs 11	8 vs 8	5 vs 5
The format of soccer game						
I. Number of the attack phase [n]:	84	101	111			
without pass	1	12	26	1.2	11.4	23.4
with one pass	53	53	48	63.1	52.5	43.2
with two passes	16	23	22	19	22.8	19.8
with free passes	8	9	10			
with four passes	4	3	4	16.7	11.9	12.6
with five passes	2	1	1			
II. Mean time duration of the attack phase [s]	9.2 ± 3.1	7.5 ± 2.9	6.5 ± 3.6			
III. Number of passes [n]	135 (6.8)	143 (10.2)	143 (17.9)			
IV. Number of shots[n]	15 (0.7)	21 (1.5)	49 (6.1)			
V. Number of ball possession [n]	183 (8.3)	208 (14.8)	220 (27.5)			
VI. Efficiency of individual offensive play (variables III plus IV/variable V) [%]	82.0	78.8	87.3			
VII. Efficiency of individual offensive play (variable III/variable V minus IV) [%]	80.4	76.5	83.6			
VIII. Number of tackles [n]	51 (4.6)	43 (6.1)	64 (16)			
IX. Net time of the match [s]	1297	1191	1307			

The finding of a higher number of executed attack phases (variable I, table 1) with decrement of the format of soccer game suggests an advantage of small-sided games from point of view of repeated game situations that require decision-making and offensive game skills execution. The longer mean time duration of the attack phases in the eleven-a-side-game (11 vs 11 game) could be explained by executing of offensive activities in open space, especially at the beginning of attack phase started from own defensive zone. However, the differences of the time duration of the

attack phases less than three seconds in separated formats of the soccer game cannot be considered as significant.

The different formats of the soccer game showed a similar frequency of the various types of the attack phases diversified from a number of executed passes in one attack phase (variable I, table 1). A number of attack phases without a pass has significantly increased with decreasing of the game format as absolutely as relatively to the total number of attack phases. The percentage of the attack phases

without a pass 23.4 % in the 5 vs 5 game was two-fold in comparison to 8 vs 8 game. This finding suggests more difficult game-situation conditions for cooperation among the boys in the 5 vs 5 game.

The frequency of executed passes including shots related to the frequency of individual ball possession (variable VI, table 1) provides the picture about the efficiency of a player's offensive play. It was showed that this type of efficiency was only 5 % and 8 % higher in 5 vs. 5 game in comparison to the 8 vs 8 and 11 vs 11 game, respectively. Similarly, if we excluded the ball possession finished by a shot in calculation of the efficiency of the individual offensive play (variable VII, table 1), this type of the efficiency in the 5 vs. 5 game was again for about 3 % and 7 % higher than in other two formats. These findings showed that difficulty of the game-situation conditions for executing an attack phase was comparable in all game formats.

The percentage of the attack phases with one pass was higher especially in the 11 vs 11 game in comparison to the 5 vs. 5 game (63.1 % vs 43.2 %). Then the percentage of the attack phases without pass or with one pass, i.e. playing with limited cooperation, was very similar in all game formats – 64.3 %, 64.4 % and 66.6 % in the 11 vs. 11, 8 vs 8 and 5 vs 5 game, respectively. The percentage of the attack phases with developed cooperation, i.e. the attack phases including

two, three and more passes was again very similar in all game formats.

The frequency of the game-related activities, i.e. passes, ball possession, shoots and tackles (table 1) performed during a match per one player was increasing with decreasing of the game format. In the 5 vs 5 game a player executed 1.8 times and 3 times more passes, 2 times and 3.5 times more ball possession, 4 times and 9 times shots, 3 times and 4 times more tackles in comparison to the frequency of these game-related activities performed in 8 vs 8 game and 11 vs 11 game, respectively. These findings show that small-sided soccer games are more suitable for learning game skills in very young boys.

The average value of maximal oxygen uptake $VO_2 \text{ max} = 57.8 \pm 3.6 \text{ ml.kg}^{-1}.\text{min}^{-1}$ found in the boys – soccer players showed their very good aerobic performance. These values of $VO_2 \text{ max}$ were 10 % higher in comparison to values of $VO_2 \text{ max}$ published for non-trained boys (Wilmore & Costill, 1994) and similar to boys of the same age trained in track running (Rowland, 1996).

As the heart rate indicated, there was balanced physical loading over all intensity zones in the 11 vs 11 game in comparison to the game formats with a lower number of players (table 2). In the 11 vs 11 game the higher percentage of total time duration of heart rate under the aerobic threshold level was found in comparison to the 8 vs 8 game and 5 vs 5 game.

Table 2. Total time duration of physical loading in the particular intensity zones indicated by heart rate in different formats of soccer game (percentage from a 30-min match)

First match				Second match			
game format	Exercise intensity zones			game format	Exercise intensity zones		
	HR < HR _{AT}	HR _{AT} ≤ HR ≤ HR _{VT}	HR _{VT} < HR		HR < HR _{AT}	HR _{AT} ≤ HR ≤ HR _{VT}	HR _{VT} < HR
5 vs 5	11 ± 6	47 ± 18	42 ± 21	5 vs 5	14 ± 8	45 ± 19	41 ± 27
8 vs 8	20 ± 13	54 ± 16	26 ± 15	8 vs 8	19 ± 13	61 ± 16	20 ± 10
11 vs 11	31 ± 16	47 ± 9	22 ± 15	11 vs 11	25 ± 23	37 ± 7	38 ± 18

HR_{AT} - heart rate at the aerobic threshold level

HR_{VT} - heart rate at the ventilatory („anaerobic“) threshold level

In the 8 vs 8 game, the total time duration of the heart rate between the aerobic and ventilatory threshold was longer than in the 5 vs 5 game and 11 vs 11 game. In the 5 vs 5 game, the total time duration of the heart rate above the ventilatory threshold was markedly longer than in the other game formats with a higher number of players in a team.

The higher portion of heart rate in the exercise intensity zone between aerobic and ventilatory threshold, and in the zone above ventilatory threshold in the 5 vs 5 game – $87.7 \pm 5.6 \%$ and $83.8 \pm 8.3 \%$ in the first and second match, respectively, suggests that

the higher rate of aerobic metabolism was required for the dominant part of a match played in this small-sided soccer game. Increasing the rate of aerobic metabolism above the ventilatory threshold is connected with increasing contribution of anaerobic metabolism to total energy production. The higher intensity of physical loading found in the 5 vs 5 game is probably consequence of higher participation of players on the team game performance in this small-sided game as the analysis of game-related activities showed.

Analysis of locomotion activity of players would bring more objective information on physical loading of player in the match. Also the fact that

children 5 vs 5 game entered into a match repeatedly after 5-min rest intervals could affect a higher effort of the boys.

Although the physical activity of players during a match can be affected by the external factors as physical activity and game performance of an opponent team, physical conditions of environment (weather, surface of a field) and the endogenous factors as psychological and physical status of children, the similar average values of heart rate in the both matches were found for each game format (table 2).

CONCLUSIONS

The study suggested that the soccer game formats from five-a-side game to eleven-a-side game provide very young boys the similar conditions for learning game-related cooperation based on passes. However, a number of players in a team proved as the important factor affecting the frequency of executing the offensive game-related activities per one player. Thus, in comparison to the game formats with higher number of players, the five-a-side game format provides the best learning environment for acquiring of the game skills although the physical loading of very young children seems to be too high in this small-sided game. To improve aerobic fitness, the eight-a-side game format seems to be more suitable for very young children rather than the five-a-side and eleven-a-side game.

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VIDEO ANALYSES OF THE TECHNIQUES USED IN THE 10th WOMEN WORLD TAEKWON DO CHAMPIONSHIP IN 2005

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ABSTRACT

Taekwon do consists of sudden and symmetric action items in Karate, and more fluent and circular action items in Kung Fu. Taekwon do or olympic Taekwon do competition is a complete touch sports in which winner is defined by high score or knock-out. Points are gained by means of kicks and fists when they are done in the area that is regarded as legal. In a Taekwon do competition, in general, most points are gained by means of kick techniques more (approximately 80%, 90%) rather than boxing techniques.

OBJECTIVE: The target of this study is to research the technical analysis of competition and the techniques which are effective on success in 10th Women World Taekwon-do Championship, 2005.

METHOD: Surrounding of the research consists of 32 sportswomen winning elimination competitions in Championship. Semi final and final competitions recorded by World Taekwon-do Federation have been watched on DVD and they have been analysed as all techniques used in all rounds and their numeric values according to a competition liner developed by researchers.

RESULTS: The most points are taken in the second round and the least are taken in the third round in semi final competitions.. While the least points are taken in the first round, in the second and thirds rounds, the same points are taken in final competitions.

Korea is the first in applying the pailding-in lap with 9 strokes–9 points. The second are Spain and Turkey with 5 strokes–5 points, United States and Brasil are the fourth with 4 strokes–4 points.

United States is applying Dwit Chagi technique most during semi final and final competititons with 4 strokes–4 points.

Through semi final and final competitions, Korea is applying most 3 naeryo chagi strokes and 2 dollyo chagi strokes techniques that are considered as upper level high difficult techniques.

CONCLUSIONS: Semi final and final competitions, the most applied technique is pailding. Sportswomen apply this tecnique as contra pailding, direct pailding and pailding- in lap mostly when they attack. Korean sportswomen make first applying 5 of 12 strokes in naeryo chagi and dollyo chagi techniques considered as upper level high difficult techniques during semi final and final competititons in world championship.

KEY WORDS: Video analysis, Taekwon-do, Competition

INTRODUCTION

While Taekwon do is translated as ‘the way of kicking and boxing’ literally, it is also defined as ‘combat art via speed, flying and turning kick’ in Korea. (Law 2004, Melhim 2001, Olson 1999, Chun 1975).

The history of Taekwon do goes back to 2000. the monuments on which Taekwondo doers expressed their art have been found on the walls of tomb belonged to Kogurya Dynasty (Chun, 1975). Until the end of the second world war, fighting arts were not known by European people so much, that those who took place in Pasific wars learned figthing arts made people interested in Taekwondo. In the of 1950’s to meet the demands for formal Taekwondo, a few Korean Taekwondo masters imigrated to the West (Lee, 1989). Thus, some parts of figthing arts were added fitness classes and applied in the USA (Olson 1999).

Taekwon do consists of sudden and symmetric action items in Karate, and more fluent and circular

action items in Kung Fu. Studens firstly learn main stopping, boxing and kicking techniques after that they start to learn how to combine this knowledge with boxing and regular acting without touching. As lon as Taekwondo doers develop their skill, techniques and knowledge, they act according to their belt level serials. There is a belt-colour system from beginner level (white belt) to advanced level (black belt). Advanced level sportsmen are distinguished being awarded with liens (dan) from one to ten in black-belt level (Law 2004).

Taekwon do or olympic Taekwon do competition is a complete touch sports in which winner is defined by high score or knock-out. Points are gained by means of kicks and fists when they are done in the area that is regarded as legal. In a Taekwon do competition, in general, most points are gained by means of kick techniques more (approximately 80%, 90%) rather than boxing techniques. Sportsmen must produce enough power to get points from these actions (Koh, Watkinson 1999).

In researches done before, it is emphasized that Taekwon do training and Taekwon do poomses (action series that come one after the other) belonged to general Taekwon do improve cardiorespirator durability and general physical talent (Pieter 1990, Young 1992, Melhim 2004).

Improvement of Taekwon do: after it has been built up olympic sports statue by international olympic assembly: it has become very popular fighting art in the world. Many countries have given importance to it and each day with one million participant, it has been applied at all age groups (Melhim 2001, Olson 1999).

MATERIAL AND METHOD

FINDINGS

Table 1: World Taekwon Do Championship, 47 Kg Women, used techniques in Semi Final and Final Competitions and Dispersion of Points

47 kgs		Round	Contra pailding	Direct pailding	Pailding in lap	Naeryo Çhagi	Kontra dwit çhagi	Ten steps pailding	TTL PN
M GER	SEMI FINAL	1.raund		1					2
		2.round		1					
		3.round	-	-	-		-	-	
K ESP	SEMI FINAL	1.round	-	-	-		-	-	4
		2.round							
		3.round	4	-	-		-	-	
M KOREA	SEMI FINAL	1.oaund		1					5
		2.round		1		1*2			
		3.round		1					
K USA	SEMI FINAL	1.round			1				3
		2.round					1		
		3.round					1		
M ESP	FINAL	1.round	-		-	-	-		4
		2.round					1	1	
		3.round		1			1		
K KOREA	FINAL	1.round	-	-	-	-	-	-	1
		2.round		1					
		3.round	-		-	-	-	-	
GENERAL TOTAL POINTS			4	7	1	1	4	1	19

SEMI FINAL(GER-ESP): In 1. round, 1 direct pailding but red corner did not use any scorer techniques; in 2. round 1 direct but red corner did not use any scorer techniques; in 3. round blue corner did not use any scorer techniques and red corner used 4 contra paildings as technique.

SEMI FINAL(KOREA-USA): In 1. round, 1 direct pailding for 1 pailding in lap; in 2. round 1 direct

The video analyse of 32 women who won semi final and final of election competitions in 10th Women Taekwon do world championship that was held in Madrid, Spain in 2005 has been done.

All semi final and final recorded by World Taekwon Do Federation have been watched on DVD and they have been analysed as all techniques used in all rounds and their numeric values according to a competition liner developed by researchers.

Examining the frequency of applied techniques in all rounds in the competitions, that countries which won the games used mostly which techniques and their numeric values have been researched.

pailding and 1 naeryo çhagi for 1 contra dwit çhagi; in 3. round 1 direct pailding for 1 contra dwit çhagi was used as technique.

FINAL(ESP-KOREA): In 1. round, neither sportwomen scored. In 2 round 1 contra dwit çhagi and 1 pre-step pailding for 1 direct pailding; in 3. round 1 direct pailding was used as technique but red corner could not score.

Table 2: World Taekwon Do Championship, 51 Kg Women, used techniques in Semi Final and Final Competitions and Dispersion of Points

51 kg.		Roaround	Contra pailding	Direct pailding	Pailding in lap	Tolyo	Contra Double Pailding	Contra dwit çhagi	TTL PN
M AUT	SEMI FINAL	1.round		2					4
		2.round	1					1	
		3.round	-	-	-	-	-	-	
K CHN	SEMI FINAL	1.round	3						9
		2.round	3	1					
		3.round	2						
M ESP	SEMI FINAL	1.round		1	1				5
		2.round			1		1	1	
		3.round	-	-	-	-	-	-	
K CUB	SEMI FINAL	1.round	-	-	-	-	-	-	2
		2.round	1		1				
		3.round	-	-	-	-	-	-	
M ESP	FINAL	1.round	-	-	-	-	-	-	2
		2.round	1	-	-	-	-	-	
		3.round					1		
K CHN	FINAL	1.round	-	-	-	-	-	-	3
		2.round				1*2			
		3.round		1					
GENERAL TOTAL POINTS			11	5	3	1	2	2	25

SEMI FINAL(AUT-CHN): In 1. round, 2 direct paildings for 3 contra paildings; in 2. round 1 dwit çhagi and 1 contra pailding for 1 direct pailding used as techniques. In 3. round blue corner did not use any scorer techniques and red corner used 2 contra paildings as technique.

SEMI FINAL(ESP-CUB): In 1. round, 1 direct pailding for 1 pailding in lap bur red corner did not use

any techniques. In 2. round 1 contra double pailding and 1 contra dwit çhagi and 1 pailding in lap for 1 contra pailding and 1 pailding in lap used as techniques. In 3. round neither sportwomen scored.

FINAL (ESP-CHN): In 1. round, neither sportmen scored. In 2 round 1 contra pailding but red corner did not use any techniques; in 3. round 1 double pailding for 1 dollyo çhagi were used as techniques.

Table 3 World Taekwon Do Championship, 55 Kg Women, used techniques in Semi Final and Final Competitions and Dispersion of Points

55 kg.		Round	Contra pailding	Direct pailding	Pailding in lap	Naeryo Çhagi	TTL PN
M EGY	SEMI FINAL	1.round	-	-	-		1
		2.round	-	-	-		
		3.round			1		
K TUR	SEMI FINAL	1.round		1	1		3
		2.round	1				
		3.round	-	-	-		
M KOREA	SEMI FINAL	1.round	2		1		7
		2.round			2	1*2	
		3.round	-	-	-	-	
K CAN	SEMI FINAL	1.round	-	-	-	-	1
		2.round			1		
		3.round	-	-	-	-	
M TUR	FINAL	1.round	1		1		7
		2.round			1		
		3.round	1	1	2		
K KOREA	FINAL	1.round		2	1		8
		2.round	1		1	1*2	
		3.round	1				
GENERAL TOTAL POINTS			7	4	12	2	27

SEMI FINAL(EGY-TUR): In 1. round, blue corner did not score but red corner 1 direct paildings and 1 pailding in lap used as technique; in 2. round, blue corner did not score but red corner 1 contra pailding used as technique; in 3. round red corner did not use any scorer techniques and blue corner used 1 pailding in lapas technique.

SEMI FINAL(KOREA-CAN): In 1. round, 1 contra pailding and 1 pailding in lap but red corner did not use

any techniques; in 2. round 2 paildings in lap and 1 naeryo çhagi for 1 pailding in lap used as techniques; in 3. round neither sportwomen scored.

FINAL(ESP-KOREA): In 1. round, 1 contra pailding and 1 pailding in lap for 2 direct paildings and pailding in lap; In 2. round 1 pailding in lap for 1 contra pailding, 1naeryo chagi and 1 pailding in lap; in 3. round 1 contra pailding, 1 direct pailding and 2 pailding in lap for 1 contra pailding used as techniques.

Table 4. World Taekwon Do Championship, 59Kg Women, used techniques in Semi Final and Final Competitions and Dispersion of Points

59 kg.		Raund	Contra pailding	Direct pailding	Auger pailding	Pailding in lap	Puša	Doll yo	Naery o Çhagi	Double ailding	Contra dwit çhagi	Ten Contra paildin gs	TTL PN
M USA	SEMI FINAL	1.round				1					1		8
		2.round				2							
		3.round	1						1*2		1		
K CAN	SEMI FINAL	1.round		1									3
		2.round				1							
		3.round				1							
M SENE GL	SEMI FINAL	1.round	-	-	-	-	-	-	-	-	-	-	0
		2.round	-	-	-	-	-	-	-	-	-	-	
		3.round	-	-	-	-	-	-	-	-	-	-	
K KOR E	SEMI FINAL	1.round								2			12
		2.round	2	1	1			2*3					
		3.round	-	-	-	-	-	-	-	-	-	-	
M KOR E	FINAL	1.round	1										2
		2.round				1							
		3.round	-	-	-	-	-	-	-	-	-	-	
K USA	FINAL	1.round					1					1	3
		2.round										1	
		3.round	-	-	-	-	-	-	-	-	-	-	
GENERAL TOTAL POINTS			4	2	1	6	1	2*3	1*2	2	2	2	28

SEMI FINAL(USA-CAN): In 1. round, 1 pailding in lap, 1 contra dwit çhagi for 1 direct pailding; in 2. round 2 paildings in lapfor 1 pailding in lap; in 3. 1 contra dwit çhagi, 1 contra pailding and 1 naeryo chagi for 1 pailding in lap used as technique.

SEMI FINAL (SENEGAL-KOREA): In 1., 2. and 3. rounds blue corner could not score but red corner, in 1. round 2 double pailding, in 2. round, 2 contra

paildings, 1 direct pailding, 1 screw pailding and 2 dollyo çhagi used as techniques; in3. round neither sportwomen scored.

FINAL(KOREA-USA): In 1. round, 1 contra pailding for 1 pre-contra pailding and 1 pusa used as techniques. In 2 round 1 pailding in lap for 1 pre-contra pailding; ; in 3. round neither sportwomen scored.

Table 5 World Taekwon Do Championship, 63 Kg Women, used techniques in Semi Final and Final Competitions and Dispersion of Points

63 kg.		Round	Contra pailding	Direct pailding	Pailding in lap	Dollyo	Contra dwit çhagi	double pailding in front	ten contra paildings	TTL PN
M AUS	SEMI FINAL	1.round			1					2
		2.round	-	-	-	-	-	-	-	
		3.round			1					
K TDE	SEMI FINAL	1.round	1		2					8
		2.round							1	
		3.round					1		3	

M THA	SEMI FINAL	1.round	1							3
		2.round	1							
		3.round	1							
K MEX	SEMI FINAL	1.round						1		4
		2.round	-	-	-	-	-	-	-	
		3.round	2	1						
M TDE	FINAL	1.round	-	-	-	-	-	-	-	3
		2.round			1					
		3.round				1*2				
K MEX	FINAL	1.round	-	-	-	-	-	-	-	4
		2.round	2							
		3.round	2							
GENERAL TOTAL			10	1	5	1*2	1	1	4	24

SEMI FINAL (AUS-TDE): In 1. round, 1 pailding in lap for 1 contra pailding and 2 paildings in lap; in 2. round blue corner did not use any scorer techniques and red corner used 1 pre-contra pailding; in 3. round 3 pre-contra paildings and 1 contra dwit chagi used as techniques.

SEMI FINAL (THA-MEX): In 1. round, 1 contra pailding for 1 double pailding in front; in 2. round 1

contra pailding for 1 contra pailding but red corenr did not score; in 3. round 1 contra pailding for 2 contra paildings and 1 direct pailding used as techniques.

FINAL (TDE- MEX): In 1. round, neither sportmen scored. In 2 round 1 pailding in lap for 2 contra paildings; in 3. round 1 pailding in lap for 1 contra paildings used as techniques.

Table 6 World Taekwon Do Championship, 67 Kg Women, used techniques in Semi Final and Final Competitions and Dispersion of Points

67 kg.		Round	Contra pailding	Direct pailding	Pailding in lap	Naeryo Çhagi	Contra dwit çhagi	Ten contra paildings	TTL PN
M FRSA	SEMI FINAL	1.round	-	-	-	-	-	-	2
		2.round	2						
		3.round	-	-	-	-	-	-	
K CRO	SEMI FINAL	1.round	-	-	-	-	-	-	2
		2.round			1				
		3.round		1					
M ESP	SEMI FINAL	1.round	-	-	-	-	-	-	0
		2.round	-	-	-	-	-	-	
		3.round	-	-	-	-	-	-	
K KORE	SEMI FINAL	1.round	1					2	6
		2.round	1		1				
		3.round						1	
M FRSA	FINAL	1.round	-	-	-	-	-	-	3
		2.round	-	-	-	-	-	-	
		3.round	2		1				
K KORE	FINAL	1.round	-	-	-	-	-	-	7
		2.round	1		1				
		3.round				1*3	1	1	
GENERAL TOTAL POINTS			7	1	4	1*3	1	4	20

SEMI FINAL(FRSA-CRO): In 1. round, neither sportwomen scored; in 2. round 2 contra paildings for red corner's 1 pailding in lap used as techniques; in 3. round blue corner did not use any scorer techniques and red corner used 1 direct pailding as technique.

SEMI FINAL(ESP-KOREA): In 1. 2. and 3. rounds blue corner did not score but red corner in 1. round, 2 pre-contra pailding and 1 contra pailding; in 2. round 1

contra pailding and 1 pailding in lap; in 3. round 1 pre-contra pailding used as technique.

FINAL(FRSA-KOREA): In 1. round, neither sportwomen scored. In 2 round blue corner could not score and red corner 1 pailding in lap and 1 contra pailding used as techniques; in 3. round 2 contra paildings and 1 pailding in lap for 1 naeryo chagi, 1 pre-contra pailding and 1 contra dwit chagi were used as techniques.

Table 7. World Taekwon Do Championship, 72 Kg Women, used techniques in Semi Final and Final Competitions and Dispersion of Points

72 kg.		Round	Contra pailing	Direct pailing	Pailing in lap	Contra Dollyo	Contra Double pailing	TTL PN
M GBR	SEMI FINAL	1.round	1					2
		2.round					1	
		3.round	-	-	-	-	-	
K KORE	SEMI FINAL	1.round	-	-	-	-	-	1
		2.round		1				
		3.round	-	-	-	-	-	
M BRA	SEMI FINAL	1.round	-	-	-	-	-	5
		2.round			1			
		3.round			2	1*2		
K ESP	SEMI FINAL	1.round		1				4
		2.round			1			
		3.round			2			
M GBR	FINAL	1.round	2					5
		2.round	1		1			
		3.round			1			
K BRA	FINAL	1.round	1					5
		2.round	3					
		3.round			1			
GENERAL TOTAL POINTS			8	2	9	1	1	22

SEMI FINAL(GBR-KOREA): In 1. round, 1 contra pailing but red corner did not score; in 2. round 1 contra double pailing for 1 direct pailing used as techniques; in 3. round neither sportwomen scored.

SEMI FINAL(BRA-ESP): In 1. round, blue corner did not score but red corner 1 direct pailing used; in 2. round 1 pailing in lap for 1 pailing in lap; in 3. round

1 contra dollyo chagi and 2 pailings in lap were used as techniques.

FINAL(GBR-BRA): In 1. round, 2 contra pailings for 1 contra pailing; In 2 round 1 contra pailing and 1 pailing in lap for 3 contra pailings; in 3. round 1 pailing in lap for 1 pailing in lap were used as techniques.

Table 8. World Taekwon Do Championship, +72 Kg Women, used techniques in Semi Final and Final Competitions and Dispersion of Points

+72 kg.		Round	Contra pailding	Direct pailding	Pailding in lap	Contra Dollyo	Contra dwit çhagi	Ten Contra paildings	TTL PN
M BEL	SEMI FINAL	1.round		1			1		5
		2.round				1*2			
		3.round			1				
K KORE	SEMI FINAL	1.round						1	3
		2.round	1						
		3.round			1				
M CHN	SEMI FINAL	1.round			1				3
		2.round						1	
		3.round			1				
K PER	SEMI FINAL	1.round			1				5
		2.round	1		1		1		
		3.round					1		
M P.RICO	FINAL	1.round	-	-	-	-	-	-	0
		2.round	-	-	-	-	-	-	
		3.round	-	-	-	-	-	-	
K KORE	FINAL	1.raund				1*3			3
		2.round	-	-	-	-	-	-	
		3.round	-	-	-	-	-	-	
GENERAL TOTAL POINTS			2	1	6	2	3	2	19

SEMI FINAL(BEL-KOREA): In 1. round, 1 direct paiking and 1 contra dwit chagi for 1 pre-contra paiking; in 2. round 1 contra dollyo chagi for 1 contra paiking used as techniques; in 3. round 1 paiking in lap for 1 paiking in lap used as technique.

SEMI FINAL(CHN-PER): In 1. round, 1 paiking in lap for 1 paiking in lap; in 2. round 1 pre-contra paiking for 1 contra paiking and 1 contra dwit chagi and 1 paiking in lap; in 3. round 1 paiking in lap for 1 contra dwit chagi used as techniques.

FINAL(P.RICO-KOREA): In 1. 2. and 3. rounds Porto Rico could not score but in 1. round Korea used 1 contra dollyo chagi as technique.

DISCUSSION AND CONCLUSION

32 women took place in semi final and final in the end of election competitions in 10th Women Taekwon do world championship that was held in Madrid, Spain in 2005.

Total technic points throughout semi final final competitions is 180. When the dispersion of this total point is regarded for all rounds of semi final and final competitions, dispersion is seen as in 1. round of semi final is 36, in 2 round 49 and in 3. round 35. Totally, it is 120; in semi final, 2. round is the one in which most points were scored and it is 3. round in which least points were scored. While scorall growing is seen in 1. and 2. rounds, in 3. round, winner side of game makes the game slow and slow. As for final, in 1. round 14 points, 2.round 23 and 3. round 23, totally 60 points were scored; it is seen in final that the least points were scored in 1. round but in 2. and 3. rounds, same points were scored. That less points were scored in semi final rather than final shows us that it can be thought that that meeting of equal powers and the result defines the champion possibly effective.

According to total point, contra paiking with 53 takes the first order since it is the most applied one, paiking in lap with 46 takes the second, direct paiking with 23 takes the third, dwit chagi with 13 takes the fourth and pre-contra paiking with 12 takes the fifth, dollyo chagi with 14 points by 7 hits takes sixth, pre-contra paiking with 6 points by 6 hits takes seventh order. Dollyo chagi and naeryo chagi which are the hits onto head techniques take 2 points by one hit but contra mono hit takes 3 points.

As it is seen at Table 1, in 47 kgs women semi final and final competitions, Spain is the country which used contra paiking techniqu most. Korea with 4 points is which used direct paiking technique. In semi final competition, the U:S:A is took 2 points with contra dwit chagi technique and Spain took 2 points with contra dwit chagi technique. Additionally, Korea used high level hit on head dollyo chagi technique which is thought highly difficult in semi final.

According to Table 2, in 51 kgs women semi final and final competitions, according to general total point, contra paiking with 11 points takes the first order. Direct paiking takes the second with 5 points and paiking in lap technique with 3 points takes the

third one. China is which used most paiking technique in semi final with 8 points. Austria is which used direct paiking technique took 2 points and China used this technique in both semi final and final each one and took 2 points. Moreover, China used high level hit on head dollyo chagi technique which is thought highly difficult in 2. round in final. When we look at the dispersion of points and used techniques in final semi final competitions, paiking in lap takes the first order with 12 points. Contra paiking takes the second with 7 points and direct paiking takes the third with 4 points. 6-point-part of paiking in lap technique is applied in semi final. Turkey is which used most paiking in lap with 4 points in final and Korea is which applied this technique with 3 points in semi final. 4-point-part of contra paiking technique was scored in final and 3-point-part of it was scored in semi final. Korean sportwoman scored 2 points by 2 hits with contra paiking in semi final and Turkey scored 1 point by 1 hit in 2. round. In final, Turkey scored 2 points each 1 hit in 1. and 3. rounds, and Korea scored 2 points each 1 hit in 2. and 3. rounds. In final competition, direct paiking is the most applied technique. Korea scored 2 points by 2 hits in 1. round and Turkey scored 1 point by 1 hit in 3. round. Moreover, Korean sportman using high level hit on head naeryo chagi technique which is thought highly difficult scored 4 points using twice in each 2. rounds in semi final and final. In 59 kgs women semi final and final competitions, according to techniques used and the dispersion of the points, paiking in lap that used most took the first place with 6 points, and contra paiking was the second with 4 points. 5-point-hit of paiking in lap and 3-point-hit of contra paiking techniques occurred in semi final competitions. While American sportwoman made a hit on to head by Naeryo chagi technique which is regarded as high-difficult technique in 3. round in semi final, Korean sportwoman made 2 hits onto head by Dollyo chagi technique in 2. round in semi final.

According to Table-5, in 63 kgs women semi final and final competitions, techniques used and the dispersion of the points, contra paiking that used most took the first place with 10 points. Paiking in lap was the second with 5 points and pre-contra paiking was the third with 4 points. Mexico is which used most paiking technique in semi final and final with 6 points and according to general total point, these techniques were used in semi final most. While 4-point-part of paiking in lap technique occurred in semi final, all hits of pre-contra paiking occurred in semi final. TDE which was blue corner made a hit onto head by dollyo chagi technique which is regarded as high- difficult technique in 3. round in final.

When we look at Table-6, 67 kgs women semi final and final competitions, techniques used and the dispersion of the points, contra paiking that used most took the first place with 7 points by 7 hits. Paiking in lap and pre-contra paiking techniques were

the second. In general average, while 4-point-part of contra palding technique by 4 hits of total 7 points by 7 hits occurred in semi final, 3-point-part by 3 hits of it occurred in final. 2-point-part of palding in lap technique by 2 hits occurred in semi final and other 2-point-part by 2 hits occurred in final. Korea is which used most palding technique in semi final and final with total 3 points by 3 hits. In general average, while 3-point-part of pre-contra palding technique of total 4 points by 4 hits occurred in semi final, 1-point-part of it occurred in final.

In 72 kgs women semi final and final competitions, techniques used and the dispersion of the points can be seen at Table-7. Palding in lap that used most took the first place with 9 points by 9 hits, contra palding technique was the second with 8 points by 8 hits. 6-point-part of palding in lap technique by 6 hits occurred in semi final and other 3-point-part by 3 hits occurred in final. 7-point-part of contra palding technique by 7 hits occurred in final and Brazil is which used most palding technique. . Moreover, Brazilian sportswoman used high difficult hit onto head, contra dollyo chagi technique in 3. round in semi final.

When we examine Table-8, +72 kgs women semi final and final competitions, techniques used and the dispersion of the points, palding in lap that used most took the first place with 6 points by 6 hits. Contra dwit chagi was the second with 3 points by 3 hits and pre-contra palding was the third with 2 points by 2 hits and contra palding, and contra dollyo technique was the fourth with 4 points by 2 hits. Palding in lap technique was used only in semi final competitions by the sportswomen from Porto Rico, China, Korea and Belgium. In semi final, Porto Rico which was red corner scored 2 points with palding in lap technique and Chine scored 2 points with hits. One of the other 2 points was scored by Korea which was red corner and the other one point was scored by Belgium which was blue corner. When we examine contra dwit chagi technique, in total, 3-point-hits were made in semi final. In red corner, The sportswoman from Porto Rico scored 2 points by 2 hits she did in contra dwit chagi and in other semi final, the sportswoman from Belgium in blue corner scored 1 point by 1 hit. As it has been seen, contra palding and pre-contra palding techniques were applied in semi final. Moreover, while sportswoman from Belgium used 1 contra dollyo chagi technique in semi final, Korean sportswoman used one hit onto head, applying dollyo chagi technique in final.

Korea is which used most dollyo chagi and naeryo chagi techniques which are hitting onto head techniques in semi final and final. Korea is that is at the first order applying palding in lap, contra palding, direct palding and pre-contra palding techniques most. The USA is which applied Dwit chagi technique most and at the first order in use this technique.

Korea is which took the first place with 11 points by 11 hits using contra palding technique most

and China is the second with 8 points by 8 hits. The third one is Mexico with 6 points by 6 hits and Spain is the fourth with 5 points by 5 hits. When we consider direct palding technique, again Korea is the first with 8 points by 8 hits in semi final and final and Spain is the second with 3 points by 3 hits. Again Korea is the first in applying palding in lap with 9 points by 9 hits. Turkey Spain are the second with 5 points by 5 hits and The USA and Brazil are the third with 4 points by 4 hits. The USA is which used most dwit technique with 4 points by 4 hits in semi final and final. Korea is the first in applying pre-contra palding most with 5 points by 5 hits in semi final and final and TDE is the second with 4 points by 4 hits and the USA is the third with 2 points by 2 hits.. Korea is applying most with 3 Naeryo chagi and 2 dollyo chagi hits which are regarded as high- difficult technique in semi final and final. 5 Korean sportswomen were in the final match and three of them became champion and two of them became the second. As a final, palding is the general technique which was women world Taekwon do championship. Sportswomen used palding technique mostly in attacking as contra palding, direct palding and palding in lap. Koh and Watkinson (1999) stated that total 20 hitting onto head techniques were used in 1999 World Taekwon do Championship, in semi final and final competitions but in 2005 10th women world Taekwon do championship, in semi final and final competitions, total 12 hitting onto head techniques were used. Via Korean sportswomen who applied naeryo chagi and dollyo chagi which are considered as high difficult techniques, Korea was the country at first order which did 5 of 12 hits using these techniques.

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THE IDENTIFICATION OF THE VALUE DIMENSIONS OF THE HIGH PERFORMANCE GOALKEEPER PATTERN

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ABSTRACT

Selection and training of goalkeepers starting from an early age is an up-to-date scientific research theme, taking into account the role and functions of these players in the modern football game. In fact the tendencies and characteristics in the development of the world football game implies a large set of measures and concrete solutions regarding orientation, initial selection, training and participation in competitions, of the “human material”, promoted in the sports of performance in general and in the football of performance in special. This kind of demand is not self accomplished and moreover it will not be put into practice if the following adjacent problematic of our thesis is not taken into account.

OBJECTIVE:

1. Establishing the pattern of the football goalkeepers of high performance.
2. Identify the favouring skills for the position of goalkeeper and of the criteria of evaluation.
3. Analyze the skills conducing to high performance in children, ages 10 to14.
4. Design selection criteria for goalkeepers at an early age.
5. Drawing up programs of initiating-training of goalkeepers.
6. Implementation the programs.
7. The attained results printed in final draft.
8. Elaboration of the theses in a final form.

RESEARCH METHODS AND PROCEDURES: For achieving and accomplishing purposes of the research, the following methods of research have been used:

- Methodology of bibliographic study; Pedagogical observation method; Mesurement method; Experimental method; Study case method; Statistic – matematical method of processing and interpretation of data and graphical method.

RESULTS: Following the study of the literatur of speciality, the profiles of the football goalkeeper of high performance has been established and the favouring natural dispositions for this position and their evaluation criteria have been identified. We have focused on identifying the bio-psycho-social parameters liable to be noted in establishing the profile of the high-performance goalkeeper on national and international plan.

At the basis of this models were the data gathered and processed on 10 goalkeepers in the World football and goalkeepers in the League I of the roumanian championship, out of which we chose 10 with a high competitional value, in order to be compared to international models and at the same time to be points of reference in the orientation of juniors being in this position. We found data for the following dimensions of the pattern: weight, size, breasts, proportions, chest perimeter, palm lenght, biacromial and bitrohanterian diameter.

DISCUSSION AND CONCLUSIONS: We can say that the ideal pattern of a goalkeeper is characterised by the following natural dispositions:

Anthropometric: size, proportions, palm lenght, breasts perimeter, biocromial diameter, bitrohanterian diameter.

Physical qualities: speed in all kinds of manifestation, mainly speed of reaction, skills, agility, high jump, flexibility, endurance, power.

Physiological: cardiovascular health, funcțional, aerobic, anaerobic, effort capacity

Psyhomotric qualities: body scheme, general and segmented coordination capacity, space-time perception, quickness of movements, anticipation capacity.

Psychical: distributive attention, self control, stress resistance, capacity of learning/assimilating, passion for the game, emotional control.

KEY WORDS: goalkeeper, high performance, the value dimensions.

Reason of choosing the theme

We took up this theme starting from seeing that :

- the roumanian literature of speciality and scientific research treats poorly the problem of

selection and training of the football goalkeepers.

- it is a main position, the goalkeeper being the last defender, the player responsible of the fate of the game in many of its moments.
- the large number of teams needing players for this position (the goalkeepers crisis at Steaua, Dinamo, Rapid, the National team).
- the change in the motive structure of the game, which claims for the position of goalkeeper, tall sportsmen, strong and quick in action.
- the possibility of developing a pertinent experiment within the teams in Constanta district, mainly at junior level.

Purpose, objectives and tasks of the research

Purpose of research

Optimising the process of orientation, selection and initiation in the first formative stages of the football goalkeepers.

Objectives of the research

9. Establishing the pattern of the football goalkeepers of high performance.
10. Identify the favouring skills for the position of goalkeeper and of the criteria of evaluation.
11. Analyze the skills conducing to high performance in children, ages 10 to 14.
12. Design selection criteria for goalkeepers at an early age.
13. Drawing up programs of initiating-training of goalkeepers.
14. Implementation the programs.
15. The attained results printed in final draft.
16. Elaboration of the theses in a final form.

Hypotheses of the research

All these statements led us to present the following hypotheses of the research:

- **the favouring skills in taking the position of football goalkeepers, have to be first, identified within the profiles of the high performance goalkeepers. These profiles can be considered references for all stages of selection and formation of the players for the position of goalkeepers.**
- **the processes of orientation and selection of goalkeepers two types of favouring skills are necessary, that is:**
 - natural disposition based on constitution anthropometry and nervous system analyser characteristics, preoperational coordinative dispositions and motive intelligence.
 - those liable to being acquired by training or determined by the social environment and psycho-social field. Between the disposition categories there is a strong bond and continuity.

Note

Out of the hypotheses of the theses, relevant aspects in the three aspects have been checked, namely:

- identification of the best models/ profiles of goalkeepers;
- identification of favouring skills in taking this position;
- evident favouring dipositions at an early age.

Research methods

For achieving and accomplishing purposes of the research, the following methods of research have been used:

- Methodology of bibliographic study;
- Pedagogical observation method;
- Mesurement method;
- Experimental method;
- Study case method;
- Statistic – matemathical method of processing and interpretation of data and graphical method.

Structure and succession of performed experiment

In the third stage of our research following the study of the literatur of speciality, the profiles of the football goalkeeper of high performance has been established and the favouring natural dispositions for this position and their evaluation criteria have been identified. We have focused on identifying the bio-psycho-social parameters liable to be noted in establishing the profile of the high-performance goalkeeper on national and international plan.

Getting the data for establishing the indicators of value, which indicate the profile of the goalkeeper in the international football, have been made making use of the e-mail and the scientific papers drawn up by different specialists and, for the roumanian players, we resorted to the medical records made by th National Centre of Sports Medicine and to the accounts of the coaches. Thus, in the end two types of models have been made up: international and national.

At the basis of this models were the data gathered and processed on 10 goalkeepers in the World football and goalkeepers in the League I of the roumanian championship, out of which we chose 10 with a high competitionl value, in order to be compared to international models and at the same time to be points of reference in the orientation of juniors being in this position. We found data for the following dimensions of the pattern: weight, size, breasts, proportions, chest perimeter, palm lenght, biacromial and bitrohanterian diameter.

The fourth stage of the research was concerned on organising the base experiment, done on 36 players betwee 10-14 years old, who are interested in the position of goalkeepers, for children and junior teams: F.C. Farul Constanta, F.C. Metalul Constanta, F.C. Real Navodari and F.C. Elpis Constanta. The admission

criteria in these groups: health status, children's motivation for practising football as goalkeeper. So, out of the 36 players that we studied, two groups were formed, experimental group (F.C. Farul Constanta and Metalul Constanta) and the witness group (Elpis Constanta and Real Navodari), each group having 18 players.

For the initial and final testing we made use of the following selection criteria:

- **Anthropometric:** size, weight, breasts proportions, chest perimeter at ease, palm length, biacromial and bitrohanterian diameter.
- **Physical qualities:** 30 m speed, high jump, 600 m endurance, 1000 m endurance, abdominal power, back power.
- **Technical abilities:** catching ball at ground level, at semi-height, at height, replacing the ball by rotation of the arm, replacing the ball from the ground by foot.

We initiated the testing of the experiment group and the witness group. After the initial testing we passed on to putting into practice, in the initial process/training, the operational projects.

After putting into practice the operational projects during a period of six months (January-June 2008) we made the final measurements in order to see the motive behaviour of the children.

Conclusions

Thus, it is confirmed the first hypothesis of the thesis, stating that if we want to make a rigorous and rational selection then we have to use as pertinent point of reference, the pattern of the best goalkeepers, both at national level and at the international one. In this respect, by media and coaches records we gathered data concerning fundamental dimensions of the football goalkeepers pattern.

We can say that the ideal pattern of a goalkeeper is characterised by the following natural dispositions:

Anthropometric: size, proportions, palm length, breasts perimeter, biacromial diameter, bitrohanterian diameter.

Physical qualities: speed in all kinds of manifestation, mainly speed of reaction, skills, agility, high jump, flexibility, endurance, power.

Physiological: cardiovascular health, functional, aerobic, anaerobic, effort capacity

Psychomotric qualities: body scheme, general and segmented coordination capacity, space-time perception, quickness of movements, anticipation capacity.

Psychical: distributive attention, self control, stress resistance, capacity of learning/assimilating, passion for the game, emotional control.

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OVERWEIGHT AND OBESITY. STUDY OF THE RELATIONSHIP BETWEEN BODY MASS INDEX AND LIVING HABITS IN SEDENTARY AND ACTIVE CHILDREN FROM 6 TO 9 YEARS

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ABSTRACT

The increase in the prevalence of obesity in children, adolescents and adults in many countries of the world, is alarming. The rate of prevalence of this disease in developed countries has been increasing dramatically.

OBJECTIVE: The primary aim of this study was to examine the overweight and obesity, connecting the data to exercise and sedentary activities in children aged between 6 and 9 years.

METHOD: The research sample includes 98 children (55 boys and 43 girls), age average 7.55 years old. To collect the data, we used: (i) Questionnaire to assess child practice habits (physical activity and/or sedentary life style),

(ii) Balance and (iii) meter high, for calculating the Body Mass Index (BMI). The cut-off points of overweight (25 Kg/m^2) and obesity (30 Kg/m^2) were defined throw BMI table (depending on age and sex). For the comparison of the statistical data, were used the One-Way Anova and Bonferroni tests and to evaluate the association between the dependent and independent variables we used the Spearman correlation coefficient.

RESULTS: The overweight and obesity prevalence in the studied sample was 38.8% in total, 48.8% in girls and 32.7% in boys. Significant results were found between the comparison BMI and the following variables: BMI in categories ($p=0.000$ for both sexes), age ($p=0.000$, for boys), spare time on physical activities ($p=0.002$, for boys). Only one association was found, between BMI and time spent at the computer ($p=0.05$, for 8 years old girls).

CONCLUSIONS: The results suggest that the prevalence of children with overweight and obesity is high. Factors like sex, age, time spare in physical activity and watching television, have influence on the variation of the BMI values. To prevent obesity reduction sedentary lifestyles and physical activities promotion are suggested.

Key Words: Overweight, Obesity, BMI, Physical Activity, Sedentary Activities.

INTRODUCTION

Throughout the world, including Portugal, there has been increased the prevalence of obesity in various age groups and different socioeconomic and educational levels. Industrialised countries face up, with a problem related to the individual, but also with society and the populations health, probably, caused by recent and constant people behavioural changes in lifestyle, especially those living in urban areas (Mota *et al*, 2005).

This increase of obesity, especially in childhood and youth, is intrinsically related to the increase in morbidity and mortality. Once, which are various diseases (hypertension, cardio-vascular, diabetes, osteoarthritis, certain types of cancer), which appear so early in the life of an individual. And thus, obesity is currently a concern for public health (Direcção Geral de Saúde, 2005).

However, recommendations are known to maintain a healthy weight: (i) balanced diet, (ii) regular physical activity and (iii) less sedentary habits of life, the truth is that the implementation of these practices is extremely difficult and complex. The results are not immediate, doesn't exist "miraculous" treatments. Above all, individual and personal efforts are needed. "Sacrifices" that often, the individual is not willing to accept and comply. Obesity is a problem with multiple causes and consequences, which needs to be prevented and controlled, the earlier possible.

Our work, attend to discuss some of the issues related to children and youth obesity. According to the aims of our study, check the levels of prevalence of overweight and obesity and relate these indices, with actives and sedentary children, aged between six and nine years. It was our hypothesis: (i) there are no differences in BMI relation to the age and sex; (ii) There are no differences in BMI, as the practice of physical activity and sedentary activities, considering the gender, and (iii) There are no associations between BMI, number of hours daily spent in the practice of sedentary activities and physical activities, taking into account the gender and age.

METHODOLOGY

Subjects

The selection of subjects was performed by non probabilistic method; the sample consists of ninety-eight children (fifty five males and forty three females). The age range was chosen for physiological reasons, social practices and, once, that by the age of six years is a fat return (natural), and changes to the level of BMI. These ages (six, eight and nine years old) are a sensitive stage in human development, in which several changes occur. Thus ages are favourable for the implementation of strategies for prevention and intervention at the level of obesity.

Experimental Design

All subjects were evaluated according to different parameters (i) anthropometric (weight and height), (ii) sociological and (iii) living habits.

The anthropometric measurements were made in accordance with the techniques of measurement displayed by Cole and Rolland-Cachera (2002), which stated, briefly: Children barefoot, underwear dressed, in the balance *Philips Electronic scale - HP5325 ®*; head positioned according to the plan of Frankfurt - line of sight perpendicular to the body, heels, buttocks and shoulder near the wall.

Sociological and living habits were assessed by applying an questionnaire (adapted from Padez *et al.*, 2005). To calculate the BMI, the result of the ratio between weight and height of the square, we apply the

$$\text{formula } \frac{\text{weight}}{(\text{height})^2}.$$

Statistical analysis

In order to analyze and describe the different variables was used statistics program, SPSS (social program for statistical studies) version 13.0. The data were analyzed and treated, taking into account two aspects: (i) descriptive analysis, and (ii) inferential analysis. In descriptive analysis, we use the parameters of central tendency (mean, absolute frequency, relative frequency) and dispersion (standard deviation). Analysis of adhesion to normality has been studied through *Kolmogorv-Smirnov* test. In inferential analysis and to compare the dependent variable (BMI) with the independent variables, we use the *One-Way*

ANOVA and the *Bonferroni* test with significant values for $p \leq 0.05$. The associations between the variables were analysed by the correlation coefficient, *Spearman R ρ* .

RESULTS

In total 30.6% of the sample of children have excessive weight and 8.2% are classified as obese. In females there are higher percentages of children with overweight and obese, compared to the same age boys, except at the age of 8 years old, that there are no girls obese. It appears that 38.8% of the sample shows values of weight in overweight or obesity. However, the prevailing rate is the highest relation to children weighing below the reference values (61.2%). In girls the relationship between BMI average and age is almost linear and shows a slight increase. For boys, from 6 to 8 years look to a very significant increase in BMI average, reducing between 8 and 9 years of age. Thus, we can see that the 9 years of age, the BMI average is similar in boys and girls.

We note that there are significant differences in the variables categorized BMI in both sexes ($p = 0.000$), age ($p = 0.001$), time spent in the practice of physical exercise ($p = 0.043$) and the time spent watching television ($p = 0.002$), in the last three, only for males are observed statistically significant results. For the BMI average, we can see that differ with gender and the various categories of the variable under study. Thus, in the variable BMI categorized, the obese category presents averages higher BMI both in males and in females ($\bar{x} = 23.2$ and $\bar{x} = 22.6$, respectively). In varying age, the male shows mean values of BMI higher at the age of eight years ($\bar{x} = 19.3$), while for females it at the age of nine years, the average BMI ($\bar{x} = 18.1$) is higher.

Through the *Bonferroni* test can see significant differences, between the various categories of variables. In BMI categorized, there are very significant differences ($p = 0.000$ or $p = 0.001$), among all categories and subcategories, except for girls, in the comparison of the category of obese overweight, which shows a statistically significant ($p = 0.014$). Regarding the age, we can see that only in males and in the category of six years, there are significant differences between the category of six and eight years ($p = 0.001$) and six nine years ($p = 0.028$).

As to the relationship between the variables under study, we can see that there is no association between BMI and the other variable, taking into account the gender and age of six and nine years. We found a positive relationship between BMI and high and the time spent on the computer, for the eight years age females.

According to the data the prevalence of children with overweight and obesity is 38.8% in total, corresponding to 48.8% for girls and 32.7% for boys. When comparing with studies in the same area (Padez *et al.*, 2005), the prevalence of overweight and obesity

is 31.6%, observing the Mediterranean countries (Spain (30%), Greece (31%), Italy (36%)) (International Obesity Task Force, 2002), found that our results do not differ, in percentages corresponding to excess weight and obesity. Chueca *et al.* (2002), referring to studies carried out in several countries show that between 5-10% of school-age children are obese. According to several authors (Malina, 2001; Zemel and Barden, 2001; Cole and Rolland-Cachera, 2002), body composition on the percentage of fat mass tends to increase with age, especially in women.

In comparisons made between BMI and the variables analyzed, we should mention that in our study, there are significant differences for both sexes and among all classes in the categorized BMI. As for age, only, significant differences were recorded for males and between categories of six to eight years and six with nine years of age. According to different authors (Bouchard, 2000; Malina, 2001), differences in BMI related to sex, are not significant during childhood, compared to those found in adolescence and adulthood. However, normally (if this process does not happen early) during the age of five - six years occur the return fat, which is highlighted by the increase in BMI values, both in boys as in girls. These changes to the development and maturation and body physiological, may explain the different values observed for both sexes and between the ages (Malina, 2001; Zemel and Barden, 2001; Guillaume and Lissau, 2002).

Concerning differences in BMI, on the physical activity and sedentary activities, we note that, just for the boys there are significant values, both in the variable time spent in physical activity as the time spent watching television. According to Moreira (2005) and Assis *et al.* (2006), the time of exposure to television, can be a relevant factor to the decline in physical activity and energy wear. It should be noted that the new reality of the education system and family structure, promotes the increase in the number of children who remain at home after school, for security reasons; what in turn, contributes to the increase in consumption of television, electronic games and use computers.

In the study of the associations between variables, only observed correlation between BMI and time spent on the computer for the girls at the age of eight years ($p = 0.005$). In contrast, it would be expected that the literature indicates, physical activity and other sedentary activities, are not associated with BMI. This fact may be due to subjects studied, belong only to a school in the city of Vila Real, as well as a constraint methodological terms of physical activity assessed by a questionnaire, may have modified the results once that the best methods are the most sensitive to the detection of the intensity and duration of physical activity sporadic or intermittent, such as the use of accelerometers, which for large samples also have limitations (very expensive, less practical) (Padez *et*

al., 2005; Carvalhal *et al.*, 2006). It is important to note that today, children have access to the computer or to search online, or to perform work to the school, at the age of eight years the children already can read and write, so that the use of computers makes more sense. In Portugal, it is more common, the girls are more applied (in the studies), compared to the same age boys. Apart from the fact on the Portuguese mentality, allow greater freedom to the boys, to play (especially outside the residence) and be with peers, than to girls. Usually boys tend to be more active than girls.

In conclusion the children studied shown very high prevalence of overweight and obesity, following the trend in the Country, in Europe and the World. Beyond this, there is a relationship between the levels of overweight and obesity, and the habits of physical activity and sedentary activities of the study children. The prevention of obesity should be among the priorities of public health. Prevention should include the encouragement of life styles more healthy. In particular, encouraging habits of practice of physical activity and reduction of sedentary habits and practices related to the television, computer and electronic games, for both sexes, in population in generally and especially at the young and children (sensitive ages).

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PREDICTION OF BODY COMPOSITION BASED ON SELF-ESTIMATED BODY IMAGE AND ACTIVITY INDEX RESULTS

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Abstract

STRATON ALEXANDRU. Prediction of Body Composition based on Self-Estimated Body Image and Activity Index results

Objective: The aim of this study was to examine, if there is a reliable prediction capacity of self-estimated body image and activity index (AI) results, for future changes in body composition (body fat percentage (BF), body mass index (BMI) and abdominal circumference (AC)), in Romanian university students.

Research Methods and Procedures: This study used 124 Romanian university students (27 males and 97 females). The body fat percentage was estimated using the skinfolds technique (accu-measure caliper). Current body image (CBI) and ideal body image (IBI) were self-estimated using a body shape representations from a figure rating scale and activity index was self-estimated using a questionnaire. Body image discrepancy (BID) was calculated by subtracting the ideal body image from the current body image. BMI was calculated to estimate the category of weight for each subject by using the Quetelet formula.

Results: CBI was correlated with BMI ($r = 0.655$ for men, $r = 0.761$ for women), with BF ($r = 0.611$ for men, $r = 0.638$ for women) and with AC ($r = 0.586$ for men, $r = 0.631$ for women). IBI was correlated with BMI ($r = 0.458$), BF ($r = 0.375$) and AC ($r = 0.297$), only for women. BID was correlated with BMI ($r = 0.631$ for men, $r = 0.564$ for women), with BF ($r = 0.612$ for men, $r = 0.48$ for women) and with AC ($r = 0.614$ for men, $r = 0.533$ for women).

Discussion and Conclusions: AI self-estimation have no relationship with BID and variables which controls body weight and fatness (BMI, BF and AC). BID and CBI self-estimation, reported to IBI self-estimation (which must be held constant), can be seen like predictors for changes in BMI, AC and BF values, for normal subjects. The results encourage a closer look at BID, and her relationship to BMI, BF and AC control.

Key Words: percentage of body fat, body mass index, abdominal circumference, body image discrepancy, current body image, ideal body image, activity index, self-estimation.

Introduction

One of factors that contribute to body composition changes, respectively to body fat percent grow up is physical inactivity or sedentary lives (Clinical Guidelines On The Identification, Evaluation, And Treatment Of Overweight And Obesity In Adults, The Evidence Report, 1998).

Waist circumference and abdominal sagittal diameter are much more correlated with abdominal visceral adiposity and cardiovascular risk, than waist to hip ratio (Pouliot M.C., Despres J.P., Lemieux S. et. al., 1994). Another studies shows that, BMI and waist circumference are strongly correlated with body fat percent, (Clinical Guidelines On The Identification, Evaluation, And Treatment Of Overweight And Obesity In Adults, The Evidence Report, 1998) at teenagers, in both sexes, than waist to hip ratio (Neovius M., Linne Y., Rossner S., (2004). Waist circumference is positively correlated with abdominal adiposity (Clinical Guidelines On The Identification, Evaluation, And Treatment Of Overweight And Obesity In Adults, The Evidence Report, 1998). Waist to hip ratio has no advantage than waist circumference, regarding health related risks (Identification, Evaluation, and Treatment of

Overweight and Obesity in Adults, The Practical Guide, 2000).

The tendency, for most studies is, that more young females are considering themselves overweight, than BMI normal values obtained by these females, in relation with young males (Bellisle F., Monneuse M.O., Steptoe A., Wardle J., 1995; Kiefer I., Leitner B., Bauer R., Rieder A., 2000; Sciacca J.P., Melby C.L., Hyner G.C., Brown A.C., Femea P.L., 1991; Tanaka S., Itoh Y., Hattori K., 2002). This produces a distortion of body image perception, on which, can reflect some eating disorders (Sciacca J.P., Melby C.L., Hyner G.C., Brown A.C., Femea P.L., 1991).

Obese and anorexic subjects significantly differ from normal subjects, in body size estimation, through body image method of analysis (Garner D.M., Garfinkel P.E., Stancer H.C., Moldofsky H., 1976).

Female subjects are more unsatisfied by body size, evaluated through body image analysis, than males (Cachelin F.M., Rebeck R.M., Chung G.H., Pelayo E., 2002). Most female and male subjects, including teenagers, consider actual body size to be in a social acceptable limits of body size, even if, for

many of them this doesn't match with ideal body size (Rand C.S.W. and Resnick J.L., 2000).

Becker D.M., Yanek L.R., Koffman D.M. and Bronner Y.C., (1999), reported significant correlation between BMI and body image on white and afro-American subjects, on both sexes. Body image average was the same in white and afro-American males, but afro-American females had an ideal body image significantly higher than white females. Riley N.M., Bild D.E., Cooper L. et al., (1998), had concluded that a higher level of BMI is associated with poor results in body image and body size estimation.

Between white and afro-american subjects exist differences in body image perception in relation with overweight, at subjects with age between 18.5 and 35 years old (Bhuiyan A.R., Gustat J., Srinivasan S.R., Berenson G.S., 2003). Guinn B., Semper T., Jorgensen L., Skaggs S., (1997), shows that, association between body image and body fat is significant and negative, in children with age between 13 and 15 years old.

Caucasian and Asian students estimated a bigger actual body image than ideal body image. Students Caucasian males doesn't obtained a discrepancy between actual body image and ideal body image than, Asian students males who estimated a smaller actual body image than ideal body image. Body image discrepancy is conditioned by sex and race (Barnett H.L., Keel P.K., Conoscenti L.M., 2001).

Duncan M.J., Al-Nakeeb Y., Nevill A. and Jones M.V., (2004), indicates that, at children with age between 11 and 14 years old, there is no significant relationship between body image and physical activity. A study realized on 1000 German children, with age between 14 and 18 years old, showed that, the practice of endurance exercises is correlated with a favorable estimation of body image (Kirkcaldy B.D., Shephard R.J., Siefen R.G., 2002).

The objective of this study is to examine, if there is a reliable prediction capacity of self-estimated body image and activity index (AI) results, for future changes in body composition (body fat percentage (BF), body mass index (BMI) and abdominal circumference (AC)), in Romanian university students.

Research Methods and Procedures

Participants

The study was conducted between 11.10.2004 and 17.12.2004.

The subjects were white Caucasian and students at faculties of Ovidius University in Constanta. The aims and methods of the study were explained to the participants, who chose freely to participate in this study. As a result, the sample included 127 students (97 females and 27 males), with age between 18 and 23 years old. The mean age for male subjects were $19^7 \pm 0^{11}$ (years^{months}) and for female subjects were $20^1 \pm 2^8$.

Anthropometry

Body height was evaluated with an error of 0.1 centimeters and body weight was evaluated with a calibrated digital scale, with an error of 0.25 kilograms. For this measurement the subjects were dressed summarily. AC was evaluated with flexible metric tape (taken parallel with the floor, at the level of the superior iliac crest and 1-2 cm. below the umbilicus) (Identification, Evaluation, and Treatment of Overweight and Obesity in Adults, The Practical Guide, 2000), three times consecutively (the average of this measurement has been the final result of AC measurement), with the subjects standing in orthostatic position with the abdomen completely relaxed.

BMI was calculated to estimate the category of weight for each subject by using the Quetelet formula (Dumitru G., 1997).

Percentage of body fat

Percent of body fat was estimated using skinfolds technique.

This technique consisted in calculation of body fat percent with Jackson & Pollock, 1978 (Jackson A.S. and Pollock M.L., 1978), equation, for male subjects and Jackson et al., 1980 (Jackson A.S., Pollock M.L., Ward A., 1980), equation, for female subjects. The abdominal (taken vertically with a broad grip, 5cm. lateral to the omphalion (centre of the umbilicus)), chest (taken obliquely along the natural cleavage line of the pectoral between the axilla and nipple) and thigh (vertical fold taken midway between the inguinal crease and proximal border of the patella) skinfolds were measured for male subjects and the triceps (vertical fatfold taken midway between the olecranon process and acromion process on the posterior aspect of the arm), suprailiac (slight diagonal fatfold taken immediately superior to the iliocristale) and thigh (vertical fold taken midway between the inguinal crease and proximal border of the patella) skinfolds were measured for female subjects. All measurements were taken on the right side of the body, three times consecutively, using accu-measure caliper. The average of these three measurements has been the final result of skinfold measurement.

Activity index

Activity index was estimated with a self-reported questionnaire, which was completed under the instructor's observations. The subjects had to indicate, on this questionnaire, the intensity, duration and frequency scores of physical activity daily practice. Activity index was then calculated, by multiplying the score for each category (Sharkey J.B., 1997).

The estimation of actual and ideal body image and body image discrepancy

Body image was estimated using two body shape representations from a figure rating scale, one for female subjects (Figure 1) (Fitzgibbon M.L.,

Blackman L.R., Avellone M.E., 2000) and one for male subjects (Figure 2) (Oja P. and Tuxworth B., 1995), which has contained nine body shape images. The body shape images were arranged in ascendant order, scored from 1 to 9, with 1 representing the skinniest figure and 9 representing the heaviest figure.

We asked the subjects to identify which figure most accurately represented her/his current body shape and which body shape the subjects desired.



Figure 1. Women body shapes



Figure 2. Men body shapes

Body image discrepancy (BID) was calculated by subtracting the ideal body image (IBI) from the current body image (CBI). The body image discrepancy scores could range from -8 to 8. The body image discrepancy scores bigger than zero indicated that, the current body image was heavier

then ideal body image. The body image discrepancy scores smaller than zero indicated that, the current body image was lighter than ideal body image. The body image discrepancy scores equals to zero indicated no body image discrepancy on subjects. The subjects chose the same body shape for current body image and for the ideal body image (Fitzgibbon M.L., Blackman L.R., Avellone M.E., 2000).

Statistical Analysis

Data are presented as the mean (M) \pm standard deviation (SD). Independent t test was used to examine the differences between sexes for all variables. To examine the relationship between AI, BID, IBI and CBI with BMI, AC and BF, Pearson correlation analysis was used, on both sexes separately and for each variable. Pearson correlation analysis was used, also for AI with BID. The significance level (α – alfa) was set at $p < 0.05$ (Thomas R.J. and Nelson J.K., 1996).

Results

In Table 1 is presented physical characteristics of the subjects.

For most variables, differences between sexes were significant (body height, $t = 9.838$; body weight, $t = 5.841$; BF, $t = 13.287$; FM, $t = 6.346$; FFM, $t = 11.498$; AC, $t = 3.565$; IBI, $t = 4.663$; BID, $t = 5.299$; AI, $t = 2.387$). Mean BMI was slightly higher for men, than women.

Table 1. Physical characteristics of the subjects

Variables	M \pm SD	
	Males (n = 27)	Females (n = 97)
Body height (cm)	1.789 \pm 0.078 ^{a)}	1.63 \pm 0.059
Body weight (kg)	66.074 \pm 11.135 ^{a)}	52.722 \pm 7.842
BMI (kg/m ²)	20.598 \pm 2.929	19.811 \pm 2.485
BF (%)	8.962 \pm 4.407 ^{a)}	21.886 \pm 4.704
FM (kg)	6.25 \pm 4.006 ^{a)}	11.806 \pm 4.085
FFM (kg)	59.824 \pm 8.207 ^{a)}	40.915 \pm 4.512
AC (cm)	78.848 \pm 7.831 ^{a)}	72.956 \pm 6.687
CBI	3.111 \pm 1.013 ^{b) c) d)}	3.464 \pm 1.051 ^{b) c) d)}
IBI	3.704 \pm 0.912 ^{a)}	2.825 \pm 0.677 ^{b) c) d)}
BID	-0.593 \pm 1.118 ^{a) b) c) d)}	0.639 \pm 0.868 ^{b) c) d)}
AI	39.037 \pm 25.226 ^{a)}	26.33 \pm 21.504

^{a)} differences between sexes, $p < 0.05$;

^{b)} correlated with BMI, $p < 0.05$;

^{c)} correlated with BF, $p < 0.05$;

^{d)} correlated with AC, $p < 0.05$.

BMI, body mass index; BF, body fat; FM, fat mass; FFM, free fat mass; AC, abdominal circumference; CBI, current body image; IBI, ideal body image; BID, body image discrepancy; AI, activity index; M, mean; SD, standard deviation; n, number of subjects.

CBI was correlated with BMI ($r = 0.655$ for men, $r = 0.761$ for women), with BF ($r = 0.611$ for men, $r = 0.638$ for women) and with AC ($r = 0.586$ for men, $r = 0.631$ for women). IBI was correlated with BMI ($r = 0.458$), BF ($r = 0.375$) and AC ($r = 0.297$), only for

women. BID was correlated with BMI ($r = 0.631$ for men, $r = 0.564$ for women), with BF ($r = 0.612$ for men, $r = 0.48$ for women) and with AC ($r = 0.614$ for men, $r = 0.533$ for women).

Table 2. Subjects' weight classification by BMI (kg/m^2) values

	Females		
	< 5 th percentile – underweight ^{*/**} n = 20	5 th to <85 th percentile – normal ^{*/**} n = 74	85 th to <95 th percentile - risk of overweight ^{*/**} n = 3
BMI M \pm SD	17.04 \pm 0.936	20.255 \pm 1.801	27.316 \pm 1.102
	Males		
	< 5 th percentile – underweight ^{*/**} n = 6	5 th to <85 th percentile – normal ^{*/**} n = 19	85 th to <95 th percentile - risk of overweight ^{*/**} n = 2
BMI M \pm SD	17.754 \pm 1.263	20.804 \pm 2.016	27.178 \pm 2.435

* CDC Growth Charts: United States; body mass index-for-age percentiles; boys and girls, 2 to 20 years;

** Classification of overweight and obesity by BMI; men and women, >20 years;

BMI, body mass index; M, mean; SD, standard deviation; n, number of subjects.

74 women and 19 men were situated in normal BMI values. Only 20 women and 6 men were situated in underweight BMI values and 3 women and 2 men were situated in risk of overweight BMI values (Table 2) (Kuczmarski R.J., Ogden C.L., Guo S.S., et al., 2002; Clinical Guidelines On The Identification, Evaluation, And Treatment Of Overweight And Obesity In Adults, The Evidence Report, 1998). For

underweight subjects BID was negative for both genders (-1.333 ± 1.033 for men and -0.25 ± 0.639 for women). For normal subjects BID was negative for men (-0.474 ± 1.073) and positive for women (0.824 ± 0.728) and for overweight subjects BID was positive for both genders (0.5 ± 0.707 for men and 2 ± 1 for women).

Table 3. Differences between BID categories for BMI (kg/m^2), AI, AC (cm) and BF (%)

BID categories	Males			
	BMI (kg/m^2)	AI	AC (cm)	BF (%)
Negative BID n = 15	19.908 \pm 1.257	40 \pm 21.112	74.933 \pm 4.804	6.933 \pm 2.845
No BID n = 10	21.599 \pm 2.801	41.8 \pm 32.183	81.37 \pm 6.55	10.432 \pm 4.515
Positive BID n = 2	26.849 \pm 2.9	18 \pm 2.828	95.6 \pm 5.515	16.832 \pm 0.986
BID categories	Females			
	BMI (kg/m^2)	AI	AC (cm)	BF (%)
Negative BID n = 9	17.048 \pm 1.509	19.778 \pm 17.845	67.922 \pm 6.496	18.296 \pm 6.589
No BID n = 31	18.92 \pm 1.808	26.258 \pm 20.414	69.69 \pm 4.526	19.841 \pm 3.002
Positive BID n = 57	20.731 \pm 2.446	27.404 \pm 22.714	75.526 \pm 6.554	23.566 \pm 4.433

BMI, body mass index; BF, body fat; AC, abdominal circumference; BID, body image discrepancy; AI, activity index; M, mean; SD, standard deviation; n, number of subjects.

Discussion

Compared with the anthropometric reference data 1988 – 1994 from United States (National Health and Nutrition Examination Survey, 2005), body height for our subjects was slightly higher for

men and slightly lower for women. The body weight was lower, for both men and women, compared with the corresponding values for Americans.

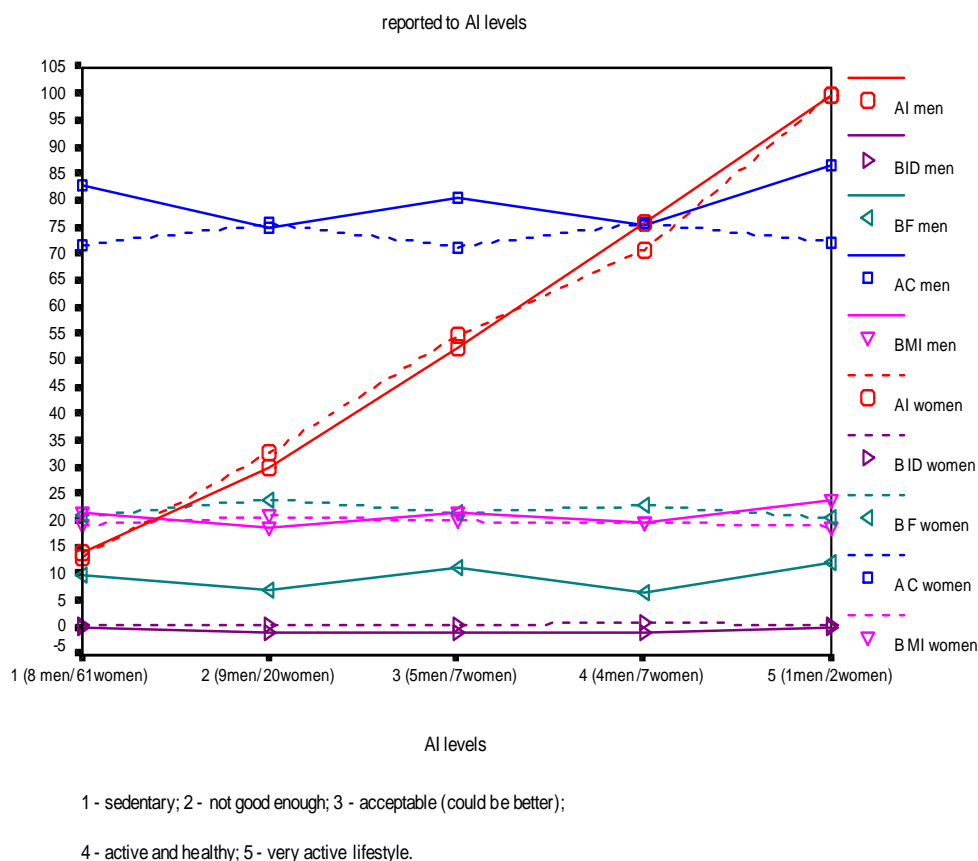
AC was the same for men and slightly higher for women, compared with average AC values for

Americans (Franks B.D. and Howley E.T., 1986). Compared with the anthropometric reference data 1988 – 1994 from United States (National Health and Nutrition Examination Survey, 2005), AC was lower for both genders.

Men are significant physically active then women, in self-estimation AI ($t = 2.387$). AI has no relationship with BMI, AC and BF, because this parameter doesn't correlates with BMI ($r = 0,069$ for men and $r = 0.075$ for women), AC ($r = -0.04$ for

men and $r = 0.105$ for women) and BF ($r = -0.02$ for men and $r = 0.102$ for women), in both genders (Table 1 and Figure 3). AI has, also, no relationship with BID, in both genders ($r = -0.168$ for men and $r = 0.113$ for women). Bhuiyan A. R., Gustat J., Srinivasan S.R. and Berenson G.S., (2003)., found that physical activity is not a significant predictor of body image perception.

Figure 3. Means evolution for AI, BID, BF, AC and BMI,



IBI was significantly heavier for men, then women ($t = 4.663$). There was no difference between women and men in CBI self-estimation. BID was significantly higher and positive for women, then men, who had a negative BID ($t = 5.299$). This shows that most of women supra-estimate CBI and most of men under-estimate CBI, reported to IBI.

Lower BMI values (lighter bodies) are associated with lower CBI self-estimation, reported to IBI self-estimation (negative BID). The same situation is also observed for normal BMI values in men. Normal BMI values for women and higher BMI values (heavier bodies) for men and women are associated with higher CBI self-estimation, reported to IBI self-estimation (positive BID). Women with normal weight is possible to have an interest in losing weight (especially from fat), compared with normal weight men, who probably want to gain some weight (especially from lean mass).

BID, CBI and IBI have positive relationships (correlations) with BMI, BF and AC, in women and only BID and CBI have positive relationships with BMI, BF and AC, in men (Table 1). Becker D.M., Yanek L.R., Koffman D.M. and Bronner Y.C., (1999), found that all Afro-Americans and white men and women have significant correlation between BMI and selected body image size.

Negative BID have associations with lower values for BMI, AC and BF, and positive BID have associations with higher values for BMI, AC and BF (Table 3). If BID have ascendant or descendent evolutions, then the body composition variables, BMI, AC and BF, will trend to have the same evolutions like BID, for normal subjects, only when IBI will keep the same values in time. Because BID express the relationship between CBI and IBI (subtracting IBI from CBI will have BID (Fitzgibbon M.L., Blackman L.R., Avellone M.E., 2000)), CBI will have almost the same evolutions like BID, and respectively like BMI, AC and BF, for normal students, only when IBI is held constant in time. BID and CBI self-estimation, reported to IBI self-estimation (which must be held constant), can be seen like predictors for changes in BMI, AC and BF values, for normal subjects.

Conclusions

Self-Estimated Body Image (Body image discrepancy (BID) and current body image (CBI)) trend to have good prediction capacity for changes in body composition (body fat percentage (BF), body mass index (BMI) and abdominal circumference (AC)), for normal subjects, but the reliability of this aspect is questionable and need more future research on this topic. Activity index has no prediction capacity for changes in body composition.

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REQUIREMENTS FOR THE ELABORATION OF THE SCIENTIFIC PAPERS

The experiment type paper

The research paper must include:

- **the title of the paper and the author** (authors) of the research; The title of the paper will be written with Times New Roman, Size 12, Bold, Align Left, The names of the author or authors of the research will be written with Times New Roman, Size 12, Bold, Align Left, one line under the title of the paper, preceded by the highest academic degree. Under the author's name, the department (departments) and institution (institutions) name will be written, through which the article can be assigned, the contact address and the e-mail of the person (persons) responsible with the manuscript mailing or reprint and the source of the material support in the form of the GRANTS (not more than 40 characters including spaces) if need be, with Times New Roman, Size 10, Align Left.
- **the structured abstract and 3-5 key words** will be written with Times New Roman, Size 10, Justified;
- **the introduction** and the object of the research will be written with Times New Roman, Size 10, Justified, two columns;
- **the hypothesis** (hypotheses) of the research, **the procedures and methods** of research (subjects, applied tests), **results, discussions, conclusions** will be written Times New Roman, Size 10, Justified, two columns;
- the **bibliography** will be written with Times New Roman, Size 10, Justified, two columns, First Line Indent 0cm, Hanging Indent 1cm, Left Indent 1cm. **The names of the articles will be written in italics.**

The essay type paper

The essay type paper must contain:

- **the title of the paper and the author** (authors) of the research; The title of the paper will be written with Times New Roman, Size 12, Bold, Align Left, The names of the author or authors of the research will be written with Times New Roman, Size 12, Bold, Align Left, preceded by the highest academic degree. Under the author's name, the department (departments) and institution (institutions) name will be written, through which the article can be assigned, the contact address and the e-mail of the person (persons) responsible with the manuscript mailing or reprint and the source of the material support in the form of the GRANTS (not more than 40 characters including spaces) if need be, with Times New Roman, Size 10, Align Left.
- **the unstructured abstract and 3-5 key words** will be written with Times New Roman, Size 10, Justified;
- **the introduction and the object of the research, the content, the conclusions** will be written with Times New Roman, Size 10, Justified, two columns;
- the **bibliography** will be written with Times New Roman, Size 10, Justified, two columns, First Line Indent 0cm, Hanging Indent 1cm, Left Indent 1cm. **The names of the papers/ articles will be written in italics.**

The chapters of the research paper will be written in Bold, **The diagrams and the tables** can be centered at the end of the paper. The accepted number of pages, including bibliography is of 6-8.

The paragraphs will have the dimensions of 1cm. (First Line indent 1cm, Hanging Indent 0cm, Left Indent 0cm). The borders of the page will be of 1,5cm up, down and right and 2,5cm left, and the **size of the page will be A4 (21cm x 29,7cm).**

The co-author is based on the substantial contribution to (a) creation and design or analysis and interpretation of the data, (b) creating the article's summary or the critical review of the article and (c) approval of the final version of the article in order for it to be published. The conditions (a), (b) and (c) must all be accomplished by each author. The general supervision of the research group is not enough to accomplish the condition of co-author. The members of the group that do not accomplish the condition of co-author can be mentioned, with their permission, at the section "Thanks".

The abstract and the key words

The abstract must not contain more than 150 words for unstructured abstracts (essay type) and 300 words for structured abstracts (experiment type). The abstract must be elaborated in English and Romanian (for Romanian authors). In the abstract there will be no abbreviations used.

The structured abstract must contain:

For the experiment type paper

- the author (authors) of the research and the title of the paper;
- the objective (objectives) of the research;
- the procedures and methods of research (subjects, applied tests);
- the results (main results);

For the essay type paper

- the author (authors) of the research and the title of the paper;
- the object of the research;
- the content of the research (short summary);
- conclusions (main conclusion);
- key words (between 3 and 5 key words, which punctuates

- discussions and conclusions (main discussions and the interest areas of the article); conclusions);
- key words (between 3 and 5 key words, which punctuates the interest areas of the article);

Example of structured abstract for the experiment type paper:

Introduction

The introduction will only contain strict and pertinent references (pro and cons) on the studies that have as a common subject the object of the research.

The research hypotheses

The hypotheses of the paper must be clear and concise.

Research methods and procedures

Subjects

The subjects involved in the experiment are described, their distribution in groups, identifying the age, the sex and other important characteristics. The experiments on human subjects are produced in accordance with the national legislation for the human protection and the Helsinki Declaration of 1975, revised in 2004. The names and the surnames of the subjects are not used, especially in the illustrative materials.

The work methods are identified, the apparatus on which the experiment takes place (presenting the name of the producer and the address between parentheses) and the statistic methods in detail. The new or considerably modified methods are described, motivating their choice and evaluating their limits.

Statistical analysis

The statistical methods are described with sufficient details, in order to understand and to check the results obtained. The names of the computer programs used for the statistical processing of the data are specified.

Results

The results are presented in a logical sequence, through tables and diagrams. The results expressed through text should not be found in the tables and/or diagrams and the other way around.

Tables

The tables cannot be introduced in the text as photographs. The tables must be numbered in the upper part, in succession in the order of the first text quoting, followed by a conclusive and succinct title.

Table 1. Physical characteristics of the subjects

Variables	Feminine subjects (n=21)	
	M±DS	CV (%)
Body height (cm)	166,143±5,597	3,369
Body weight (kg)	61,524±8,364	13,595
IMC (kg/m ²)	22,338±3,282	14,692
Body fat percentage (%)	25,329±3,074	12,136
Fat mass (kg)	15,182±4,066	25,715

* significant correlated with IMC, r=0,875.

Established significance level at p<0,05.

IMC, body mass index; M, average; DS, standard deviation; CV, variability coefficient; n, number of subjects.

Tabelul 1. Caracteristicile fizice ale subiecților

Variabile	Subiecți de sex feminin (n = 21)	
	M ± DS	CV(%)
Înălțimea corporală (cm.)	166,143 ± 5,597	3,369
Greutatea corporală (kg.)	61,524 ± 8,364 *	13,595
IMC (kg/m ²)	22,338 ± 3,282	14,692
Procent de grăsime corporală (%)	25,329 ± 3,074	12,136
Masa grasă (kg.)	15,812 ± 4,066	25,715

* semnificativ corelat cu IMC, $r=0,875$.

Prag de semnificație stabilit la $p<0,05$.

IMC, indicele de masă corporală; M, media; DS, deviația standard; CV, coeficient de variabilitate; n, numărul de subiecți.

In the lower part of the table the following symbols will be used, in order to emphasize the differences or the significant correlations statistically, in the following order: *, †, ‡, §, □, ¶, **, ††, ‡‡, etc. Also in the lower part of the tables the significance level established by the researcher will be presented and the unusual abbreviations used in the table will be explained.

Each table must be quoted in the text. The tables from other publications must be used with the permission of the author (authors), indicating the bibliographical source from where it was assumed.

Diagrams (illustrations)

The diagrams must be numbered in the lower part, in succession in the order of the first text quoting, followed by a conclusive and succinct title, preceded by the unusual abbreviations used in the diagram or other observations.

Measurement units

Measuring the length, height, weight and volume must be expressed in metric units (meter-m, kilogram- kg, liter- l, second- s, or decimal multiples). The temperature must be measured in Celsius grades (°C), and the arterial pressure in mmHg. Other measurement units must be expressed in the International Units System (SI).

Discussions

In the chapter Discussions the new and important aspects are emphasized, which result from the data processing. The data of other similar studies presented in the introduction chapter cannot repeat in detail. Also, the implications of the results found must be discussed, their limitations and the implications of these results, for the future studies. The observations found must be reported to other similar studies.

Conclusions

The conclusions must be reported directly to the hypotheses of the paper and derive directly from the chapter Discussions. The conclusions that are not fully backed-up by the data found or that are based on unjustified affirmations must be avoided. New hypotheses can be concluded or attach some recommendations, if the case be.

Thanks

In the section Thanks (when the case appears) there can appear:

- the contribution of the people that are not co-authors;
- the name and surname of the people that have contributed intellectually to the accomplishment of the paper (with their agreement), but that are not co-authors- scientific counselor, data collector etc.;
- the financial help and the material support, specifying the nature of the support;
- the technical help (in a separate paragraph called "Other contributions");

Bibliography

Bibliography and text quoting

The bibliography must be arranged in alphabetical order, the unpublished papers being quoted, but that are registered for publishing. In the bibliography all the authors quoted in the text are written. In the text all the authors are written if there are 6 or less. If there are 7 or more authors, the first three authors are written, followed by "et al." (it comes from the latin "et alia" which means "and others"). If in the bibliography there are at least 2 papers that have an identical author (authors) and the publishing year, in the text, but in the bibliography as well, immediately after the publishing year, a letter will be written (in alphabetical order), in order to distinguish the papers in the bibliography ((1998a), (1998b)). The name of the author (authors) must be followed by the initials of the surname.

In the text, the quotations will have the following structure:

- a) for one and/or two authors
 - at the end of the phrase (T.S. Keller, and A.L. Roy, 2002);
 - in the phrase T.S. Keller and A.L. Roy (2002), T.T. Gomez, 2003 found significant differences of isometric force...
- b) up to (including) 6 authors
 - at the end of the phrase (T.S. Keller, A.L. Roy, Carpenter G, 2002)
 - in the phrase "Also, (S. Keller, A.L. Roy, G. Carpenter, 2002) found significant differences of isometric force..."
- c) more than 6 authors
 - at the end of the phrase (T.S. Keller, A.L. Roy, G. Carpenter et al, 2002);

- in the phrase “Also, T.S. Keller, A.L. Roy, G. Carpenter et al (2002) found significant differences of isometric force...”

Generally, for magazines, the bibliography will have the following structure:

Name of the author- authors (year of publication), Title of the article, Magazine, number of the volume (yearly number the number of the supplement part): number of pages.

- a) standard magazine article
- b) organization as an author
- c) no author
- d) volume with a supplement
- e) number with supplement
- f) volume with part
- g) number with part
- h) number without volume
- i) no volume and number
- j) pages in roman numbers
- k) indicating the type of article if it is necessary

For **books** the bibliography will have the following structure:

- a) personal author(s)
- b) editor(s) as author(s)
- c) organization as author or the one that publishes
- d) chapter in a book
- e) license degree paper, dissertation or PhD. Thesis.

RISTARU, M., 2005, *The influence of pliomtry on the muscular development at the lower limbs level* [dissertation]. Constanta, The Faculty of Physical Education and Sport.

For **unpublished materials (but in the course of publication)**, the bibliography will have the following structure:

For the **electronic materials**, the bibliography will have the following structure:

- a) article in electronic format
- b) computer program

Sending the manuscripts in electronic format

For the review of a research paper or a better organization of the research papers volume by the scientific board, the author (authors) will have to send a copy in electronic format (ASCII) in the format Word Microsoft Office. The papers in Romanian will be written with diacritical signs in the format Romanian (Legacy) of the computer keyboard. Also, the operating system used (Microsoft Windows XP, Microsoft Vista) and the processing program of the text (Microsoft Office XP, Microsoft Office 2003, Microsoft Office 2007) will be mentioned.

The evaluating/self-evaluating grid for the quality of the research paper by the reviewer/author(s)

The evaluating/self-evaluating grid for the quality of the research paper by the reviewer/author(s)

1	The originality of the research theme	15 points
2	The quality of the research paper structure	5 points
3	The clarity and quality of the research hypotheses elaboration	10 points
4	The quality of the registration of the results and their presentation	10 points
5	The clarity and quality of the discussions directly linked to the results with reference to similar studies	10 points
6	The clarity and quality of the elaboration of the conclusions in accordance with the hypotheses of the paper	10 points
7	The applicability of the results found in the practical and scientific practice	10 points
8	The accuracy of the in text and bibliography quoting	10 points
9	The clarity and quality of the expression in the text	10 points
10	Strictly respecting the elaboration technical requirements	5 points

Total 100 points

Based on these reasons, the article will receive from the reviewers' board a number of points. A number lower than 60 will lead to the rejection of the article, between 60 and 90 points the article will suffer certain changes from the point of view of the structure, expression in the text, etc. in order to receive the accept for publication, and over 90 points the article will receive the accept for publication, after small changes in the elaboration (if the case may be).

The review of the article will be objective, clear and strictly formulated, in accordance with the **technical and scientific request for the elaboration of the scientific papers**, without discrediting the author(s) of the article (manuscript).

The review process

Step 1

The article must be send in electronic format (or on any media format CD_ROM, etc), in Romanian (Abstract in Romanian and English), through electronic mail at the address contact@analefefts.ro, cecilia_gevat@yahoo.com (Professor PhD Cecilia Gevat), crispopa2002@yahoo.com (Lecturer PhD Popa Cristian), or at the mailing address Aleea Universitatii, Baza Nautica, Constanta, Romania, Tel./ Fax. +40 241 640 443.

Step 2

The article deposited for publishing must be accompanied by a short personal presentation and a professional CV, no more than 120 words, that must contain the detailed contact address, including phone number, fax number (if it exists) and the e-mail.

Step 3

At least two members of the Editorial Collective and of the Scientific Board will initially analyze the article and will nominate at least two reviewers to analyze the article in detail.

Step 4

The article will be officially analyzed by at least two reviewers with expertise in the thematics of the article deposited for publication. The article will receive a number of points from the reviewers' board.

Step 5

The articles that follow (over 90 points) the scientific and technical standards for elaboration will be included into the waiting list for publication. The articles that need certain modifications (between 60 and 90 points) will be returned with the reviewers' observations, for their modification by the author(s). The articles that do not accomplish the minimum scientific and technical requests for elaboration (60 points) will be rejected by the reviewers' board.

Step 6

The articles will be included on the waiting (approval) list for publication.

Step 7

After the approval, the article will be published in the magazine, and the author(s) will receive a free copy of the magazine.

Deadlines for handing in the articles

Two numbers of the magazine will be published per year and a supplement for number 2 of the magazine in that year.

The deadline for handing in the articles for the first number of the magazine is 6th January, for the second number of the magazine is 15th April, and for the supplement of the magazine is 30th September. Based on the number of articles handed in, the Editorial Collective and the Scientific Board will be able to postpone the publishing of an article in a future number of the magazine.

Publishing tax

The publishing tax will be **100 RON and for students 50 RON (Romanian money (lei))**.