Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

❖ SPORT AND PERFORMANCE

STUDY REGARDING THE DYNAMICS OF AFFECTIVE MANIFESTATIONS IN MIDDLE DISTANCE AND LONG DISTANCE RUNNERS, IN DIFFERENT SITUATIONS OF MENTAL STRESS

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Abstract

Introduction. High performance in track and field is constantly conditioned by the athletes' reaction to different stress factors. The analysis of mental stress on athletes in different situations has made certain specialists to say that the psychological effect of a stress agent (seen as a response of the athlete) is less predictable than the physiological effect, one reason being the complex and difficult nature of objectively predicting the response provoked by the effect of the stress factor, considering the fact that high performance athletes react differently to the pressure of complex situations during training and competitions.

Methodology. The research was conducted on 12 subjects with different experience in high performance track and field/athletics, and in this specific event. The subjects were given three psychological tests, within a period of six months, during three different stress situations: two tests (initial and final) before two major competitions (the national championships - selection competitions), and an intermediate testing (halfway between the two competitions, when the subjects were in full training process for the second competition). During these six months the previously planned training program was followed, but with a larger emphasis (in comparison with other training periods) on the psychological training of the athletes.

Results. The statistical analysis of the values for the studied variables has shown the existence of significant differences only in the manifestations associated with certain psychological states of the ones we studied, during different tests.

Conclusions The affective manifestations of the middle distance-long distance runners during different situations of mental stress present an oscillatory dynamics with a slightly descendant curve, showing a complexity of the psycho-affective states and reactions.

Key words: mental stress, emotional manifestations, track and field, middle-long distance running.

Introduction

The body's reactions generated by stress factors, but also the stress regarded as a reaction of the body, are permanently accompanied by modifications in the complex states, characterized by a high level of affectivity, which can involve an excess of emotional responses (psychological component). In the professional, high performance athletic activity, due to its intensity and specific nature, the affective responses are expressed more than visibly in the athletes' behavior, in their language, in their general and specific psycho-motor activity.

Various studies and researches tried to suggest, throughout time, a large series of strategies for determining and controlling the different affective states (D.M.McNair, et al. 1971, S.L.Gordon, 1981, R.S. Lazarus, S.Folkman, 1984, G.Mandler, 1984, H.R.Beech, 1989, R.E.Thayer, 1989, 1996, P.R.E.Crocker, 1992, J.Cosnier, 1994, M.Miclea, 1997, V.Grigore, G.Mitrache, 2008), especially for the athletic high performance activities, where the manifestation of the psycho-affective reactions surpasses the "normal" (J.E.Kane, 1966, B.J.Cratty, Y.L.Hanin, 1980, R.Martens, 1987, 2004, R.Martens, S.Vealey, D.Burton, 1990, L.Hardy, J.Graham, D.Gould, 1996, E. Thill, P.Fleurance, 1998, Y.L.Hanin, 1999, M.J.Stevens, M.A.Lane, 2001, R.S.Weinberg, D.Gould, 2007, G.Tenenbaum, 2007, F.Warburton, M.Pia, 2010).

The dynamics of the affective manifestations, especially in professional high performance athletes, is influenced by different factors (biological, psychological, social, environmental, etc.). The body's resistance to the stress-inducing action, as well as the

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Received 11.05.2012 / Accepted 12.08.2012

adaptation reaction that is immediately the acting factors. However, according to some authors (M.Cosma, 2000), we cannot ignore the fact that in optimal conditions of emotional balance, the reactions cannot be inadequate to the stimuli, maladapted in the situations in which the emotional endurance capacity is overcome by the intensity of the demands, by the violence of emotional traumas, of by the prolonging and influence over time.

Previous research in the field of professional sports highlighted the fact that stress is directly influenced by the level of the psycho-affective states before a competition period. This level is increased more if the importance of the competition is higher, manifesting itself through the development of negative emotions, feelings of apprehension and tension, associated with a high activation level of the body.

In different stress conditions, in the case of professional athletes, the perception of the result's incertitude, as an inherent factor, is tied to the subjective probability of success, meaning to the chances that the subject grants himself for achieving the desired result (D.Delignieres, 1993, 2008), a fact that can determine an increase in the psychological tension, with more or less obvious repercussions on the individual's emotional state.

For this research, we focused on highlighting the aspects regarding the dynamics of certain affective manifestations in specific, but different, competition stress conditions, in middle distance and long distance runners.

We specify that the research was conducted through a specific psychological training program, over the course of 6 months.

Research Methodology

Research hypothesis

Certain affective manifestations determined by the various mental stress situations in the middle distance and long distance runners can present a slightly oscillating dynamics, but with a decreasing tendency when the mental stress-generating situations are modeled within a specific psychological training program.

The *subjects* of this research were 12 professional middle distance and long distance runners (8 male and 4 female) (Table 1), from 5 Romanian sports clubs, with an average age, at the beginning of the experiment, of 22 (minimum 18, maximum 28), with an experience in track and field between 5 and 14 years, and a specialization in the middle distance and long distance events of minimum 4 years. The subjects' athletic performances are from good (nationally medaled) to very good (multiple national and Balkan champions, medaled in various editions of the European Cup, participants, and some of them , even finalists in World and European championships for juniors and youth).

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The research instrument we used was an adapted form of the P.O.M.S. test (the Profile of Mood States, as described by McNair, 1971). This test was applied as a questionnaire. Based on indications, the obtained scores were transfered on a specific test profile chart, comprising T-scores for each factor. The graphical representation of the data shows "iceberg"-type diagrams, with the visible side being delimited by a line found at the 50 point mark. The variables subjected to the POMS analysis usually are: tension-anxiety, depression-dejection, anger-hostility, vigor-activity, fatigue-inertia, and confusion-bewilderment.

For this paper, we focused on three of the six psycho-affective states:

- *tension-anxiety (T-A)* - a variable highlighted by adjectives describing a high somatic tension ("tension," "on the edge"), as well as observable psycho-motor manifestations ("weak," "restless"). The adjectives referring to an anxiety and diffuse state are: anxious, embarrassed;
- *depression-dejection (D-D)* - represents a depressive mood, accompanied by a feeling of inadequacy, being described by scales that indicate feelings referring to a lack of personal value, uselessness when trying to adapt ("unworthy," "hopeless," "desperate"), a feeling of emotional isolation from others (sad, lonely, helpless, miserable), sadness (sad, unhappy), and guilt (guilty about something done);
- *fatigue-inertia (F-I)* - a variable that highlights a state of tiredness, inertia, and a low level of energy;

In order to determine the dynamics of the affective manifestations in various mental stress conditions, we applied the tests in 3 moments of maximum importance for the high performance activity of the subjects. As the level of psychological manifestations is higher during athletic competitions, the tests envisaged 3 major competitions, in different moments in time during the competition season, with different meaning for each subject. The tests we conducted as follows:

- the initial testing (February 2011, National Senior Championship, indoor, main objective - medal);
- the intermediary testing (June 2011, International Championship, outdoor, mai objective - time);
- the final testing (August 2011, National Senior Championship, outdoor, main objective - medal);

The determination of the psycho-affective moods appearing before the athletic competitions was done in the first day for each of the three competitions, in the morning, after the athletes woke up and served

breakfast, the testing being supervised by a psychologist.

The utilized means system

We applied 30 means destined for a specific psychological training, in 48 lessons, throughout 24 weeks (6 months). The specificity of the lessons was adapted, mainly to regulate the dispositions generated by the 6 variables evaluated through the POMS test.

We must mention that the athletes' training before the three envisaged competitions (the final 6 days before entering the competition) did not include any more high levels of intensity or volume, the runners performing standard training sessions, specific to the week before the competition. These training sessions have subjected no longer the body to new adaptations or stimuli, having as main goals: the active rest, maintaining the obtained energy to an optimal level, the psychological and tactical preparation for the competition.

In order to have a point of reference as objective as possible for comparing the subjects' behavior during the three moments of testing, we transformed the obtained performances into points, in compliance to the IAAF regulations, and we did an analysis of the correlations between the affective manifestations and the recorded performances.

The statistical-mathematical analysis imposed the use, among others, of the following operations: calculation of the arithmetical mean, calculation of the standard deviation, determination of the variability coefficient, of percentages, of the significance threshold, of the confidence interval (Student's **t**-test), and of the Pearson's **r** correlations.

Results

The existence of differences that were statistically significant between the three moments of testing, has allowed us to observe the following:

- the obvious and continuous decrease of the variable T-A values (Tables 2 and 3), form one test to the other, highlights the positive influence the psychological training program for the regulation of competition stress had on the subjects. Thus, at the end of our research, we can say that the middle distance and long distance runners can manifest diminished states of somatic tension and anxiety (Figure 1), being able, through psychological training, to control certain reactions determined by various stress-inducing situations (such as a competition);
- if during the intermediary testing (T2) we could observe a significant increase in the mental fatigue and a decrease in the energy level (variable F-I, from 47.33 to 53.00 points, due also to the fact that the subjects were at T2 time at the end of their training period, when the workload reached its maximum peak), during the final testing, the values return under the 50 points threshold, which is considered a point of reference by the POMS test (average values of 48.42 points). After comparing the initial and the final values, we can see that the subjects have developed the ability to control and regulate their level of mental fatigue, generated by the effects of competition stress;
- regarding the variable D-D, we can observe an oscillatory evolution (Table 3), with a slight increase from the initial testing (T1) to the intermediary testing (T2), so that afterwards to be found a decrease of average values from the intermediary to the final testing (T3). However, as the average values are under the reference point (50) imposed by the POMS test, we can say that the depressive moods, accompanied by a feeling of inadequacy, of feelings referring to a lack of personal value, uselessness when trying to adapt ("unworthy," "hopeless," "desperate"), a feeling of emotional isolation from others (sad, lonely, helpless, miserable), sadness (sad, unhappy), and guilt (guilty about something done), do not significantly modify their intensity in the middle distance and long distance runners. In other words, the affective manifestations determined by various athletic competition events, mental stress-generating, do not record significant values for the practice of professional middle distance and long distance running.

The comparison of the psycho-affective moods profile (POMS) for the three tests and the data recorded in the final testing, after applying the special psychological training program, allowed us to observe the following:

- visible decreases (Table 4) in most of the analyzed variables, and especially from T2 to T3, and from T1 to T3;
- the largest decrease in the affective manifestations can be found in the tension-anxiety variable (T-A), where we can clearly see a tendency of constant decrease of the average value with more than 2.5 points of the profile chart (Table 4). After analyzing the dynamics of the average values calculated statistically-mathematically, we can say that the application of a specific psychological training can determine a decreasing evolution (involution) of the affective dispositions that are characterized by a high somatic tension ("tension," "on the edge"), as well as observable psycho-motor manifestations (anxious, restless, embarrassed);
- the smallest decrease can be observed for the variable D-D (Table 4), but as the compared values (T1 and T3) are below the 50 points limit, we can say that the moods that are characteristic to depression and low level of self-esteem cannot be usually found in middle distance and long distance runners;
- we observed a small increase towards the end of our research for the variable F-I (1.09 points), but this has a real justification, taken from the practice of sports: as the final important competition was placed in August 2011, 6 months after the beginning of a new training stage, and as up to that date the athletes had been participating in many athletic competitions, the slight increase in the mental fatigue at the end of the competition season, is normal, in our opinion.

The comparative analysis in a chart of the subjects' profiles during the three tests (Figure 4) suggests a clear modification of the psycho-affective dispositions, from one mental stress state to another. We observed:

- a decreasing dynamics regarding tension-anxiety (T-A), being very close to the reference point (50), under which the observable psycho-affective phenomena are considered to no longer represent manifestations generated by mental stress;
- a preservation, and afterwards a decreasing dynamics of depression-dejection (D-D), although in this case we cannot speak of significant affective manifestations in the subjects, given the average values under 50;
- a slightly increasing dynamics of mental fatigue, due, in our opinion, to accumulation of fatigue generated after a long season of training and competitions. The 1.09 increase of the average values from the initial testing (T1, competition stress factor during indoor season) to the final testing (T3, mental stress factor during outdoor season) is insignificant, the comparative statistical analysis done through the Student's t-test (with a significance threshold of $p < 0.05$) being conclusive.

The qualitative analysis of the statistical correlations regarding the sense of average values modifications for the psychological variables throughout the duration of this research, has emphasized the following aspects:

- *the variable T-A*, although initially did not correlate with the points scored in the track and field event (being close to zero), after the intervention program it correlated negatively (Table 5) with the points recorded during the third competition (August 2011). As the variable T-A evaluates psycho-affective states that are characterized by somatic tension, anxiety, being a negative dimension, according to the sports psychology descriptions, we can estimate that as the subjects tend to have lower T scores for this variable, they will tend to have better performances during their track and field competitions. Practically, a descending dynamics of the affective manifestations values can determine an ascending dynamics of athletic performances in professional middle distance and long distance runners;
- *the variable D-D* correlates negatively and relatively the same with the points obtained by transforming the athletic performances recorded by the subjects during the February 2011 competition (before our intervention), and during the August 2011 competition (after finishing the intervention program - Table 5). We could estimate that the intervention program did not have any effect on the link between D-D and the subjects' athletic performances. This is a normal aspect, as our program did not focus on regulating this variable, D-D not recording high enough values to attract our attention;
- *the variable F-I* correlated negatively and weak with the points obtained during the February 2011 competition (before the intervention), but throughout the psychological training period and at its end, the correlation tends toward zero (null, Table 4). This aspect allowed us to think that the psychological training program we applied had an effect of weakening the link between F-I and athletic results, the subjects (professional athletes) managing to control their fatigue-inertia levels during the competitions in which they were directly involved.

Discussions and Conclusions

Our hypothesis, stating that "certain affective manifestations determined by the various mental stress situations in the middle distance and long distance runners can present a slightly oscillating dynamics, but with a decreasing tendency when the mental stress-generating situations are modeled within a specific psychological training program" was confirmed, as the data presented in the paper proves it.

Maintaining within normal limits, throughout a specific competition period, through a specially adapted psychological training program, the psycho-affective manifestations, characterized by depressive states (variable D-D), at the same time decreasing significantly the negative influences of the psychological and somatic tension states, anxiety (T-A), and confusion in thought before the important competitions, can constitute an useful way when the goal is obtaining high athletic performances in the middle distance and long distance events.

The selection of original methods for developing the ability to control the psycho-affective dispositions that are specific to a crisis situation (as is the one provoked by mental stress), as well as their adapted application in training, can create an improvement of the professional athletes' abilities before an important competition, when trying to control or regulate the negative psychological tensions, and the psychological fatigue which is unavoidable before competitions.

Form the point of view of the affective manifestations determined by the athletes' reactions to stress, we can say that, although a good part of the affective manifestations caused by the mental stress during competitions are present also in other sports branches, the specificity of physical and psychological demands during the professional high performance track and field activity determines reactions to stress with intensities and values that are different from the ones recorded in athletes practicing other sports. This aspect determines, in our opinion, the middle distance and long distance runners to live their psycho-affective moods at a different intensity.

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Table 1 - The subjects - identification data

No.	Subject	Age	Experience in track and field	The event the athlete is specialized in	Experience in that event
Subjects - Men's					
1.	G.I.	23	9 years	3000m hrdl.	6 years
2.	S.A.	20	5 years	5000 m, 10.000m	4 years
3.	I.C.	26	11 years	5000 m, 10.000m	8 years
4.	C.V.	20	7 years	800m	5 years
5.	P.G.	21	8 years	800m, 1.500m	7 years
6.	G.A.	23	11 years	3000m hrdl.	8 years
7.	Z.I.	28	17 years	800m, 1.500m	12 years
8.	M.I.	19	8 years	800m, 1.500m	4 years

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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Subjects - Women's					
9.	F.C.	23	9 years	5000m, 10.000m	4 years
10.	B.C.	19	6 years	800m, 1.500m	4 years
11.	B.A.	24	14 years	1500m, 3000hrdl.	8 years
12.	C.I.	18	5 years	800m, 1.500m	4 years

Table 2 - Data recorded by the subjects

No.	Initials	gender	age	T-A			M	D-D			M	F-I			M
				t1	t2	t3		t1	t2	t3		t1	t2	t3	
				S	S	S		S	S	S		S	S	S	
1.	G.I.	M	23	47	54	48	49.67	42	41	49	44.00	40	41	40	40.33
2.	S.A.	M	20	63	58	62	61.00	48	47	49	48.00	54	45	48	49.00
3.	I.C.	M	26	51	49	51	50.33	41	44	40	41.67	45	52	48	48.33
4.	C. V.	M	20	55	54	52	53.67	39	39	48	42.00	41	54	49	48.00
5.	P.G.	M	21	65	61	60	62.00	50	60	58	56.00	55	51	57	54.33
6.	G. A.	M	23	63	60	45	56.00	46	48	39	44.33	49	57	45	50.33
7.	Z.I.	M	28	55	47	51	51.00	59	59	48	55.33	52	60	37	49.67
8.	M.I.	M	19	57	52	50	53.00	55	53	53	53.67	51	63	52	55.33
9.	F.C.	F	23	52	51	48	50.33	44	42	43	43.00	41	52	45	46.00
10.	B.C.	F	19	55	55	51	53.67	45	45	41	43.67	40	55	43	46.00
11.	B. A.	F	24	55	51	43	49.67	40	40	37	39.00	43	49	51	47.67
12.	C.I.	F	18	63	58	54	58.33	55	56	53	54.67	57	57	66	60.00
Average			22	56.75	54.17	51.25	54.06	47	47.83	46.5	47.11	47.3	53.0	48.4	49.58
	Max		28	65	61	62		59	60	58		57	63	66	
	Min		18	47	47	43		39	39	37		40	41	37	
	ampl		10	18	14	19		20	21	21		17	22	29	
	S		3.05	5.63	4.41	5.48		6.54	7.44	6.50		6.37	6.15	7.73	
	Cv		13.84	9.91	8.14	10.69		13.91	15.56	13.98		13.46	11.60	15.9	

Table 3.
The T test of comparing the averages between the the three tests, in the case of the 3 studied psychological variables

POMS	Averages T1-T2	T Test T1 – T2	Averages T2-T3	T Test T2 – T3	Averages T1-T3	T Test T1 – T3
T-A	56.75	t (11) =	54.17	t (11) =	56.75	t (11) =

	54.17	2.385, p = 0.036	51.25	2.338, p = 0.042	51.25	3.538, p = 0.005
D-D	47.00	t (11) = 0.890, p = 0.392	47.83	t (11) = 0.781, p = 0.451	47.00	t (11) = 0.288, p = 0.778
	47.83		46.50		46.50	
O-I	47.33	t (11) = 2.693, p = 0.021	53.00	t (11) = 1.749, p = 0.108	47.33	t (11) = 0.551, p = 0.593
	53.00		48.42		48.42	

Table 4 - Comparative analysis of the T scores in the three tests

Average of the T Scores			
Testing	**T-A**	**D-D**	**F-I**
Initial testing (T1)	56.75	47.00	47.33
Intermediary testing (T2)	54.17	47.83	53.00
Final testing (T3)	51.25	46.50	48.42
Difference T2 – T1	**- 2.58**	**+ 0,83**	**+ 5,67**
Difference T3 – T2	**- 2.92**	**- 1.33**	**- 4.58**
Difference T3 – T1	**-5.5**	**-0.50**	**+1.09**

Table 5 - The Pearson r correlation coefficients between the values of the psychological variables and the values from the students' points recorded during the analyzed track and field competitions

Variable	**Score 1 (N = 12)**	**Score 2 (N = 12)**	**Score 3 (N = 12)**
T_A1	r = 0.057, p = 0.861		
T_A2		r = 0.358, p = 0.253	
T_A3			r = – 0.215, p = 0.503
D_D1	r = – 0.192, p = 0.550		
D_D2		r = – 0.002, p = 0.996	
D_D3			r = – 0.208, p = 0.517
F_I1	r = – 0.140, p = 0.664		
F_I2		r = – 0.042, p = 0.896	
F_I3			r = – 0.054, p = 0.869

T_A1 – the variable tension – anxiety during test T1, T_A2 – the variable tension – anxiety during test T2, T_A3 – the variable tension – anxiety during test T3, etc.

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
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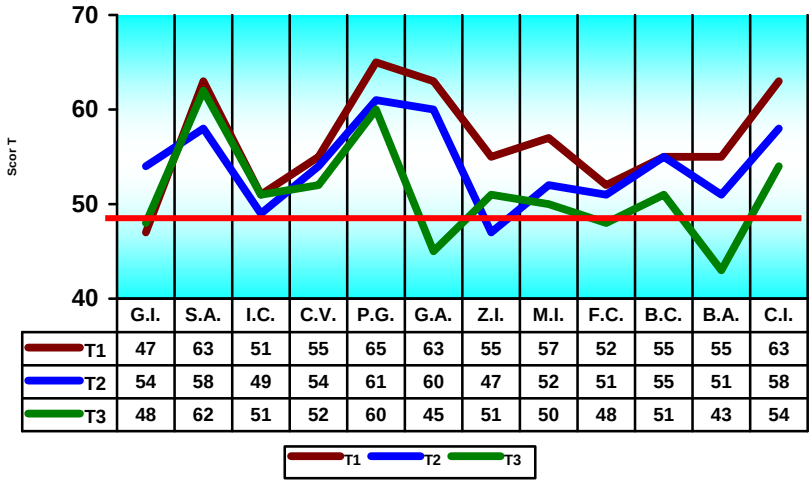
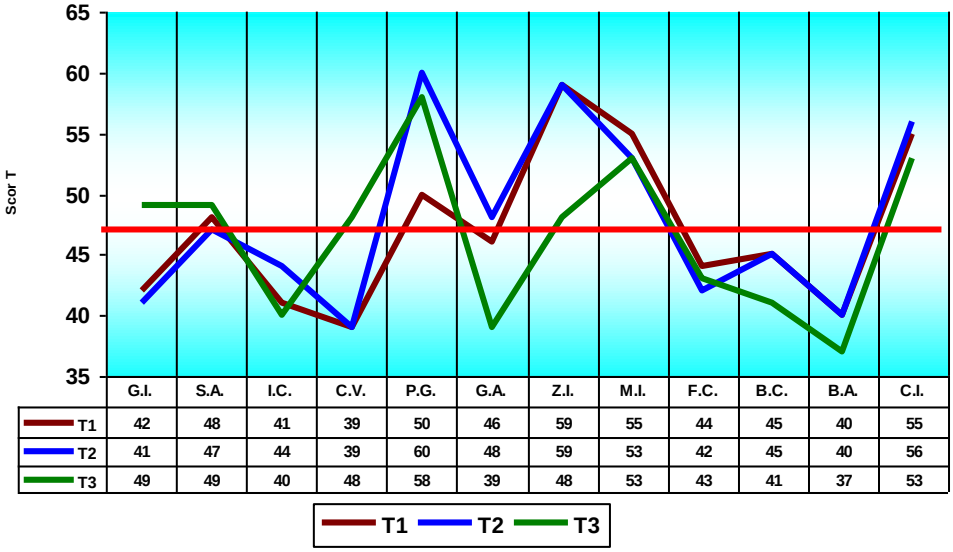


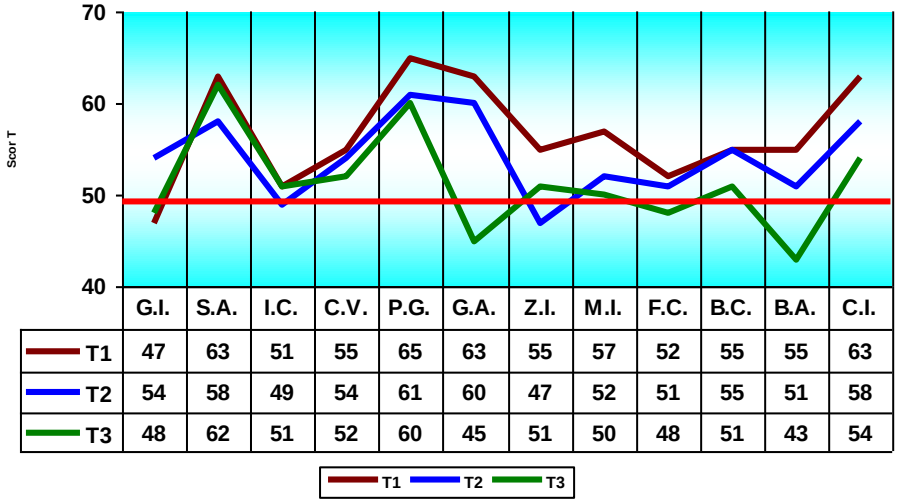
	G.I.	S.A.	I.C.	C.V.	P.G.	G.A.	Z.I.	M.I.	F.C.	B.C.	B.A.	C.I.
T1	47	63	51	55	65	63	55	57	52	55	55	63
T2	54	58	49	54	61	60	47	52	51	55	51	58
T3	48	62	51	52	60	45	51	50	48	51	43	54

Figure 1 - Evolution of the values for the ***variable T-A***, in the three moments of the testing (initial test - T1, intermediary test - T2, final test - T3)



	G.I.	S.A.	I.C.	C.V.	P.G.	G.A.	Z.I.	M.I.	F.C.	B.C.	B.A.	C.I.
T1	42	48	41	39	50	46	59	55	44	45	40	55
T2	41	47	44	39	60	48	59	53	42	45	40	56
T3	49	49	40	48	58	39	48	53	43	41	37	53

Figure 2 - Evolution of the values for the ***variable D-D***, in the three moments of the testing (initial test - T1, intermediary test - T2, final test - T3)



	G.I.	S.A.	I.C.	C.V.	P.G.	G.A.	Z.I.	M.I.	F.C.	B.C.	B.A.	C.I.
T1	47	63	51	55	65	63	55	57	52	55	55	63
T2	54	58	49	54	61	60	47	52	51	55	51	58
T3	48	62	51	52	60	45	51	50	48	51	43	54

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Figure 3 - Evolution of the values for the ***variable F-I***, in the three moments of the testing (initial test - T1, intermediary test - T2, final test - T3)

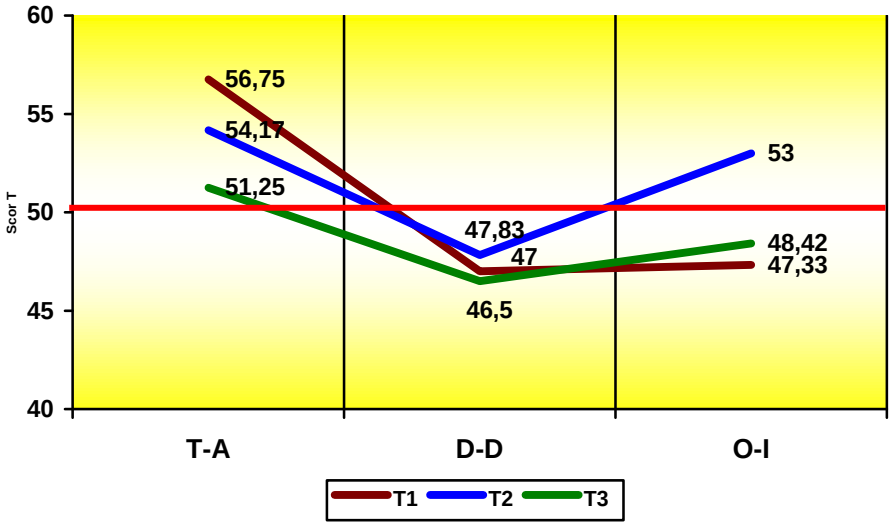

Figure 4 - Comparative analysis regarding the profile of the psycho-affective dispositions in all three tests

COMPARATIVE ANALYSIS OF ALBANIAN FEMALE VOLEYBALL PLAYERS WITH ANTHROPOMETRIC, PERFORMANCE AND HEMATOLOGICAL PARAMETERS

BOZO DHURATA[1], LLESHI ENKELEIDA[1]

Abstract

Purpose. Profile and compare, female volleyball players with anthropometric characteristics, performance indicators and haematological parameters.

Methods. 24 subjects of two volleyball teams, from elite and university, were assesses for 5 anthropometric characteristics, 6 performance tests and 10 hematological markers.

Results and Discussion Elite players display better values for physical, body composition and generic jump parameters, but lower specific performance abilities than counterpart college players. Blood markers revealed normal mean team values while the RBC shows low or tendent to low values for 5 out of 11 parameters, which call for special attention to anemia problems as well.

Conclusion. The results could be used to identify eventual health or performance related problems, help and guide coaches for professional evaluation, selection, as well as for planning of the most appropriate traning programs to better fit the players and the team as a whole.

Key words. Albanian volleyball, performance indicators, haematological profiling.

Introduction

Anthropometric characteristics and morphological parameters, in combination with the physiological and biochemical tests are becoming more and more subject of diverse studies in the field of sports especially in the last two decades (U. Hartmann, J. Mester, 2000; G. Cometti, D. Cometti, 2009). They can be used on one side, to assess the physical growth and nutritional status of sport exercisers and on the other hand as a reliable individual specific profile for the prediction and improvement of the physical performance. An appropriate and wise approach and use of these indicators and tests both in quantitavive and qualitative terms, a reliable interpretation and integration of the relative values alone or in combination, can be utilized to project the performance level of the elite sportpersons. The ongoing monitoring of such parameters, the identification of eventual health and/or perfomative problems, can help not only for the healthy maintainance of the sportpersons, but at the same time for planning and undertaking of the proper measures for the continuos improvement of the physical fitness, performance and physiological profile both at individual and group/team level. (A. Claenssens, J. Lefevre, G. Beunen, R.M. Malina, 1999).

While individuals in general respond and adapt to different exercise levels and types in different and through various biological, biochemical and physiological mechanisms, exercise and sport training and level seem to be among the most important factors that influence such responses (S. Fleck, et al., 1985).

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Received 15.05.2012 / Accepted 18.08.2012

Physical acitivity and sport induces stress on the body and influences not only modifications in physical and physiological parameters, but brings about a number of blood cells alterations and related blood parameters as well (C. Petibois, G. Cazorla, G. Deleris, 2003). From their side, alterations of haematological parameters can influence differently the physical and sport performance in different types of sport (F.D. Descorges, M. Testa, C. Petibois, 2008). The type and dynamics of the response patterns indicates the appropriateness of the exercising and training to different individuals,. The biochemical indicators alterations are quicker than the physical changes, showing this way, a strong correlation with the overall health status, the physical and sport performance; being so, they can be used to rapidly check and follow eventual health problems or adverse training response, that can arise or experience different sportpersons particularly during nonpersonalized and unapproppriate training programs. (M. Withold, 1996, G. Lombardi, et al., 2011).

Recent contextual studies performed in the sport of volleyball show that, a number of anthropometric and physical characteristics (such as Body Height, Body Weight, %Body Fat,) and specific physical-performance parameters seem to be advantageous to the volleyball players and positively correlated with higher performance (K. Shyamal, J. Singh, J.S. Sandhu, 2010). But despite the popularity of this sport worldwide, there are gaps or poor data on players profiles, particularly related to adolescent and young female competitors of different ages (M.J. Duncan, L. Woodfield, Y. Al-Nakeeb, 2006).

It is also known, that young-aged sport females go against rapid and visible physical, physiological and hormonal changes and these factors higly influence their sport performance along this quick developing period, becoming at the same time causes for health problems such as anemia and other abnormalities (N. Tsunawake, Y. Tahara, K. Moji, S. Muraki, K. Minowa, V. Yukawa, 2003, D.P. Ferris et al, 1995).

In the above context, the aim of the present study was to profile and compare, on a set of basic anthropometric characteristics, specific volleyball performance indicators and a number of haematological parameters, young elite female volleyball players (Albanian Youth National Team 2011) with college counterparts in Albania.

Worth to mention, that for Albania, this is a pioneer study where physical, performance tests and blood markers and comparisons within age-groups become part of an integrative and profiling study in young female volleyball players.

Methods

The participants in this study were 24 subjects in total: 12 female volleyball players of the Youth National Volleyball Team 2011 and 12 from an university team ("M. Barleti" University of Tirana). The age range of the elite players was from 17 to 19 years and of the university team from 17-21 years old. The 24 females, subjects of this study, were assessed for 5 anthropometric parameters, 6 specific performance tests and 10 blood markers (M.J. Duncan et al, 2006; T. Gabbett et al. 2007).

The assessed anthropometric variables were: Body Height (BH), Body Weight (BW), the Body Mass Index (BMI). The Percent Body Fat (%BF) and Percent Lean Body Mass (%LBM) for each subject was calculated based on the individual value of the relative BMI.

Body height was measured during inspiration with a traditional stadiometer to the nearest 0.1-0.2 cm and Body Weight was measured with a digital standing scale approximated to the nearest 100 g. The Body Mass Index (BMI) was calculated as the rate between the Body Weight value and Body Surface BW/BS, where $BS = BH^2$, or $BMI = BW/BH^2$.

For the calculation of the Percent Body Fat was used the method according to Deurenberg et al., confirmed for its reliability also from other authors (A.A. Jackson, P.R. Stanforth, J. Gagnon et al. 2002). According to the above, the formula to predict the Body Fat Percentage is calculated taking into account the current individual BMI value, age and gender (P. Deurenberg, J.A. Weststrate, J.C. Seidell, 1991). In its appropriate corrected form for adult females this formula is as the follows:

Adult Body Fat% = (1.20 x BMI) – 0.23 x age) – 5.4

The Percent Lean Body Mass was calculated as the difference from 100 of the individual relative %BF value (K. Shyamal, J. Singh, J.S. Sandhu, 2010).

6 specific volleyball performance tests were performed and assessed; one physical-performance parameter, height of the arm (HA), Jump with one hand (a specific attack volleyball test); Jump with two hands (specific block volleyball test), Squat Jump (SJ), Counter Movement Jump (CMJ), and Repetitive Jump for 15 sec (RJ15sec). Based on the last three tests data (SJ, CMJ and RJ15sec), (CMJ-SJ)x100/CMJ and RJ15sec/CMJ were calculated.

SJ is a vertical jump test starting with the knees flexed at 90 degrees, and hands resting on hips; it provides a measure of the ability of rapid casting to develop a fast explosive force. CMJ is similar to the SJ, but the athlete starts in a standing position, and squats down to the 90 degree leg bend position before immediately jumping up; it constitutes a quick measure of strength to JUMP. RJ15sec are continuous jumps with a duration of 15 seconds; this test can be used to assess the functional characteristics of athletes, being the explosive power, a determinant component for realizing their optimal performance.

(CMJ-SJ)x100/CMJ is the difference in percentage between SJ and Cmj; this index shows the untapped reserves of elastic energy from muscle athletes, is a measure of the elasticity coefficient and a

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
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capacity indicator of the energy accumulated as a result of tensile elongation of muscle that precedes muscular contraction. RJ15sec/CMJ is the ratio ratio between the average height and bounces within 15 sec: these values should be approached to 1, where, in the case of commitment in team sports preferable from 0.90 to 0.95,

Previous studies have shown that these specific parameters correlate positively with the general performance in a team and can be also related and used accordingly to the particular role of each team player (G. Cometti, et a., 1999).

The haematological profiling was performed using the following 10 generic blood markers: White Blood Cells-WBC, Lymphocyte count-Lymph, Mid Sized Cell %-Mid (Basophiles, Eosinophils and Monocytes), Granulocytes-Gran, Red Blood Cells-Rbc, Haemoglobin Concentration-Hgb, Haematocrit-Hct, Mean Corpuscular (erythrocyte) Volume-MCV, Mean Cell (erythrocyte) Hemoglobin-MCH, and Mean Cell (erythrocyte) Hemoglobin Concentration-MCHC.

Blood sampling took place under standard conditions, in the morning with an empty stomach. The blood from the cubital vein was collected in tubes containing K_3EDTA. The abovelisted variables were analysed with an Automatic cell counter (Haemoanalyzer "Mindray BC- 3000 Plus).

Anthropometric parameters and performance tests were performed indoor, in normal temperature and pressure conditions, at the premises of the National Sport Palace in Tirana. The blood was taken and analysed at the Laboratory of Sport&Exercise Biochemistry at Tirana University of Sport. The tests and analysis were performed on full consent of the participants and the relative team coaches.

Standard statistical methods (Mean and Standard Deviation) were used for the direct measures and calculated parameters. One way variance analysis for the comparison of data between the elite, local and university teams was applied. A 5% probability level was determined as statistical significance of differences calculated for each parameter.

Results

Physical and Body Composition Parameters. The values of both measured and calculated parameters regarding anthropometric and body composition data are given in Table 1 for both teams under investigation. Each indicator has been reported through the mean team value and the relative standard deviation.

Table 1: Values of anthropometric parameters and body composition of Albanian female volleyball teams

Parameters	National Youth Team		University Team	
	Mean	SD	Mean	SD
Age in years	18.25	10.5	21.2	3.4
Body Height (BH) in cm	179.8	7.73	176.1	6.32
Body Weight (BW) in kg	66.5	8.52	63.55	8.4
Body Mass Index (BMI) in kg/m^2	20.53	1.48	20.39	2.40
Body Fat (BF) in %	23.43	1.69	23.95	2.99
Body Lean Mass (BLM) in %	76.57	1.69	76.05	2.99

The comparative data for the 5 body parameters between the teams of the study are shown on the diagram of Figure 1 below.

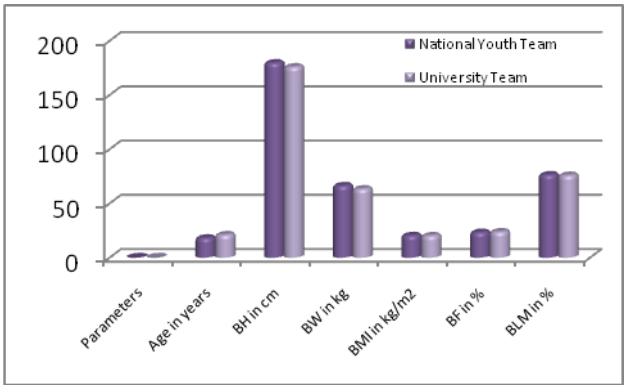

Figure 1: Comparison of Anthropometric Parameters between the National (Youth and Junior), local and university teams of Albanian female volleyball players

The volleyball players of the National Youth Team displays an insignificant higher Body Height (around 2%), higher BW (5%), higher BMI value (around 7%), but very similar BF% and BLM%. Interesting to notice the high variance and heterogeneity for the body weight values for both national and university teams.

These results can be explained based on the age and the playing and training experience of the teams, but they should be utilized anyway to drive the coaches and the players themselves for the planning and implementing of the special and specific nutritional and training programmes which better fit to the team in general and to the individuals in particular, aiming the improvement of such parameters.

Performance tests parameters. The results of the jump tests for both teams under investigation are given in Table 2 and comparatively on the diagram of Figure 2 below.

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Table 2: Values of specific volleyball jump tests of Albanian female volleyball teams

Parameters	National Youth Team		University Team	
	Mean	Standard Deviation	Mean	Standard Deviation
Height of the Arm (HA) in cm	231.4	9.8	227.5	6.9
Jump with one hand (JOH) in cm	288.2	11.0	284.6	7.0
Jump with two hands (JTH) in cm	277.3	9.3	273.1	5.5
SJ in cm	25.34	3.4	26.8	3.8
CMJ in cm	30.69	3.8	33.5	3.2
RJ15sec in cm	26.9	4.2	28.4	4.5
(CMJ-SJ)x100/CMJ	17.3	3.3	19.25	4.06
RJ15sec/CMJ	0.8	7.2	0.8	9.1

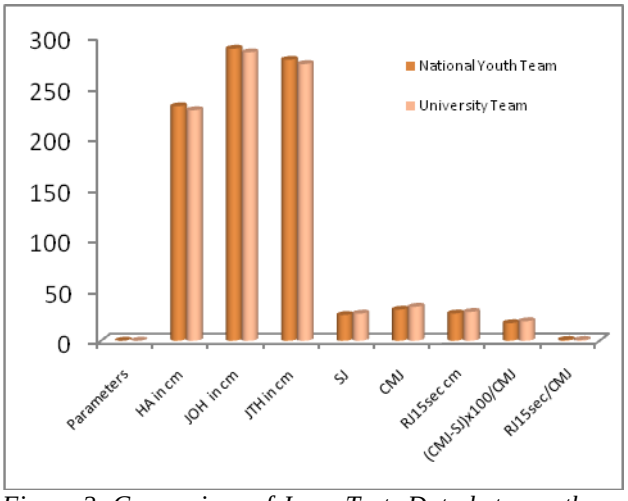

Figure 2: Comparison of Jump Tests Data between the National and Local and University teams of Albanian female volleyball players

From the comparison of the jump tests between the teams, the elite team displays slightly higher absolute values of HA, JOH and JTH and equal differences for the all three. The difference in HA is equally reflected in the two jump tests, JOH and JTH (4 cm: 1.4-1.7%). As for more specific performance parameters (RJ, CMJ and RJ15sec and calculated CMJ-SJ)x100/CMJ and RJ15sec/CMJ), the university team shows instead better values both in absolute and relative terms; the differences range from +5.5% for SJ and RJ15sec, to 10-11% for CMJ and the calculated (CMJ-SJ)x100/CMJ. No difference was found for RJ15sec/CMJ, but university team has a higher variance for this indicator.

A comparative analysis between two sets of performance /jump parameters, (HA, JOH, JTH and SJ, CMJ, RJ15sec, (CMJ-SJ)x100/CMJ, RJ15sec/CMJ) for each and comparatively between the teams are presented in Figures 3, 4 and 5 below.

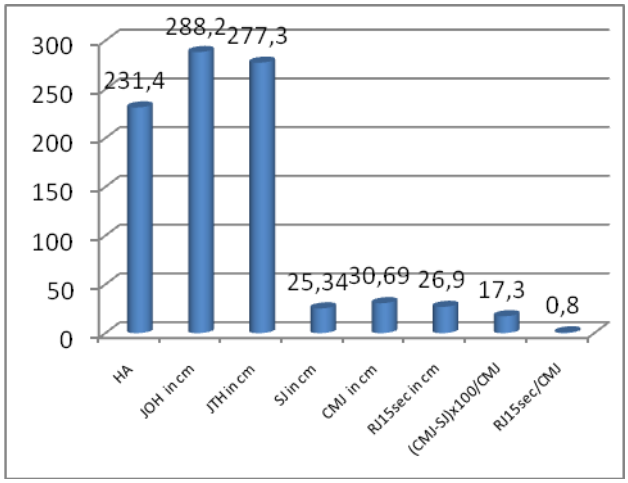

Figure 3: Comparison between Jump and specific performance Parameters in Youth Albanian female volleyball team

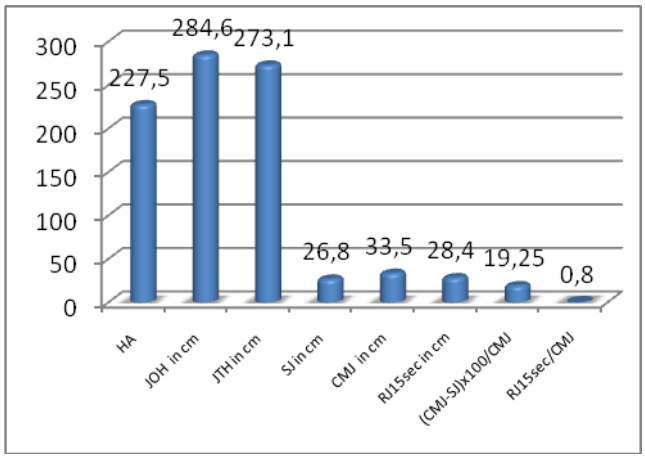

Figure 4: Comparison between Jump and specific performance Parameters in university Albanian female volleyball team

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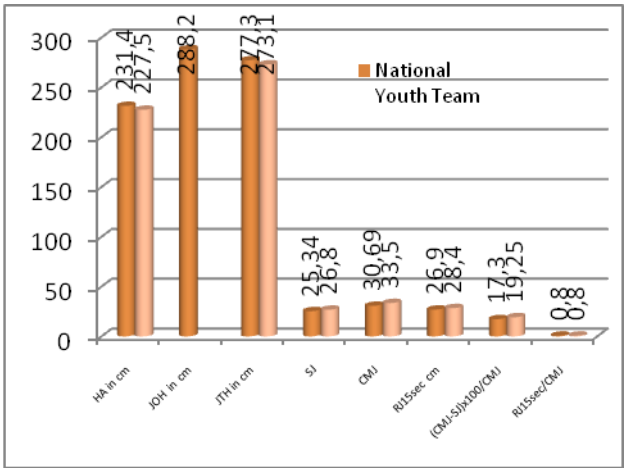

Figure 5: Comparison Jump/Specific performance Parameters between the Youth and University female volleyball team

The comparison reveals surprisingly, but in line with the previous interpretation and discussion, that the elite team which presents better physical parameter values, i.e. higher BH and HA, as well as generic performance tests data, displays lower values for more specific performance characteristics SJ, CMJ, RJ15sec, (CMJ-SJ)x100/CMJ, RJ15sec/CMJ.

Despite the differences between the teams, the results of this study in terms of absolute values, the deviation range and the differences between the teams, show however a continuous improvement of the physical and performance parameters in our volleyball teams, compared especially to the last 5-10 years (A. Pogoni, E. Pashai, 2003). The differences call however, the need for reflection and planning of specific, team and individual oriented training and nutritional programs, in order to improve both anthropometric and body composition values which are under training influence and at the same time directly reflect on the physical performance (S. Fleck, et al., 1985).

It is up to the coaches to further analyse these parameters, understand the individual and training factors and also elaborate appropriate programmes aiming the improvement of such parameters; these analyses should stand on the basis of the preselection and selection processes and procedures for the elite players of any level.

Haematological ProfilingMarkers.

The haematological profiling was performed through analysis of the 10 blood markers in all 24 individuals under investigation. The data of such parameters for both teams are shown in Table 3 below through the team mean and the relative standard deviation for each parameter.

Table 3*: Haematological markers analysed in Youth and university fenale volleyball teams*

		National Youth Team		University Team		Normal Values
	Parameters	Mean	Standard Deviation	Mean	Standard Deviation	
1	WBC $x10^9$/L	5.41	1.08	5.48	1.49	4.0 - 10.0
2	Lymph $x10^9$/L	1.81	0.2	1.98	0.48	0.8 - 4.0
3	MID x 10^9/L	0.46	0.1	0.42	0.12	0.1 - 0.9
4	Gran x 10^9/L)	3.14	0.9	3.07	1.11	2.0 - 7.0
5	Hgb g/L	119.5	10.83	122,28	13.12	110 - 150
6	RBC x 10^{12}/L	4.18	0.23	4.38	0.38	3.50 - 5.00
7	Hct %	36.35	2.35	37.22	3.37	37.0 - 48.0
8	MCV fL	87.08	6.3	87.65	5.66	82.0 - 95.0
9	MCH pg	28.53	2.7	27.81	2.04	27.0 - 31.0
10	MCHC g/L	327.9	10.6	327.28	10.02	320 - 360

The investigation and analysis of the 10 blood markers revealed mean values within the norm for most of the White Blood Cell population for both

teams, considering gender and age. WBC population shows also lower differences between the groups.

The situation shows different for the red blood cell population: teams values show low or tendency to the lowest norm levels for 5 out of 7 parameters of RBC population and markers to them related (Rbc, Hgb, Hct, MCH, and MCHC). Haematocrit shows a lower level than the norm for both teams, Hgb is at the lowest level of the norm, MCH and MCHC around the lowest norm levels for these parameters. Although no significant differences were found between the teams means, the youth team display slightly lower values (around the lowest normal limits) for Hct, Hgb, MCH and MCV. Worth also to mention the high variance of the Hgb values among individuals for both teams. These data, combined to low levels of Haematocrit, relative low RBC counts and tendency to lower levels of MCH, MCV and MCHC should call for special attention to anemia problems within the teams. As a matter of fact the youth team, having a younger age range, which could probably explain the above results in this particular group/team and which, should be taken into consideration for this group and the players individually.

The above results at both team and individual level could be used firstly, to identify eventual health or performance related problems and secondly help and guide the coaches and players themselves to take the proper measures and plan the most appropriate traning programs to better fit the players and the team as a whole.

Discussion and Conclusion

This study evaluated the anthropometric, performative and haematological parameters of two representative groups of female volleyball players in Albania; one national, youth and a collegial/university team. The present investigation provides an insight into these characteristics, makes an overall analyses and group profiling through such parameters with respect to age and comparisons between the teams in function of individual and group profiling as well as for the performance based selection process and criteria.

The obtained results show that the national youth team displays better values for physical, body composition and generic jump tests parameters but special and specific abilities could be found and appreciated in the university team although with less better starting anthropometric and physical characteriscs. However both teams display mean performance values which under the referent homologue European teams of same level and of national and/or local representance.

The physical parameters are colineary correlated to jump performance tests in both teams but with better values in the university team, which is different from the expectations. Age, trainability, quality of training programs as well as commitment or other factors may lie under these differences whish should be extendely and more in depth analysed both at team and individual level.

Haematological profiling does not show evident differences between the team groups; however these markers signal for eventual health or performance related abnormalities especially those related to anemia, which is a predictable and expectable health problem for this gender and age group. Additional markers and further and more detailed analysis at individual levels will be performed, in order to identify eventual positive or abnormal alterations which could involve both health and/or sport performance for the players and in relation to their team role as well.

The parameters of this study, alone and in combination with each other, at both team and individual level could be used to identify eventual health or performance related problems, help and guide coaches to identify and assess the physical and performance characteristics specific to the age groups for purposes of professional evaluation, selection, monitoring and continuous development, as well as for planning of the most appropriate traning programs to better fit the players and the team as a whole.

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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THE MOTRIC STRUCTURE AND DYNAMIC OF HANDBALL

CAZAN FLORIN[1], RIZESCU CONSTANTIN[1], GEORGESCU ADRIAN[1]

Abstract

Motric structure of the game is the size cause the effect that leads to the phenomenon and determine at a later date is determined by the nature of stress, psychological energy, physiology, etc. The structure of the game is on the way of organization and coordination of actions (forms, principles and factors) in the phase of attack and defense. The content of the game is composed of the various technical processes: keeping the ball, catching and passing, dribbling, throwing at the gate, integrated in various actions, namely technique in attack and defense. Modern handball game requires biotips, which acts at a pace where you merge elert in terms motric speed and strength with strength and skill. Effort in handball is characterized by submaximal intensity efforts, alternate, depending on concrete conditions of the game, with the maximal intensity efforts, an average or even breaks.

Conclusions: We can affirm that the handball is a sport which is characterised by the involvement of the two horses: aerobic and anaerobic metabolism in which effort has features, explosive types of flashing and movement are repeated in addition to high intensity depending on the situations of the game.

Key words: game dynamics, motric structure.

The motric structure of the handball game

Introduction

The motric structure of the game represents the dimesion that causes the phenomenon, in other words, it determins and then it is determined by the physiological, energetic and psychological demands of nature.

The structure of the game is given by the organization and coordination of actions (shapes, principles and factors) in the phases of attack and defense. The game consists of various techniques: holding, catching and passing the ball, dribbling, integrated in various game actions, meaning the technique of attack and defense.

The structure of the game in attack and defense is given by the attack and defense actions in different shapes based on the principles of coordination, objectively necessary, such as tactical execution of passing combinations in attack, attack preparation. The activity of players in a match game is basically the content of that game.

Modern handball is a fast game characterized by outstanding atletic performances made by athletic players.In fact, the modern handball players are able to perform very different movements: walking, side tripes, various runnings, jumps, change of directions, turnings and technical elements performed in a very short time and in a certain order determined by the tactical situation.

Running straight with and without the ball, the jumpings, the throwing, catching and passing the ball from a place or running are the characteristics of the

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Received 12.05.2012 / Accepted 18.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

modern handball player.

The content. The distance covered during a handball match is different depending on the position, that meaning that it depends on the position they play and the game pace. Hard games are always very demanding ones, stressful both in physiological and psychological point of view.

A handball match lasts 60 minutes, and it is divided into two halves with a duration of 30 minutes each. In this time the players cover distances between 4000 - 6000 metres depending on the rhythm of the game, the level of tiredness, their place on the ground, the attack and defense tactics characteristic of the team.

One of Cuesta G`s works shows how the distances were covered by the national team handball players of Spain, during a match, depending on their position in the field. For example: for left has come 3557 meters; for right 4083 meters, inter left 3464 meters, inter right 2857 meters; pivot 3531 meters.

In one study in Italy, with a specific device (Play Controller) 5000 meters were covered by the right wings during an official Italian league match

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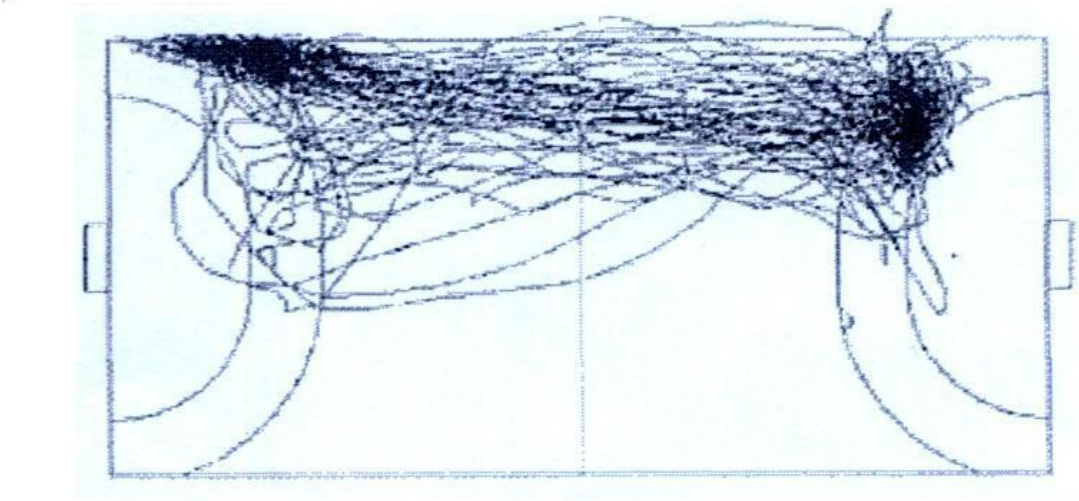

Figure 1 – analysis of extreme right during an official Italian league match. The player`s routes

It is very important to mention that the placement of the player in the field is determined by different parameters: their tactical distribution, their position in the field, the characteristics of the game, all of these being factors that might influence the area covered by players.

The data we collected show that handball is on the first division for the following reasons:

-the activities of a player in the first league (in the center) during a match:

- slow running 40`
- 160 throws
- 40 catchings
- 30-35 active defensive actions.

M. Buchheit offers us some illustrative figures for the activity during a game, of an international player who performs in Division 1 Championship in France.

Offensive actions

- 47 runnings to the gate
- 20 stops
- 5 actions 1x1
- 10 throwings
- 101 passes.

Defensive actions

- 66 defensive moments without control the striker (4`32")
- 78 defensive moments controlling the striker
- 13 outputs the pressing
- 14 neutralizations of the attackers
- 5 ball blockings.

Offensive and defensive moments

- 4 sprints of 2" (the maximum speed)
- 38 fast moments 2" / 3" (between 15-20 m)
- 6`, 20" moderate moments
- 38`, 12" walking.

As an indication, Cuesta (1991) showed that during a handball match, the players have 190 variations of the rhythm, make two changes of

direction and 16 jumps. Based on what he says, a performant handball player has a total of 4 high intensity changes in 60 minutes. (in average of 8 per minute). So, it is about many short and explosive actions, those actions requiring high effort during a physical education activity. Remarks were made on these figures be in a very weak game or an international game. The score at the level of the match is very close to each other 50 – 60 goals. Reporting these results to the percentage of successful results (in each attempt were scored x goals) , the lower striker needed more attempts than the international one,so , as a consequence, there are much more actions performed. This phenomenon that we quality for cavolcada is regulary observed ((http://www.martinbuchheit.net).

It is an important element that allows as to tell that the higher level of the game is, the less we run (there are less crossings of the field); in addiction to this, he must be strong in order to improve his percentage of success.

The physical training at an inferior level refers to the amount of work, and at the superior level to it`s quality (the amount being automatically provided, starting from the idea that the superior team trains two times daily) (http://www.coachesinfo).

This data taken from the specialty literature must be studied and used in the process of teaching by coaches, in order to ensure the quality and the efficiency of the training process.

Dynamic of effort in a handball game

The modern handball game supposes special biotypes that acts at a rapid pace and combines, metrically speaking, the speed and the force together with the rezistance and ability.

The effort in handball is characterized by alternated submaximal intensity efforts, depending on the specific circumstances, together with maximal intensity efforts, medium effort or even pauses.

The more the player evolves at a high performance level, the better are the energy requirements and the stress during the match. The match at a high intensity is still possible if the players pay enough time for training and if the training is conceived starting from the specific requirements of the positions of the players in the team.

The intensity of the game depends on the level of the players level of qualification. The higher the level is, the higher the intensity is, too.

The most important fact underlined here is that the handball player covers the entire distance, alternating the high intensity activities (jumps, changes of direction, sprints) with the phases of a game, characterized by the metabolic needs due to the high necessities of the activities during the match. One may say that the metabolic demands of the modern handball imply aerobic and anaerobic energetic mechanisms of the player.

Handball is a discontinuous activity which is determined by the high intensity moments (the energy is largely provided by ATP-CP and the anaerobic ways) and also by the low intensity moments (where the aerobic mechanism function as an active rehabilitation).

In one of Lupo`s works on the Italian national team sports men during friendly games, it was found an average number of cardiac frequency of 145 beats per minute. The maximum rate of cardiac frequency was 190 beats per minute and the lactate amounts were 4 mmol/l. (Lupo S, 1996)

Other figures found between 1996- 1998 showed that the cardiac frequency rises from 140 beatings per minute to 200 beatings per minute. The values of a cardiac frequency may be incorrect, unless an accurate analys is made and it is not taken into account the distribution of the Sport men on the field. In fact, the average of these information doesn`t express useful information about the handball players activity during a match.

For example, in Figure 2 we can see the frequency of a heartbeat of a handball players during an official match.

If we consider the medium rate of a cardiac frequency (150 beatings per minute) and the time spent in the aerobic area (70-85% of maximum FC, see the pictures 2 and 3), we may likely say that the aerobic metabolism is the most important physiological mechanism in handball.

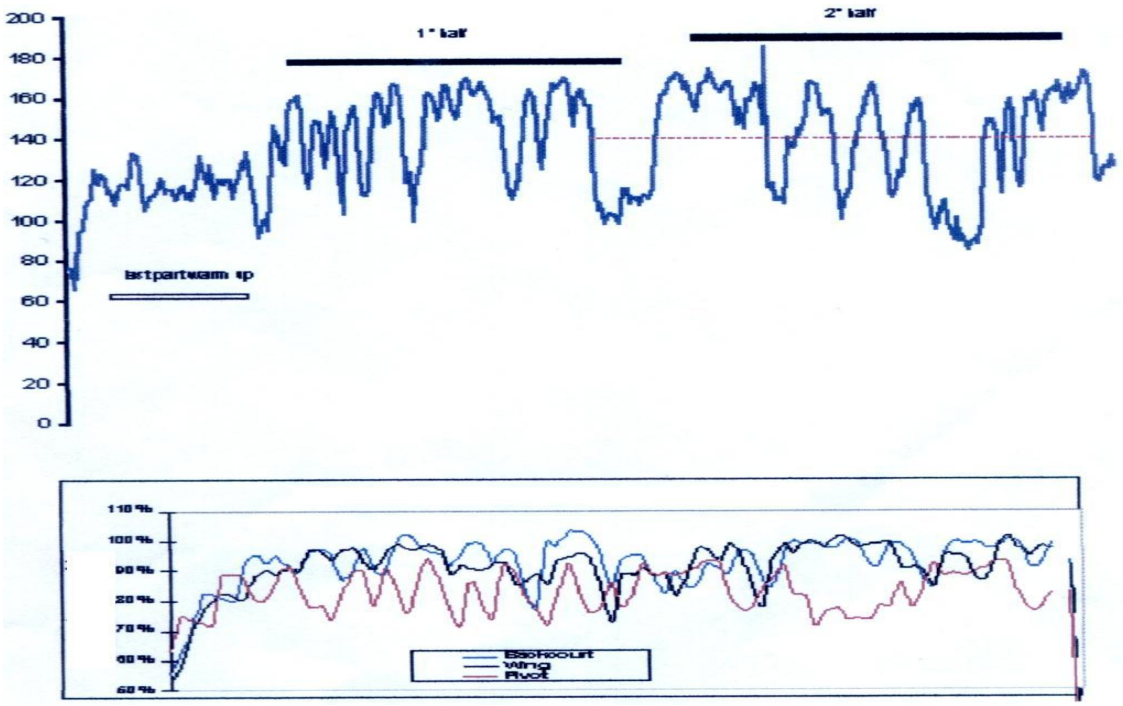

Fig.2 a) heart rate of a handball player in the Italian national team during the match
b) heart rate as a percentage of OBLA threshold measured by Mader test in handball
c) players in the game (Colli, 1997).

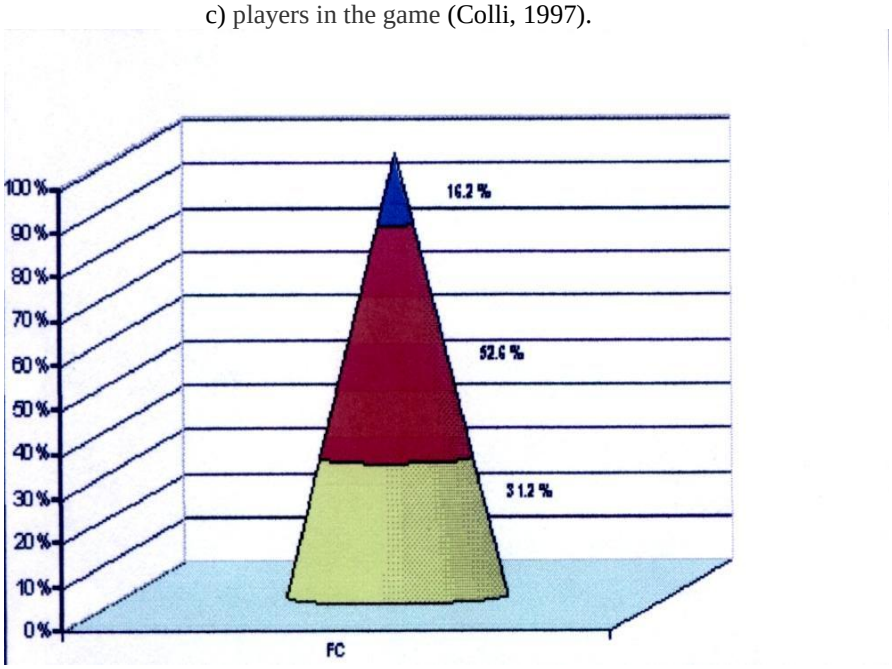

Fig.3. The distribution of the cardiac frequency in match. The data refers the heartbeats in picture 2. This data are expressed as a percentage of the total time. The red colour shows the aerob time measured with the Mader`s test.

This conclusion was drawn many years ago and many coaches are still convinced of the importance of the aerobic capacity and its power in training in order to achieve high performance.

A procese analysis of a handball performance should take into consideration that the most important actions (those ones voluch make the difference), are the short high intensity moments that may lead to an increasing of hydrogen ious (H) allowing the formation of lactic acid in muscle cells, causing the decreasing of the P-H cells and the inhibition of muscle contraction processes.

The intense activities are followed by low rate activities or pauses (the active recovering), during which the oxygen consummation is directed to facilitate the transport of hydrogen ious, to recharge

ATP –S from APP and AMP and to promote the Cori cycle through voluch the lactic acid is turned intro glycogen. The lactic levels in a handball match are under 10 mmol/l, this being a medium compared to a 400-100 m running (Hirvonen 1992).

This means that the lactose is not a limiting factor in handball, although it should be emphasized, that training should coutain exercises that should lead to this quantity of lactose to cause the particular adjustements for the handball players.

In Delamarche`s research work, the lactose levels measured in a French league match reached values between 4-9 mmol/l.The highest value was certainly reached by the most active players. (P. Delamarche 1997).

Similar values 7-10 mmol/l were found during international games of professional teams.

In conclusion, based on these observations, we can say that handball is a sport characterized by the involvement of the two metabolic pathways; the aerobe and the anaerobe ones, in which the effort has discontinuous characteristics and the explosive types exercises are repeated in addition to a high intensity depending on the circumstances during the game.
Equally important is to understand that it is impossible for the power to increase from one year to another, without first to increase the strength.

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INCREASING THE EFFICIENCY OF THE THROWS FOR GOAL, FOR THE PLAYERS OF 9m IN THE HANDBALL GAME, USING THE PRINCIPLE OF INDIVIDUALIZATION

CICMA IOAN TEODOR[1], RAŢĂ GLORIA[2]

Abstract

Purpose. This work presents the advantages of using the principle of individualization, by comparing it to the collective work, to increase the efficiency of the 9m throwing for goal.

Methods. To verify the hypothesis and to achieve the purpose of the work, there were used: the method of observation, the individual work (throwing jump for goal preceded by dribbling), the group work of two athletes (throwing jump for goal preceded by pass from teammate), test method, statistical and mathematical method, graphical method.

Results. Following the initial and final tests, we see that the experimental group progressed 33.34% for throwing efficiency, 15.53% recorded from the control group, the difference in progress between the two groups of athletes being 15.53, (tests consisted of 15 throws for goal from jumping, successive achievements expressed in percentage).

Conclusions. Following the final results of the experiment, it can be said that the hypothesis was checked and the purpose was achieved; we can therefore conclude that the principle of individualization, scientifically applied and used, can increase the efficiency of throwing for goal, for the 9m players of the handball game.

Keywords: efficiency, individualization, handball, principle.

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Email: cicmadoru@yahoo.com
Received 11.05.2012 / Accepted 18.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

Introduction

The present work puts into value the advantages of an important principle of sport training, and that is the individualization, applied in the training of the handball performance players.

The aim is to demonstrate that by a good management in applying it on a scientific basis we can significantly increase the efficiency of the 9m throwing jump for goal.

"The handball game takes place on a background of intense physical demands, with a highly educational and formative character.

We notice a rigorous scientific organization tendency of the training process, and linked to the development of qualitative trends towards a quick game and with a series of varied and complex techniques and tactical actions" (I.T. Cicma, 2010).

"The beauty of the game is given by the explosive, in the lower limbs and by the take-off height, the one which actually ensures both the transmission of the ball from one player to another, and the vision of the opening and occupation of the goal by the goalkeeper" (G. Raţă, B. Raţă, M. Raţă, 2010).

"Handball, as a performance sport, demands a series of hard work from the part of the sportsmen in order to resist the difficult tasks during the training, tasks which involve the total participation of all the physical, moral, will and intellectual capacities" (E. Baştiurea, 2001).

The research hypothesis started from the supposition that by making up and applying some complex means of action, properly planned and standardized, we can increase the efficiency of the 9m specialized players during the collective game.

Problem statement

As any activity with an interdisciplinary profile, the sport training gets modernized and this change is so fast that the studies developing in the area cannot keep up with it sometimes.

"The training is a unitary process, developing in accordance to the general laws of the performance

development according to the level of the propelling force, the intellectual capacities and the psycho-propelling traits" (E. Bastiurea, 2001).

The sport training is defined as a pedagogical process taking place systematically and continually, gradually getting the human body used to intense physical and psychical effort which is a must in taking part into competitions organized in different sport areas.

There is another definition saying that the sport training represents the pedagogical process taking place in order to prepare and adapt the human body to both physical and psychical efforts imposed by the competition itself.

The most important objective of the sport training is the development of the performance capacity.

"The sport performance is defined as a bio-psycho-social value in the official competitions, as a result of a capacity continually determined and appreciated, on the background of some rigorous criteria or targets" (A. Dragnea, 1996).

One of the definitions of the sport training is given by the "Terminology Dictionary", saying that the sport training is a "continuous and systematical pedagogical process to adapting the human body to intense physical, technical-tactical and psychical efforts in order to get high results in one of the forms of competitive practice of exercise".

The notion of training is the same with the one of sport preparation, the concept of training subordinating the bases of the training itself (all the laws and principles which constitute the background of the sport training), established by the theory of sport training (a system of principles and methods which both make up and structure at the sport training itself), according to the principles of training (main ideas, pedagogical, psychological, physiological, hygienic ideas and other ideas structuring the whole training process).

As to the sport training, it is necessary that the correspondence between the body capacity and the imposed requests should be followed. The disproportion between the physical and the psychical capacity of the sportsman can be damaging.

The sport training is made up of the following components: the operating pedagogical component, the biological component by its objective effects on both the functional development and the adaptability level of the human body, the psychological component by its character, moral and emotional implications, the sociological component by the means and way of social, economic and cultural integration, the hygienic component by its specific feeding and rest conditions which help the sportsman train and refresh, the ethical component by its fair-play ideals of total commitment during both the training process and the competition and, nonetheless, the esthetical component by its beauty and refined propelling, by the complex and nice propelling motives and, in the end, by the show that the entire sport process gives.

The sport training is also a complex process and its complexity is given by certain traits such as: the sport training is part of a system having minimum two elements and these are the coach and the sportsman, it takes place in an institutionalized environment, it is done according to some principles, requests and norms on pedagogical, biological and psychological bases, it creates norms on short or long programs, it goes by strategies originally elaborated on interdisciplinary bases, it is a process taking place according to some training and performance objectives which are also components of some management projects, it is a process made up of stages, or levels as it is a long one, it is also an activity that could be seen from a

cybernetics point of view, developing according to the complex dynamic systems.

The capacity, coming from the Latin word "capacitas" refers specially to the success possibilities of the individuals as "tasks required by the job" (H., Pieron, 1957, citat de A., Dragnea, 1996).

In order to improve the performance capacity in the sport training, we must know and understand the factors which contribute to its highest level.

The means of the sport training are divided into: means of general training, mixed means and means of specific training.

The important factors which contribute to the growth of the performance capacity are as follows: a continuous perfecting of both the strategies and the criteria of selection, a serious growth in the working volume of the handball players, interdependence between the content and the methodic of the training of both performance and high performance sportsmen and the competition demands of the game, a considerable growth in the effort during the training process, a growth in number and importance of the non traditional training means, a growth in the social position and a growth in the number of youngsters who wish to be a part of this kind of activity, a scientifically based management of the training, an acceleration of the effort capacity, the rationalization and the standardization of the main means of training.

Taking into account the fact that the sport training is above all a didactic process with multiple implications, it is necessary to divide the principles of the training into general principles and specific principles.

The general principles of the training are made up in accordance to a certain taxonomy of criteria, starting with the most general aspects of the sport activity and its objectives, and continuing with the adequate content, methods and strategies, a taxonomy which comprises principles of both the training aim and the multilateral personality development and also the socio-professional integration of the sportsman, a maximum efficiency and economy, as well as theory and practice becoming complementary, principles regarding objectives such as the maximum point of the capacity of performance, the development of propelling force aptitudes, cognitive, affective and emotional aptitudes, the checking and at the same time the evaluation of the relationship between the coach, the sportsman and the scientific research team, principles regarding the content such as inter-disciplinarity, rationalization, operationalization, and methodic-strategic principles such as individualization, motivation and voluntary effort, awareness, the inter-action between the verbal and non-verbal means, accessibility, learning in excess, shaping, simulation, specialization and self adjustment.

The specific principles are purely biological as training implies, above all, a good knowledge and, nonetheless, obedience to the laws governing the processes of human adjustment to repeated external excitants, that is the physical effort.

Reaching the objectives of the training presupposes the use of a great number of all sorts of exercising applied in certain conditions of hygiene and environment.

These exercises are used by methods and method combinations of some devices and equipments.

The means of training represent in fact the practical instruments ensuring the sportsmen training in order to gain performance physically, psychically, and also as far as movement is concerned.

Nowadays the means of training have diversified and have become more complex thanks to the development of thinking and by the induction of new knowledge from other fields of activity.

We therefore witness new branches in sport and, at the same time, new technical combinations which are getting more and more difficult in some branches, we also witness the perfecting of the sport tools and investigation devices.

At guiding the training, the response of the sportsmen body to effort during sessions and different kinds of micro-cycles has got an important role.

"The training sessions with the whole group meant to ensure the basic training of the sportsmen and, at the same time the general training of the team, do not actually sort out the improvement of the handball players' performance, that is why, the training of the handball players must be done with sessions of individual training" (I., Bota, 1984).

During the training, it is necessary to follow the correspondence between the body abilities and the demands imposed as a disproportion between the demand and the physical and psychical abilities of the sportsman is harmful.

The principle of individualization imposes that the training purposes and tasks, the procedure, the character, the intensity and the duration of the physical practice be chosen according to the sex and the age of the sportsmen, according to the functional disposals, degree of training and health, by taking into account the psychical qualities, traits of character, etc.

This thing presupposes a good knowledge of the sportsmen particularities by a permanent check on their behaviour, balancing the training effort and both the physical and psychical abilities.

The coach must get data on the sportsman response to effort, at competitions, during and after the training and also, the coach must get data on the way the sportsman gets back to normal afterwards.

The individualization is based on a good knowledge of the life, work, study and rest conditions, a good knowledge of the sportsman interests and aspirations, it is a principle getting obvious in the individual training sessions and it can expand on all the sportsmen, no matter their training stage or the classification category.

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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As far as concerns the performance sportsmen, and the high performance ones, the principle of individualization is compulsory.

The principle of individualization must not be mistaken for the work procedure which is used during practice sessions, namely the individual work of the coach with every single sportsman.

During the sport games, this principle diversifies as both the elder junior teams and senior teams are actually a mixture either of age, training or even of effort and functional abilities.

"The principle of individualization is in fact the maximum value of the sportsman availability, in this way ensuring the maximum development of performance" (A. Dragnea, S. Teodorescu, 2009).

The principle of individualization demands that the training purposes and tasks, the background, the type, the intensity and the duration of the physical session be chosen in accordance to the sex and the age of the sportsmen, to their functional abilities, to their degree of training and to their state of health, by taking into account the psychical abilities, the traits of character, etc.

Therefore, the training of the team members cannot be the same, the effort, its intensity, the development of the propelling force will be different from an individual to another.

By taking into account all the above, we can say that the efficiency of the training sessions is not basically given by the general methods and means used for the whole team, but by other provisions which ensure the maximum values of the abilities and results of each sportsman.

Procedures and research methods

Coaches must use methods and means to suit each sportsman's personality, as the principle of individualization implies suitable measures not only concerning the training, but also the education, the moral portrait and the shaping of positive traits of character.

Hypothesis of this work is if using the principle of individualization, we can increase the efficiency of throws for goal.

In order to try the suggested hypothesis, I made an experiment using the juniors II team, at 'Sports High School' in Braila, a team joining the National Competition of Juniors, from the year 2010 to the year 2011, on a number of 10 players playing or aiming at the 9m category, divided into two groups of 5 sportsmen each.

I mainly intended a growth in efficiency of the throws for goal in proper game conditions for the players of the 9m category.

During the experiment I did two tests: the first one, that is the initial test, in September 2010, and the final one in May, 2011.

The testing session I chose and organized, which is an extremely significant one, consisted of 15 successive throwing jumps for goal preceded by dribbling.

The results were calculated in percentage and compared to those of the witness team who had previously followed the training session with the whole team.As a method suggestion, it is not recommendable to use so and so sessions, even though they appear to be what it is looked for, but to take advantage of the qualities and abilities of both the sportsmen and their coach.

To verify the hypothesis of the work, there were used: the method of observation, the individual work (throwing jump for goal preceded by dribbling), the group work of one athletes (throwing jump for goal preceded by pass from teammate), test method, notaries method results, statistical and mathematical method, graphical method.

In the tables below are presented the results of the final and initial tests, as well as the progress registered by the two groups and one group from each other.

Results.

Studying the results obtained, we observe that progress in the experimental group is more than the control group.

Table 1. Control group test

Nr.crt	Nr. throws		Nr. throws successful		Percent throws successful		Progress
	Ti	Tf	Ti	Tf	Ti	Tf	
1	15	15	6	9	40%	60%	20%
2	15	15	8	11	53.3%	73.3%	20%
3	15	15	9	10	60%	66.6%	6.6%
Media percent					51.1%	66.6%	
Progress	15.5%						

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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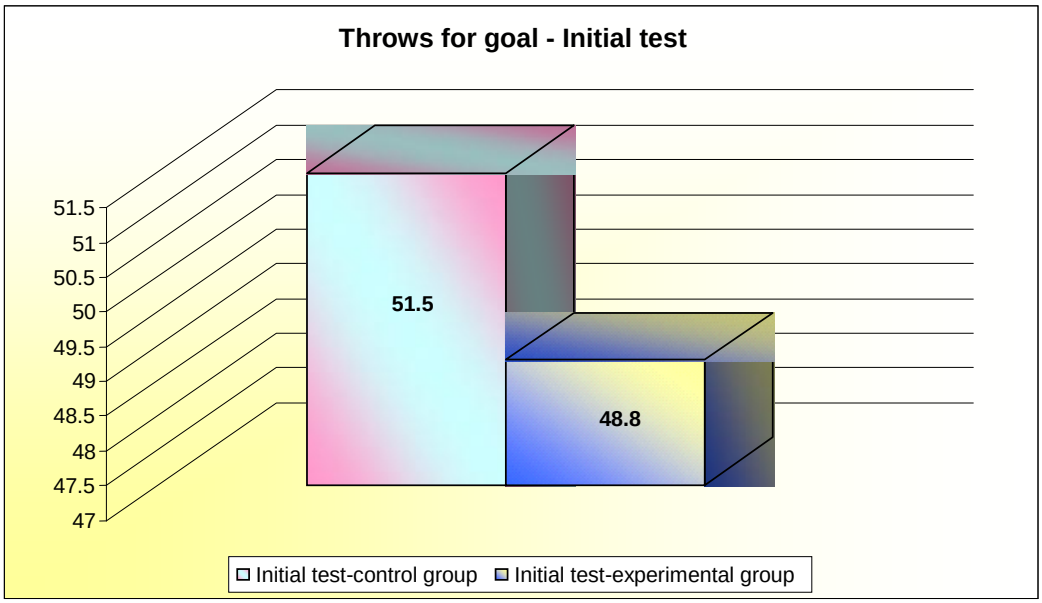
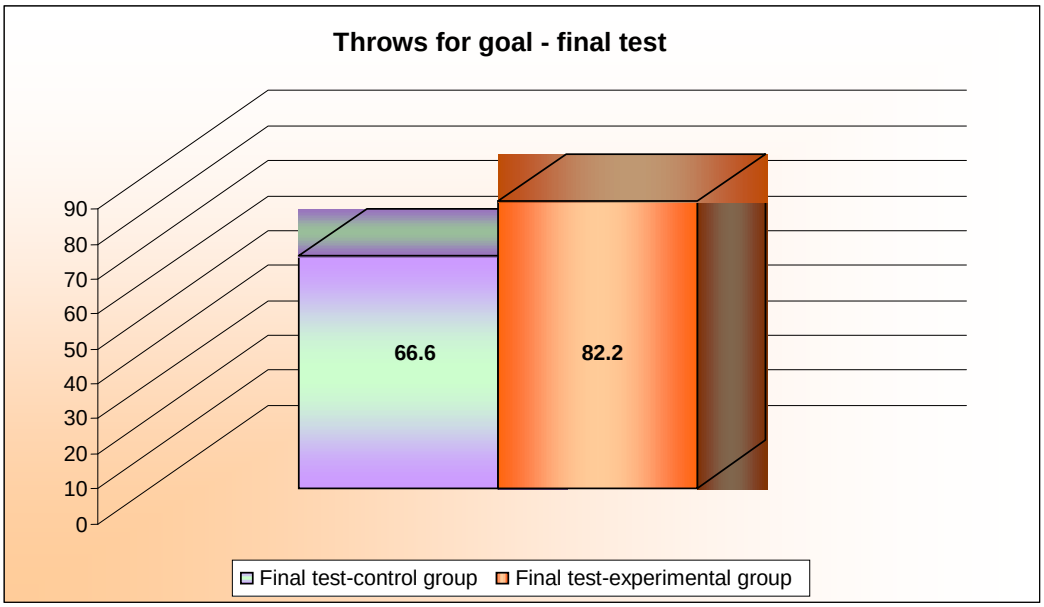
Table 2. Experimental group test

Nr.crt	Nr. throws		Nr. throws successful		Percent throws successful		Progress
	Ti	Tf	Ti	Tf	Ti	Tf	
1	15	15	7	12	46.6%	80%	33.4%
2	15	15	9	14	60%	93.3%	33.3%
3	15	15	6	11	40%	73.3%	33.3%
Media percent					48.8%	82.2%	
Progress	33.3%						



Graphic 1



Graphic 2

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Vol. XII, ISSUE 2 Supplement 2012, Romania
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Graphic 3

Conclusions

By looking at the results on the two tests, as well as by trying the hypothesis of the present work, we can consider that the methods and the action means chosen and used during the training sessions turned out to be efficient, therefore, the hypothesis of the present work is real, meaning that, by its correct use, within a year of training, it was possible to increase the efficiency of the throws for goal of the 9m players, specialised into the 9m throws.

The significantly better results at the final testing of the witnessing team demonstrates the fact that the principle of individualization properly applied and at the same time applied on a scientific background, can increase the efficiency of the throws for goal of the 9m players, specialised in the 9m throws.

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

EFFECT OF PHYSICAL AND TECHNICAL TRAINING ON THE SHARE OF INDIVIDUAL AND COLLECTIVE TACTICAL ACTIONS, IN A OFFICIAL GAME OF HANDBALL, AT THE JUNIORS TWO (JUN. II)

CICMA IOAN TEODOR[1], MEREUŢĂ CLAUDIU[1]

Abstract

Objective. The purpose of this paper is to present and demonstrate effects of an physical and technical optimal training, scientific and rigorously conducted on the share of the individual tactical actions and collective tactical combinations, in an official handball game.

Methods. To verify the hypothesis and to achieve the purpose of this paper, there were used: specialty literature study method, the observation method, the experimental method, the game protocols elaboration and a individual observation records method, statistical-mathematical method, graphical method and data interpretation method.

Results. We notice that, at the first game, without a special physical and technical training, the total share of a individual and collective tactical actions, was 55,33% percents, and in the second game, the total share of individual and collective tactic actions was 70% percents, progress being 14,67% percents.

Conclusions. At the end, after studying game protocols and an individual observation records, we can say that the hypothesis was confirmed and the purpose has been reached.

So we can conclude that through a physical and technical optimal training rigorous and scientific conducted, we can reach a positive effect on share of individual and collective actions, in an official game.

Key words: preparation, effect, on share, training, physical, technical, tactics, handball game.

Introduction

Handball as a scientific discipline is part of the theory and methodology of physical education and sport, with the proper domain of study the game of handball in the technical, tactical, physical, theoretical, methodological, organisational and psychological, sociological implications and selection and teaching.

Handball contributes to the acquisition of basic motor skills and specific knowledge of specific technical and tactical sport.

It is a dynamic game and requires the subjects an intense exercise and a great psychological commitment.

Handball game practiced scientifically effort contributes through the effects of the physically and mentally efforts, to strengthen health, physical and intellectual capacity, volition and moral practitioners.

Handball game is considered a basic overview of human motor skills such as running, jumping, catching and throwing, with positive effects on the physical preparation of athletes from other branches.

Handball is a collective game with a strong dynamic character because it takes place in a very fast rhythm.

There is a rapidly evolution of the game recording trends such as improving the technique to master at a growing number of players and fewer technical errors, obvious increase game speed, with a good grasp of technique and tactics , individual actions are increasingly subordinated to the game collectively through the obvious strategies to most teams, use with cunning precision and security means collective tactics, specializing in jobs, both in attack and defense, is a growing trend evident their efficiency and positive developments, request all the qualities thought by judging each point in the game.

In handball, sports performance is determined by several factors which make the mutual interdependence of these factors being variable and dependent on the skill of the individual sports, team, and the specificity of each national handball schools.

Sports training specialists in this field concerns the result of concerns that have resulted in a set of principles and knowledge to the process of preparing athletes called Sports Training Theory and Methodology.

If we consider the views, opinions, rankings and specialists in the field theories, we can say that: the athlete is a licensed practitioner, competitor that focuses on performance.

Sports Training Theory and Methodology defined sports training as "Systematic and continuous process of teaching gradually developed, the human body adapt to intense physical and mental efforts to obtain a sports performance."

A definition of athletic training is given in the “terminology dictionary ", according to which sport training is a "systematic and continuous process developed gradually teaching the human body adapt to the physical, technical, tactical and psychological intense in order to achieve high results in one of the forms of competitive practice exercise ".

The concept of training includes training bases representing all the laws and principles underlying the established sports training and conditioning sports training theory, which in turn is a

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Received 11.05.2012 / Accepted 18.08.2012

system of principles and methods that makes and structures sports training, according to the principles of the training that involves basic ideas, the pedagogical, psychological, physiological, hygienic and others conducting structures and leadership training process.

A. Dragnea in "Sports Training" reveals that "sports training is a long process, designed as a motor and functional performance in order to achieve a competitive behavior in a contest, this behavior is the result of upper body adaptation to physical effort and mental intense " (A. Dragnea, 1993).

The physical training as a "complex educational process, organized over a long period and completed by successive adjustments, optimal, up to the maximum adjustment, expressed as maximum sports achievement mastery and maintaining it in time".

Gh. Cârstea in 1999, considers training as an "instructive process - educational systematically and continuously carried out gradually, to adapt the body to intense physical and mental effort in order to obtain high results in one of the forms of competitive practice physical exercises/drills ".

Problem statement

Nicu A. (1994) says that methodology evolves constantly training and support the objective of it is physiological support. In his view, training is seen as a complex, comprehensive, psycho-social, morpho-functional and methodical teaching, which aims to create an individual with a high level of sanogenesis, a higher degree of resistance to various environmental factors or endogenous, with great effort and balance capacity and cortical neuro-endocrine-vegetative appropriate, all embodied in the possibility of obtaining special sporting performance.

He lays some physiological training principles such as: accessibility (the ability to support an effort), versatility (development complex multilateral athlete), individualization (correlation of age, sex, family history and personal status health, functional capacity), continuity (the continuity of training), grading effort (gradual increase in effort), use of sustained efforts in training (great efforts are effective means for increasing functional organism, stability of internal environment - homeostasis), alternating with the recovery effort (effort is the ergotrope, recovery is the trophotrop part).

Sport training has principles, methods, tools and components; all leading to the aims and goals of training that is optimal for contests and competitions and achieve the best possible performance.

"Principles of sports training are theses or general rules, which directs all sports training activity" (O. Bompa, 2001).

The means of sports training are practical tools that work and prepare athletes performance to obtain skills, sports performance or capacity, addressing at the same time to propelling spheres, physical and mental.

The resources of sports training can be classified in class means or means of training, recovery means and means of competition, starting from the main forms of organization.

At this stage AS means have diversified and became more complex, because of thinking (creating new combinations) and by introducing new knowledge from other fields.

We are witnessing the emergence of new fields of sport, yet the creation of technical combinations increasingly difficult sports like gymnastics, figure skating, etc.., the improvement of sports materials, facilities, research equipment, etc..

It was reached to the new forms of recovery developed by doctors and psychologists to ensure the possibility of the organism to make high efforts.

Thus the conditional abilities (strength, speed, resistance), a neuro-muscular energy infrastructure is created that enables support for specific efforts of the volume and intensity of effort, that act in parallel or in combination over the processes that the performance depends on.

On coordinative capacity, improving analyzers need to recognize as quickly as optimal muscle tension adjusting degrees of freedom of movement, maintaining balance, spatial orientation and developing the most of skills, enabling them to use skills and propelling skills in specific technical and finally, obtain superior results.

Methods are "chained logical operations structure established to achieve a goal or an aim" (A. Dragnea, 1996).

It notes that sport training uses many methods, some common to those in physical education.

This fellowship does not require an application like methods, but their inclusion in training classes with superior characteristics and in different organizational conditions.

The essential feature of training methods is given by the ratio of energy consumption and fatigue accumulation, on the one hand, and the rest needed restoration, on the other hand, in other words, the game of rest and exercise.

Methods are multifunctional and can lead to achieve different aims regarding the development of physical, motor skills development, improvement of exercise capacity and improvement of training some skills.

"Methodical procedure is defined as private way, for the implementation of a method" (O. Bompa, 2001).

The choice of methods is based on training objectives to be achieved, most notably performance capacity.

The classification of methods in sports training is conducted in two broad categories: methods that rely on stress-rest relationship and methods that

rely on part-whole relationship or providing training competition and gives us an insight into the effectiveness of training.

The content athletic training "designs those elements of structure based on functional and methodological laws and rules, determines achieve sports performance" (A. Dragnea, 1996).

Sports training content has become increasingly complex due to the evolution from sports performance to specify the design and methodology of work.

Advances that were made, it appeared the need of systematization of the training content according to certain well-defined rules, the basic rule is one that relates to the purpose and / or exercise effects that these have on different aspects of training athletes.

Sides which addresses these exercises are: physical, technical, tactical, mental, theoretical, artistic, biological, sides considered as components of athletic training.

Physical training is sports training component that has a special role in the entire training process, leading ultimately yield athletes in training and competitions.

It is the linchpin for all other components, the foundation for the entire training process and provides a high functional capacity of the body.

Due to its complexity, physical training ensures a high level of development of basic and specific motor qualities, optimal values of morpho-functional indices, a full possession in the exercises used and perfect health.

Physical preparation is important at all levels of training, being different from one sport to another branch in relation with their specific requests.

Thus to the beginner groups has a high share of time and means used, the valuable athletes give preparation time and smaller physical space, due to cumulative effects to their training over several years.

Due to various forms under which meets, physical training had to be systematized in general or comprehensive physical training and specific physical training.

General physical training provides basic motor skills development, functional capacity of the body in general motor skills enrichment general fund, the harmonious development of morpho-functional indices which determine the branch of sport practice, positive transfer of training specific to the sports industry.

Specific physical training is oriented mainly to the development effort capacity of an industry specific sports development priority and different qualities combined motor involved, ultimately leading to specific performance in some sports in which performance is strictly determined by the development of an increased motor quality and "specific gravity" of specific physical preparation, sports with increasing skill.

Specific physical training is done by means of specialized strictly determined by the particular branch of sport, muscles involved, the type of request, etc.

In the micro-cycle training, specific physical training has a bigger role from the second third of the preparatory period and throughout precompetitive stage.

Between the two types of physical training there is a close relationship, both athletes conditioning efficiency.

Technical training - a technique includes all branches of sport motor actions ideal executed in terms of their effectiveness. It involves making a rational and economical type of movement, specific branches of sport, established under their respective regulations in order to obtain higher efficiency in competitive activity.

The technique is important primarily by movement economy and efficiency, it is largely conditioned by the other components of athletic training, physical training in particular.

In preparation for beginners is a basic rule, namely, to ensure the necessary physical properties availability first technique, which involves a large number of repetitions.

Underdevelopment at the appropriate level of exercise capacity leads to a technical malfunction.

The technical training is not just a priority in all branches of sport.

In sports of precision and expression such as figure skating, artistic gymnastics, technical training must be very demanding, technical accuracy in establishing the primacy of competition.

The jog speed technique should facilitate in obtaining the maximum output.

In sports games and fighting sports, technology influences the priority of solving complex situations or fighting game.

The level of technical training of an athlete depends on the baseline and its motor experience.

Acquiring a piece of abilities and skills to move out an upper request of the sensory system, this fosters learning movements.

Technical components under the technique analysis and technical training so we can define:

Technical element that represents a fundamental motor structure underlying for practicing a sport branch, care to volleyball, handball throwing, are motor fundamental structures, which together with other industries that underlies to practice those branches.

The technique procedure is how to perform particular technical element, such as throwing at the gate by avoiding the handball, basket throwing through jumping, etc.

It is the result of factors such as: creation by coaches and athletes of new models of effective processes, taking account of morpho-functional

features and mental athletes, sports material quality, etc.

The style is personal imprint or how to perform a particular technique.

Although the basic mechanism of that process is followed, the morpho-functional and mental features still sink on execution, this implies a value of the athlete.

The basic mechanism of the technical process consists of a logical sequence of motor acts necessary to carry out effective ways: enthusiasm, fighting, flight, landing in long jump in athletics, etc.

It should be understood as a propelling act / acts / represented by space-temporal aspects (distance, position, direction, duration, rhythm), dynamic-energy aspects (strength, speed, precision, coordination, balance).

Procedures and research methods

The research hypothesis is the idea that if a rigorous physical training and technical and scientifically made, may increase the efficiency of individual and collective tactical in an official game.

The study tour took place in the Junior National Championship I, 2011-2012, the junior team of the Sports High School I Braila.

At this level the emphasis was on improving specific physical training and game improvement technology.

The methods used were, documentation, observation, practice, the method of filling in the observation sheets, statistical and mathematical method for interpretation of results and graphical method.

The evaluation took place over two official games, the first and last of the tour, noting in the observation chart the individual and collective tactical number of actions, previously established as the most representative.

Numbers of actions have been reported in an optimum number, and reported during the game, which is for 25 shares.

Results

Table 1. Tactical actions before using individualization principle

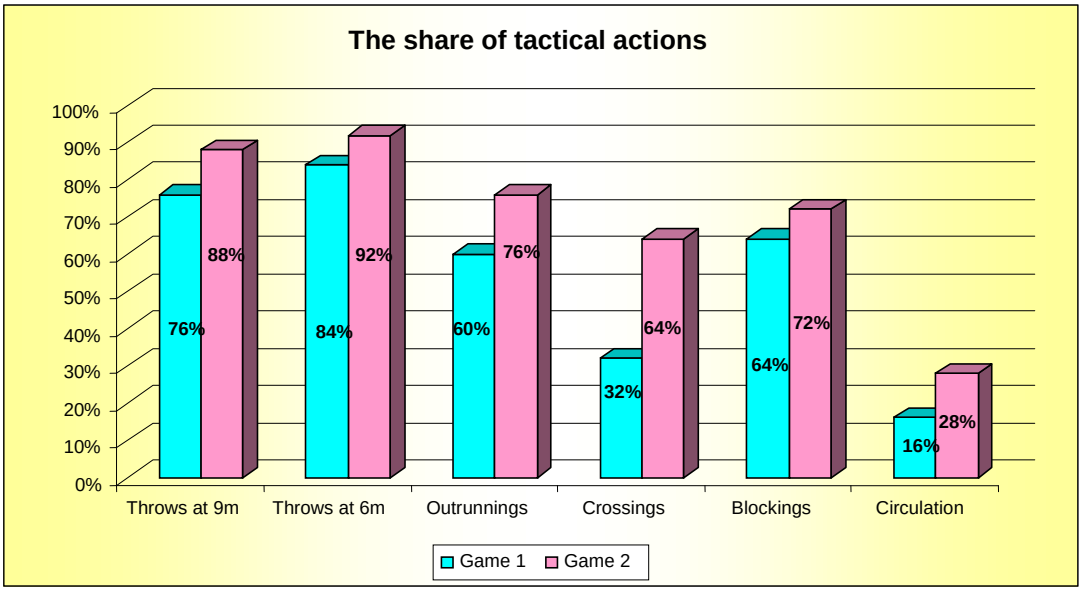
N° game	Throws at 9m	Throws at 6m	Outrunnings	Crossings	Blockings	Circulation
1	19	21	15	8	16	4
2	22	23	19	16	18	7
Max	25	25	25	25	25	25

Table 2. Tactical actions after using individualization principle

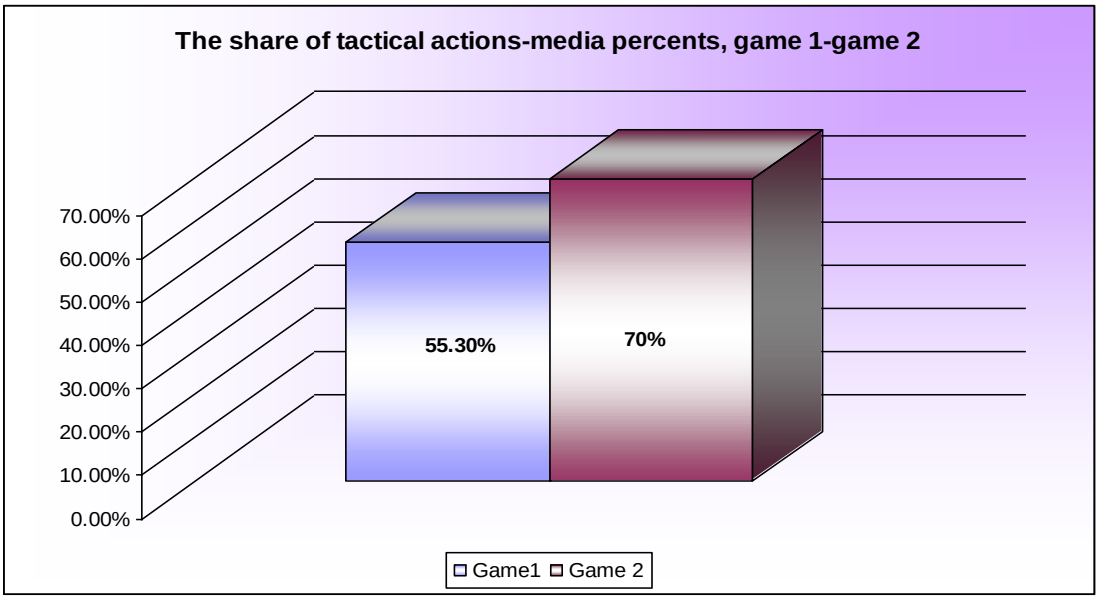
N° game	Throws at 9m	Throws at 6m	Outrunnings	Crossings	Blockings	Circulation	Media percents
1	76%	84%	60%	32%	64%	16%	55.33%
2	88%	92%	76%	64%	72%	28%	70%

We notice that, at the first game without a special physical and technical training, the total share of a individual and collective tactical actions, was 55,33%, and in the second game the total share of individual and collective tactic actions was 70% , a progress being of 14,67% .

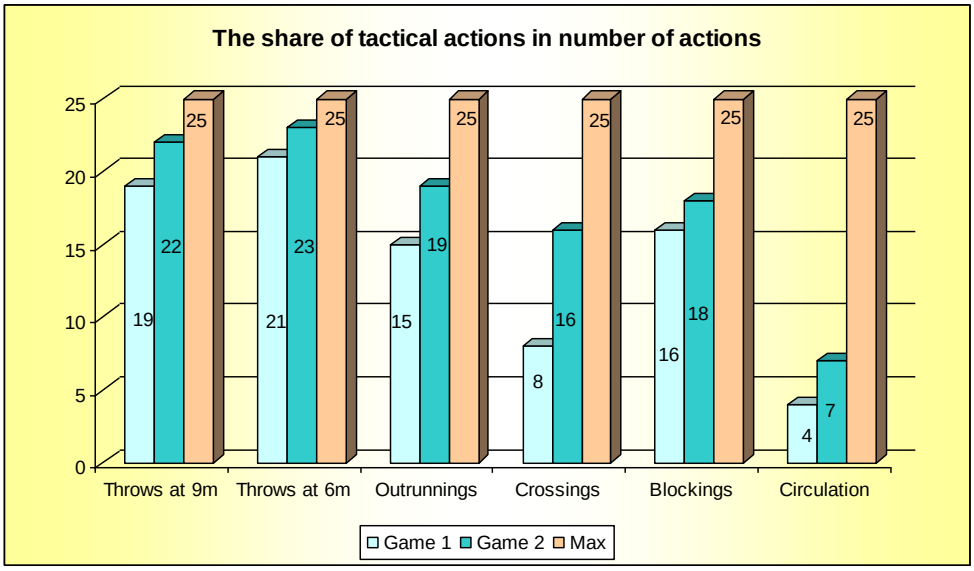
Graphic 1



Graphic 2



Graphic 3



Conclusions

After studying and interpreting the results recorded in case report forms, we see that from practical approach made tactical actions and collective share, visibly increased from first to last official game, so the hypothesis has been verified and attained.

One can say that tactical training can not be effective without rigorous physical training and technique performed.

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CONTRIBUTIONS OF SHARES OF GAME DEVELOPMENT IN DEFENCE EFFICIENCY IN AREAS BY THE SPECIALIZATION, THE NATIONAL VOLLEYBALL TEAM JUNIOR OF ROMANIA

COJOCARU ADIN MARIAN[1], COJOCARU MARILENA[1]

Abstract

Contextually optimization and for the enlargement of the efficiency training the players for the game of defense needs as this to is reflective and structure on the strength of the act of model, in which find a logical relation between strategists, objectives, contained and evaluation.

We can assert that in the current volleyball the preparation for defense is a major preoccupation specialists, and contained this is found out in a permanent evolution and perfecting.

In this research we aimed to establish the training objectives of junior national team in the game to increase efficiency and adapt their teaching methods, methodological processes, operating systems and evaluate activities play in terms of effective competition

Research hypotheses

1. Players specialize in playing at the net, may be more effective in making the jam, but this does not ensure effective defense of all actions, based on service and taking the attack, structural relationship with attack actions - service, setting and attack;

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Received 17.05.2012 / Accepted 18.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

2. Only by applying structural methods and specific action game in attack and defense, connected to the line players I and II, could lead to increased efficiency in the game, considering that the actions of defense are critical the achievement points.

Research Methods:

The method of study bibliographic; the method observation; the method analogy and modeling; experimental method; recording method specific effectiveness of the game; statistical and mathematical method; the graphic method.

Data processing method

Thus the result of each action is evaluated using a scale of 4-5 degrees, depending on the action of defense, in connection with the attack, based on the effect on the score or control the ball by the team after playing the ball or the opponent (1992, *Manual for Statistical Games Record. FIVB)*. The assessment was made as follows:

- ✓ *As* - 4 – point win;
- ✓ *Excellent* – 3 – gained full control, maintained;
- ✓ *Good* – 2 – gained limited control limitat, maintained;
- ✓ *Insufficient* – 1 – lost control, no control;
- ✓ *Wrong* – 0 – lost point.

Conclusions

In summary, the actions of defense, the major objective in our research are relevant to the amendment that is appropriate for volleyball athletes to specialize on positions and field team

Key words: efficiency, skills, game, volleyball.

Introduction

Component favoring a volleyball game - defense contribute to optimize performance capacity. Junior training approach should be ensured in the context of exclusion of confusion and improvisations that occur, the massive tackle more effectively the actions of defense. The main task of a volleyball player is channeled to anticipate arrival of the stimulus, the movement and ball speed adjustment. aspect is further complicated by the athlete relationship partner, who sent the ball and for that you need to send and opponent intervention. in relation to the player with the ball movement begins before contact with it and adjust collision, according to the situation. prediction involves forecasting space-time, providing acceleration perception and response. (M. Şerban, 1999).

In the context of optimization and improve efficiency of training players to play defense is necessary that it be reconsidered and structured modeling based action, in which lies a logical relationship between strategies, objectives, content and evaluation (M. Ioniţă, 2007).

Proposed overall goal requires a strategy to

increase efficiency drive actions to defend a specific position in the team training and evaluating the effectiveness of this strategy (V. Ghenadi, 1995). Also in the research, I worked from the beginning on making a scale of defense specific actions for each post within the team, depending on the weight of their use and their effectiveness in the game. In this research we aimed to establish the training objectives of junior national team in the game to increase efficiency and adapt their teaching methods, methodological processes, operating systems and evaluate activities play in terms of effective competition (T. Bompa, 2003)

Hypotheses research

1. Players specialize in playing at the net, may be more effective in making the jam, but this does not ensure effective defense of all actions, based on service and taking the attack, structural relationship with attack actions - service, setting and attack;

2. Only by applying structural methods and specific action game in attack and defense, connected to the line players I and II, could lead to increased efficiency in the game, considering that the actions of defense are critical the achievement points.

Research methods

- bibliographic study method;
- observation method;
- modeling and analogy method;
- experimental method;
- registration method;
- statistical-mathematical method;
- graphic method.

Data processing method

Technical and tactical skills of players can be determined by analyzing the behavior of athletes during the games. Competitor activity peak of the events of his efforts in these conditions and so we believe that records technical and tactical actions contribute to a better analysis and evaluation of training athletes.

Thus the result of each action is evaluated using a scale of 4-5 degrees, depending on the action of defense, in connection with the attack, based on the effect on the score or control the ball by the team after playing the ball or the opponent. The assessment was made as follows:

- ✓ *Ace* - 4 – point win;

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

✓ *Excellent* – 3 – full control of the ball, maintained;
✓ *Good* – 2 – limited control of the ball, maintained;
✓ *Insufficient* – 1 – lost control, no control;
✓ *Wrong* – 0 – point lost.

"Ace" (evaluated 4) is used just for actions: serve, attack and block.

"Full control" (evaluated 3) is used when building created possibilities for further rally.

"Limited control" (evaluated 2) is used when preparing further attacks cannot be achieved using all options.

"No control" (evaluated 1) is used where building attack is possible, however the ball remains in play.

Interpretation of results

In this study we present the evolution of the effectiveness of the game depending on job specialization, every competition included in our research.

Action game defending the high post, was made by T. E. (table 1).

Table 1 Efficiency defensive actions

Center player 1	Block
Balkan Championships Serbia	0.2
Balkan Championships Grecia	0.23
European Championship Romania	0.2
Balkan Championships Turkey	0.275
Average national team	0.226
World Championship	0.43

For our research, game specific game actions in defense of linkage were blocking the line of attack and taking him in line II.

Blockage index recorded a very low (mean batch was 0.232), if we refer to the index World Championship (0.43). Tried to increase the efficiency index, which is achieved through education and training in the range of BC in Serbia and Turkey, with one exception in EC (0.15), the preparation time was reduced.

If there was a line Take indicate better efficiency, the acquisition of second-line attack efficiency index was excellent (0.565) exceeded the international (0.452). We could say that the actions of the linkage line II tried to substitute less successful actions of the blockade, which is noted throughout the game.

Below we present three athletes who have played the main station or player from the center drawer. They are intended primarily for defense only block execution. After execution of the service is changed in line II libero player, which the duties of defense

Table 2 Blocking efficiency of the center player 1

Setter	Reception from attack	Block
Balkan Championships Serbia	0.611	0.217
Balkan Championships Grecia	0.567	0.27
European Championship Romania	0.5	0.15
Balkan Championships Turkey	0.58	0.29
Average national team	0.565	0.232
World Championship	0.452	0.43

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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Table 3 Blocking efficiency of the center player 2

Center player 2	Blocaj
Balkan Championships Serbia	0.354
Balkan Championships Grecia	0.622
European Championship Romania	0.428
Balkan Championships Turkey	0.494
Average national team	0.475
World Championship	0.43

Table 4 Blocking efficiency of the center player 3

Center player 3	Blocaj
Balkan Championships Serbia	0.4
Balkan Championships Grecia	0.26
European Championship Romania	0.38
Balkan Championships Turkey	0.29
Average national team	0.333
World Championship	0.43

An essential part of modern volleyball game-high drawer is known by many names as universal or diagonal of setter.

It can be observed (Table 5) that the taking of office is near the average lot in CW (0.768 şi 0.788).

Being realistic, taking the service has these indices increased efficiency, but it is made from fewer actions game lifting the drawer. It aims, in line II, to prepare to create their own team's superiority in the attack, an attack by a second line. In these circumstances he did not participate in taking the service than by accident.

Table 5 Efficiency defensive actions of universal player

Universal player	Reception of service	Block	Reception of attack
Balkan Championships Serbia	0.791	0.15	0.773
Balkan Championships Grecia	0.771	0.367	0.333
European Championship Romania	0.733	0.275	0.692
Balkan Championships Turkey	0.775	0.321	0.522
Average national team	0.768	0.278	0.58
World Championship	0.788	0.43	0.452

Station with the most specific defense action game is the second shot or extreme player. The position in which there is action game play of both structures, namely taking the service of a play structure and blocking the acquisition of specific attack 2 game structure.

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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Table 6 The efficiency defensive actions of extreme player

Extrem player 1	Reception of service	Block	Reception of attack
Balkan Championships Serbia	0.464	0.178	0.4
Balkan Championships Grecia	0.731	0.333	0.375
European Championship Romania	0.709	0.25	0.429
Balkan Championships Turkey	0.405	0.35	0.455
Average national team	0.577	0.278	0.415
World Championship	0.788	0.43	0.452

Tabelul 7 The efficiency defensive actions of extreme player

Extrem player 2	Reception of service	Block	Reception of attack
Balkan Championships Serbia	0.5	0.538	0.688
Balkan Championships Grecia	0.714	0.31	0.813
European Championship Romania	0.7	0.38	0.75
Balkan Championships Turkey	0.674	0.34	0.61
Average national team	0.647	0.392	0.715
World Championship	0.788	0.43	0.452

We note that the assumption of office, has an average age corresponding to the CM., 0647 to 0788. The highest index of efficiency was achieved at JB in Greece, 0714. A great show was made and the EC 0.7 Lock (0392) we can say that is near the 0.43 international, especially if we consider that he was as old cadet.

Taking the attack is similar to the indices of efficiency of international elite (0715) of the CW and is the largest of our group. We notice an efficiency index to BC particularly in Greece, 0813, which entitles us to believe that this player will have a difficult word to say to the world of volleyball players.

Last post is the libero, which is strictly defensive regular and singular on the scoresheet.

Table 8 The efficiency defensive actions of libero player

Libero player	Reception of service	Reception of attack
Balkan Championships Serbia	0.617	0.654
Balkan Championships Grecia	0.673	0.667
European Championship Romania	0.639	0.571
Balkan Championships Turkey	0.803	0.625
Average national team	0.683	0.629
World Championship	0.788	0.452

Libero the nature of the job, but the regulation is prepared and specialized defense actions (Table 8) and he coordinates the defense system, giving security defense system.

Taking the service (0683) is close to that recorded in CW (0788), but also a great show at the 0803 BC Turkey, more than the international average.

Taking the attack (0.629) is above that of the CM, as constant, with the only loss to EC 0.571. We see that the efficiency index of this action is the 0.629 game at all international competitions in which I participated and entered the international elite values.

Looking at the average lot for the attack made by the player taking extreme RT and CT libero, we can

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
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say, without any mistake that the positions where both are in line II, the defense system has a very good index, which construction that would certainly attack.

In summary, the actions of defense, the major objective in our research are outlined in Table 9. Average takeover of our lot and block service is the best at BC in Greece, of 0.67 and 0.301, with relatively small differences from those of the WC, both of 0.157, the team is made up of cadets and juniors. The highest values recorded attack took over from the 0.563 to BC, as the higher of the 0.052 CW. However we consider achievements, considering that our preparation conditions are poor and compensate training methodology, supported by an ongoing assessment of training and games.

Table 9 The efficiency defensive actions

Competition	Reception of service	Block	Reception of attack
Balkan Championships Serbia	0,712	0,217	0,489
Balkan Championships Grecia	0,670	0,301	0,551
European Championship Romania	0,559	0,285	0,412
Balkan Championships Turkey	0,582	0,289	0,563
Average national team	0,631	0,273	0,504
World Championship	0,788	0,43	0,452

Conclusions

Setters - specific game actions are blocking the game from the defense line of attack on him and taking the second line:

⇒ blockage index recorded a very low (average value of the lot was 0232), if we refer to index of the CM 2006 (0.43);

⇒ the reception from attack of second-line attack efficiency index was excellent (0.565) exceeded the international (0.452) and we can say that the actions of the linkage line II tried to substitute less successful actions of the blockade, which noted the whole.

Universal (zone 2) - specific game actions are blocking the game from the defense line of attack on him and taking over the second line:

⇒ the block, we see a pretty big difference to the CM, especially in games at BC in Serbia, almost nonexistent 0.15 and the EC, with an index of 0.275, and an increase in Greek BC (0.367) and Turkey (0.321);

⇒ taking over the attack, except Balkan Olympiad in Greece (0333), all other indices are above the average CM and the general have an average of 0.58 from 0452 to CM 2006 and we can say that we must put in perspective, focus on specific training in blocking, since the taking over of attack methodology is used efficiently.

Centers players (zone 3) - specific game actions are blocking the game from defense in first line:

⇒ can see an index of efficiency almost half the international 0.226 to 0.43;

⇒ best result we can see that JB was in Turkey, 0.275, where the training period was longer, but accumulated over previous periods have left their mark;

⇒ given that age is still small and great height, falling within the CM maximum waist, action on muscle growth and development active explosive strength and speed and should take a decision if the coaches would not be appropriate for the game to be transformed in extreme (zone 4).

Extreme players (zone 4) - game specific game actions are defending him and block the reception of the service line and second-line attack:

⇒ reception of service has an index of efficiency in 0577, under the International, which is 0788 and but two competitions in Greece JB (0731) and EC (0709) efficiency index was close to the international;

⇒ block is the same limitations as all players, with an average of 0.278 to the WC of 0.43, which is encouraging is that efficiency has increased since the first competition (0.178) with a maximum last, BC Turkey (0.35), considering that the training methodology was adequate and appropriate level;

⇒ the reception from attack has an average of 0.415, close to the 0.452 international, but also a competition in which the values exceeded the WC and BC namely Turkey, with an efficiency index of 0.455.

Libero - specific game actions are taking over game in defense and attack from the service in second:

- ⇒ reception from service (0683) is close to that recorded in CM (0788), but also a great show at JB in Turkey 0803, more than the international average;
- ⇒ is above that of the CM, as constant, with the only loss to EC 0.571;
- ⇒ we can say that this efficiency index is the 0629 action game in all competitions attended and entered the international elite values.

Average taking over of our lot and block service is the best at JB in Greece, of 0.67 and 0.301, with relatively small differences from those of the CM, both of 0.157, the team is made up of cadets and juniors. The highest values recorded at the taking over of the JB attack in Turkey 0.563, more than those of CM-as with 0.052. In terms of sports results can be seen an increase in competition to another, from a VI place in Serbia in the Balkan Championship and third place finish in Turkey and the Balkan of Romania ranked second. However we consider achievements, given our training conditions are poor and compensate training methodology, supported by a continuous assessment of training and games.

In summary, the actions of defense, the major objective in our research are relevant to the amendment that is appropriate for volleyball athletes to specialize on positions and field team.

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THE COMPARISON OF AGGRESSION OF FOOTBALL PLAYERS IN DIFFERENT POSITIONS

DEHGHANI MAHROKH[1], BEHTAJ AYOUB[1]

Abstract

Purpose. Aggression is a negative personality trait that has been associated with sport participation. From a psychological perspective, aggression has been defined according to Baron's (1977) conceptualization of aggression as any physical, mental or verbal behavior driven by the intent to harm someone who is motivated to avoid such treatment. Because of the impact of aggressive behavior on athletic performance, the purpose of this study was the comparison of aggression of football players in different positions.

Methods. A total of 138 male football players completed the surveys. Two kind of personal information and Bredmeier Athletic Aggression Inventory were used to collect the information. In order to analyse the data was used ANOVA.

Results. There was a significant differences between different positions for the hostile aggression.

Conclusions. These results could be useful in any future attempts to predict and control aggressive behavior by coaches and sports psychologists.

Key words: Aggression, Football player , Position.

Introduction

Aggression is perhaps one of the most important problems in sports today (D.N. Sacks, Y. Petscher, C.T. Stanley, G. Tenenbaum, 2003). Much research has looked at aggressive behaviors in sport, trying to understand the processes underlying such an unethical behavior (B. Kirker, G. Tenenbaum, J. Mattson, 2000; D.E. Stephens, 2001; G. Tenenbaum, E. Stewart, R.N. Singer, J. Duda, 1997).

Aggression is a negative personality trait that has been associated with sport participation (L.A. Keler, 2007). The term aggression has been defined by R.A. Baron and D.R. Richardson (1994) as —any form of behavior directed toward the goal of harming or injuring another living being who is motivated to avoid such treatment" (p.7). Aggression is physical or verbal behavior; it is not an attitude or emotion(M.A. Mattesi, 2002).

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Received 15.08.2011 / Accepted 18.10.2011

According to a number of theorists (B.J. Bredemeier, 1985; J.M. Silva, 1980), aggression is divided between instrumental and reactive aggression. Instrumental aggression consists in causing a strategic nuisance to an opponent in a desire to hinder one's performance, such as a box out in basketball or a legal body check in hockey. Contrary, reactive aggression usually involves frustration or anger along with the intent to harm or injure another.

The primary goal is the resultant pain or suffering of the victim. Therefore, the focus of reactive aggression is to hurt one's opponent even to the point where the injured athlete must be removed from the game. A similar definition was adopted by R.A. Baron and D.R. Richardson (1994) who operationally defined aggression in sport as '. any form of behavior directed toward the goal of harming or injuring another living being who is motivated to avoid such treatment (p0.7)'.

According to this definition, behavior may be verbal or physical and must be directed at another person rather than an inanimate object, for example throwing one's racket to the floor or kicking one's chair on his way to the bench would not be categorized as aggressive behavior, rather, they would be signs of frustration and anger (G. Eric, 2009).

Aggression in sport is commonplace(Bredmeier & Shields, 1986). Sports such as ice hockey, boxing, and football usually tend to be socially acceptable channels for aggression (M.A. Mattesi, 2002).

A large number of studies have been conducted examining aggressive behavior in the sporting context.

Although the results have been equivocal, the view of sport psychologists has been that aggressive behavior is negative, morally unacceptable, and may lead to decreased performance (M.D. Smith, 1983; J.C.H. Jones, D.G. Ferguson, K.G. Stewart, 1993).

The majority of these studies have found inconsistent results due to differences in definitions of aggression and various methodological approaches such as using archival data, self-report instruments, or direct observation (N.J. Brown, 2000).

There have been several theories proposed to explain the phenomenon of human aggression. The majority of these theories can fall into one of four categories: catharsis theory, instinct theory, frustration-aggression theory, and social learning theory (N.J. Brown, 2000).

A popular theory explaining aggression is the Revised Frustration-Aggression Theory (Berkowitz, 1965). This theory consists of aspects from A. Bandura's (1973) Social Learning Theory and Smith's (1972) theory on frustration and aggression. Berkowitz proposed that either frustration or another stimulus (e.g., threat) increases a person's arousal and anger levels, which increases one's readiness to aggress.

However, aggression will only occur if the person has learned the appropriateness of such behavior in that specific situation. In other words, aggression not only depends on the strength of the association between the situation and aggressive behavior, but also the degree of readiness to aggress and the presence of aggressive cues (Berkowitz).

This easily generalizes to the sport socialization process.

During an athletic contest, the potential for a frustrating situation is unlimited. Combine that with aggressive behavior that is rewarded by teammates, coaches, and parents, or vicariously learned from role models on television or during live contests, and the potential for aggression in sport rises exponentially (L.A. Keler, 2007).

Player position is a variable that has received very little empirical attention (W.N. Widmeyer, J.S. Birch, 1979). Little or no research has examined the relationship between field position and the occurrence of aggressive acts, and none specifically the sport of football. Again from a frustration-aggression theory standpoint, it would be acceptable to predict that aggressive acts would be more likely to occur when teams are either in their offensive or defensive zones, as opposed to the neutral zone of the field.

When attacking or defending their goal line, frustration could be at its highest as the team tries to score or stop the opposition scoring, as both situations involve the opposition trying to deny the team the goal of winning (through preventing the team scoring, or by the opposition scoring themselves).

This frustration combined with the close proximity of the goal line would serve to heighten emotions and possibly increase the chance of aggressive behavior occuring (N.J. Brown, 2000).

The general view of sport psychologists and a large number of the general public is that aggressive behavior in sport is morally unacceptable and should be eliminated. When considenng the relationship between aggression and performance, there are several factors to consider (N.J. Brown, 2000).

On an individual basis, aggressive behavior, acçording to the cathartic theory, may result in decreased tension, which possibly could lead to improved performance. Similarly the heightened physiological arousal associated with aggressive behavior has the potential to either be beneficial or detrimental to performance, based on the individuals interpretation of this arousal. in the team sport context, aggressive

behavior can act as a double-edged sword (N.J. Brown, 2000).

Aggressive behavior may cause a disruption to the thoughts and actions of teammates, and if the act is punished by officials, can result in a disruption in play (affecting the focus and attention of team-mates), possible punitive action (receiving a penalty or being scored against), or having to play with one less player if the offender is sent off. Conversely, aggression can act as a rally cal1 for teams. A bench clearing brawl involving al1 the players on a team could result in increased feelings of group solidarity and cohesiveness among team-mates which could transfer to improved performance on the field (J.P Brunelle, C.M. Janelle, L.K. Tennant, 1999).

As the majority of research conceming aggression in sport is equivocal, there are no definitive answers relating to the relationship with performance. Further research, involving standardized operational definitions and research methodologies is required to fully explore and understand this area of sport psychology (N.J. Brown).

Because of the impact of aggressive behavior on athletic performance, the purpose of this study was the comparison of aggression of football players in different positions.

Method

A sample of 138 male football players, consisting of males (age 23.75±3.51years old; body height 177.72±6.73 cm and body weight 74.68±12.77kg) are selected randomly from the statistical population of in league competition class two in Iran.

Measures:

Demographic variables. Participants completed a demographic information section, which included questions on age, weigth, height, field position in football, team ranking in league, weekly hours they engaged in football, and the number of years they had been playing football. Participants were grouped according to their field position: defender(n=32), halfback(n=58), forward(n=22) and goalkeeper(n=26).

Sport aggression. The short form, the BAAGI-S (Bredemeier, 1975), has 15 hostile and 15 instrumental items. Items are answered on a 4-point

Likert scale ranging from 1 = "strong agreement" to 4 = "strong disagreement." Lower scores represent higher levels of aggression for each subscale. However, during the present investigation, scores were reversed so that higher scores would indicate higher levels of aggression.

Also in this study was compared aggression between successful team (top two team) and unsuccessful team(bottom two team in league competition). Demographic data was presented by descriptive statistics. Aggression of players in different field position was compared by ANOVA test.

A independent t-test was applied to compare aggression between successful and unsuccessful teams. Analysis was performed using SPSS 18.

Results

One hundred and thirty-eight football players were grouped according to their field position. Table1 shows the means and standard deviations of age, body height and body weight of players in different field positions. Goalkeepers were bigger than other players.

Table2 presents the means and standard deviations of hostile aggression and instrumental aggression of players in different field positions. The results of variance analysis of comparing groups in aggression variable (table 3) showed that there was a significant difference among hostile aggression of football players in different positions , but there was not a significant difference among instrumental aggression of football players in relation to play position.

The results of LSD test showed that in the variable "hostile aggression" there was a significant difference between goal keepers and forward players ($P<0.000$), goal keepers and halfback players ($P<0.001$), goal keepers and defender players ($P<0.003$) and also between forward players and halfback players ($P<0.049$). In other words the rate of "hostile aggression" in the goalkeepers was much more than other groups. After goal keepers the players of defense and at the end there were the players of forward.

Forward < backward = halfback < goal keeper

In this study, for the examining effects of aggression on sport performance, we also compared aggression betweem successful and unsuccessful teams in leage. Table 3 presents the means and standard deviations of hostile aggression and instrumental aggression of players in successful and unsuccessful teams. The result of t-test analysis showed that there was significant difference between successful and unsuccessful teams in hostile aggression as unsuccessful teams had higher scores in this variable.

Discussion and conclusion

The aim of the present research was to comparing aggression of football players in different field positions. Also, İn this study we compared aggression between successful and unsuccessful teams.

The results of first study showed that the aggression of goalkeepers is more than others group. There are little reviews concering aggression in different field position specifically the sport of football. An analysis by Brown of teams competing in the 1999 Rugby World Cup tournament

revealed that aggressive behavior occured more in the neutral zone of the field, compared to the attacking or defensive zones (N.J. Brown, 2000).

In another study, Secunda, Michael D reported more aggression in players of defense and halfback in football (M. D. Secunda, 1986). With respect to behavioural repertoires, W.N. Widmeyer, J.S. Birch (1979) found that defensemen committed significantly more aggressive penalties than did their offensive counterparts.

C. Gee (2004) indicated no significant difference between the number of aggressive acts committed by defensive and offensive players.

The difference between these studies can be partially explained according to the criteria necessary to illicit a penalty (C. Gee, 2004).

On the other hand the cause of inconsistency can be expressed because of differences in methodology(archival data, self-report instruments, or direct observation), sports, age and the experience of the players.

İn this study high rates of hostile aggression in goalkeepers and then defense players can be expressed in being critical situations.

J. Vallance et al (2006) found that Critically situations or situations that are perceived crisis from outcome, are associated with emotional responses (expression of anger and aggression). The other reason could be larger body size of goalkeepers and then players of defense (P. Lemieux, 2002).

The present findings demonstrated that unsuccessful teams had higher scores than successful teams for hostile aggression. This results are consonant with studies of J.M. Silva (1980), E.J. McGuire et al (1992).

Volkamer (1971) found that lower level teams were more aggressive than higher and moderately ranked teams. J.M. Silva (1980), in a field experiment, found that subjects who exhibited aggressive behavior and were thus behaviorally aroused, showed poorer performance than did subjects who did not exhibit aggressive behavior. J.M. Silva (1980) also noted that subjects who aggressed had lower concentration levels than did those who did not aggress.

The findings of this study is in contrast to N.J. Brown 2000 and M.L. Sachs, 1978. N.J. Brown, 2000, with comparing assertive and aggressive behaviors between successfùl and unsuccessf teams, found significant differences for assertive acts but not for hostile and instrumental aggressive acts. Successfùl teams had significantly greater assertive acts (M=145.58) than the unsuccessful teams (M=83.29).

Our study showed that players of unsuccessful team were more aggressive.The reason can be expressed as aggressive behaviors distract the attention of aggressive person and going beyond one`s level of arousal from optimal. Therefore arousal, which generally accompanies aggressive behavior, could interfere with performance (J.M. Silva, 1980).

These results could be useful in any future attempts to predict and control aggressive behavior by coaches and sports psychologists. As aggresson is result from heightened arousal levels, incorporating some arousal control techniques such as relaxation breathing or centering into **training** may **help** players maintain physiological and psychological arousal at a beneficial level.

Table1- the means and standard deviations of age, body height and body weight of players in different field positions

Field position	N	Age	Body height	Body weight
Goalkeeper	26	23/31 ±3/33	184/31 ±4/48	77/08 ±6/79
Forward	22	24/00 ±3/00	176/20 ±5/75	72/80± 7/37
Halfback	58	23/86 ±3/90	174/55 ±5/89	74/28 ±18/32
defender	32	23/75± 3/51	179/06 ±6/42	74/60± 5/15
total	138	23/75 ±3/51	177/72±6/73	74/68 ±12/77

Table2- The means and standard deviations of hostile aggression and instrumental aggression of players

Field position	N	Hostile aggression	Instrumental aggression
Goalkeeper	26	44/22±9/11	43/44±3/64
Forward	22	29/71±3/73	49/28±5/42
Halfback	58	35/09±5/75	44/57±5/22
defender	32	35/30±4/57	47/70±4/76
total	138	36/08±7/38	45/72±5/18

Table3- the means and standard deviations of hostile aggression and instrumental aggression of players in successful and unsuccessful teams

Aggression ……..team ranking	N	mean	Standard diviation
Hostile aggression …….. Successful team	18	34/333	5/606
... ……...……...Unsuccessful team	21	39/733	8/224
Instrumental aggression…… Successful team	18	45/867	6/057
……..……...…….…...Unsuccessful team	21	46/761	4/194

Table 4- The result of t-test analysis between successful and unsuccessful teams in hostile aggression and instrumental aggression

Aggression Variable		**Leven Test for Variance Equal**		**T_Test for Mean Equal**			
		F	**Sig.**	**t**	**df**	**Sig.(2-tailed)**	**Mean difference**
Hostile Aggression	Variances Equal is assumed Variances Equal is not assumed	4.320	0.045	2.346 2.2.3	37 20.906	0.025 0.038	5.400 5.400
Instrumental Aggression	Variances Equal is assumed Variances Equal is not assumed	4.895	0.034	-0.525 -0.494	37 36.192	0.603 0.626	-0.895 -0.895

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

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THE EFFICIENCY OF THROWING AT THE GOAL PROCEDURES AT THE LEVEL OF WOMEN HANDBALL TEAMS - SENIORS

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Abstract

Male and female handball in Romania is considered a sport with an exceptional track record over time, both nationally and internationally. Many handball athletes have made history in this sport both through their results and the fact that at some point they have contributed to improving the throwing procedures at the gate, effective procedures that today carry their names.

Purpose: This paper is a study that deals with determining the most effective disposal methods used by athletes from C.S.M. Ploiesti in handball matches, played in the championship.

Methods: Research methods used during the research were: method records, statistical and mathematical method, bibliographic documentation method, pedagogical observation method.

Conclusions: from the study that I conducted on female team handball senior at C.S.M. Ploiesti, I noticed that it was emphasized the throwing at the goal from the jump and from plunge. The most effective team player who played in every game was J_1 who plays inside left with 89 goals.

Suggestions: From the made study I believe some proposals for improving the efficiency of throwing at the goal procedures are imposed by taking the following measures:

- The coach to devote more time to prepare the team in terms of effective throwing at the goal of players;
- The development of exercises specific to throwing the goal from posts;
- The execution of throws at the goal by the main post specific techniques to exhaustion, etc..

Key words: throwing at the goal, procedures, efficiency.

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Introduction

Handball as a sport branch, is considered to be the newest of classic sports games, having originated in Europe, specifically in the northern part of it. At its beginnings, under the influence of other team games, it was played in 11 players, held outdoors, today being currently played in seven players, in the gym only (I.K. Ghermănescu, et al., 1983*)*.

Over time Romanian handball players have progressed to throw at the goal, so that these processes carry their names today. Such a course would be to Maricel's Voinea, "Voinea effect", which is a thrown with effect, by which the thrown ball, coming into

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Received 10.05.2011 / Accepted 13.08.2011

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

contact with the floor, will go around the keeper. For this process the player can benefit from a very small space of handling. This is a spectacular and effective throw with which plenty of goals were scores from all positions but especially from the extremes (P. Cercel, 1983).

Another method is throwing at the goal by evasion which was first made by Virgil Hnat. This process consists in throwing at the goal from avoidance, initially the striker threatens the

goal perpendicular on the defender, this is followed by a bending towards right or left avoiding thus the blocking of the defender, completed by a shot on the goal. Vasile Stângă remained in history as the man who first made "the floating" (C. Hantau, 2009). This execution is a high jump, and maintaining it as much as possible making such a floating, an optical illusion. The number of throwing procedures is much higher, they being subject to the attack phase in which they are performed, the position of goalkeeper, of the defender confronted with the striker that makes the throw. In the present study were tracked, analyzed and recorded in order to establish an optimal level of efficiency the following throwing procedures at the goal: throwing at the goal by plunge, bounce, near the hip, from support, from running (I. Bota, 1984)

First and last name	Throwing at the goal from jump		Throwing at the goal from running		Throwing at the goal from support		Throwing at the goal from plunge		Throwing at the goal from hip		The 7 m throw		Throws	Total goals	Efficiency
	Goal	Miss	Goal	Miss	Goal	Miss	Goal	Miss	Goal	Miss	Goal	Miss			
J_1	39	32	7	7	7	15	10	2	3	1	18	6	147	84	57,14%
J_2	19	5	0	1	0	0	14	5	0	0	2	1	47	35	74,46%
J_3	2	5	1	0	2	1	3	1	0	0	0	0	15	8	53,33%
J_4	26	25	6	4	9	7	18	4	7	10	1	1	118	67	56,77%
J_5	6	6	2	0	1	1	26	16	0	0	2	1	61	37	60,65%
J_6	21	14	3	0	3	1	10	2	0	0	0	0	54	37	68,51%
J_7	1	0	0	0	0	0	0	0	0	0	0	0	1	1	100%
J_8	6	0	1	0	1	0	5	2	0	0	0	0	15	13	86,66%
J_9	3	2	0	0	0	0	3	2	0	0	0	0	10	6	60%
J_{10}	0	1	2	0	0	0	3	2	0	0	1	0	9	6	66,66%
J_{11}	0	0	0	0	1	0	1	0	0	0	0	0	2	2	100%
J_{12}	3	1	0	0	0	0	0	0	1	0	0	0	5	4	80%

Table 1. *Records were centralized*

Research premises

In this paper we track the effectiveness of various methods of throwing at the goal used by players in the game of handball. The women athletes subject to investigation are representative for the category they belong to. The team is homogeneous in terms of training and the players participate with 100% of their capacity in this competition.

Research organization

To perform this study we followed and studied the effectiveness of various methods of throwing at the goal used by the players from C.S.M. Ploiesti, team that is representative of the echelon of which it forms part. The data recording was made after watching the matches in women's handball National League and after consulting the statistics under the competition sites, [www.frh.ro].

Research data

The data we have obtained with the game sheets and videos were exposed through the tables for each game in part. Throws at the goal have been tracked by various methods at the girls team of C.S.M Ploiesti.

Research methods used

The records method: Records results with variable values were centralized through the game sheets and video camera and exposed in this paper with the help of tables for each game.

Statistical-mathematical method: data obtained were entered into tables and centralized. At every match it has been established the number of goals scored by different methods of throwing from a total number of throws at the goal. Bibliographic documentation method: in performing this study we used several methods and research techniques. In order to study the theoretical foundations of the paper we studied the specialty materials and materials from other areas. Pedagogical observation method: knowing the potential of the sample of which the team that conducted the study is part of, we appealed to a pedagogical study. This study was conducted on the senior team of C.S.M. Ploiesti that has evolved into A Division in the competitive year 2010 - 2011. Recordings were made during eight matches, held at home and away. Records were centralized in the table below.

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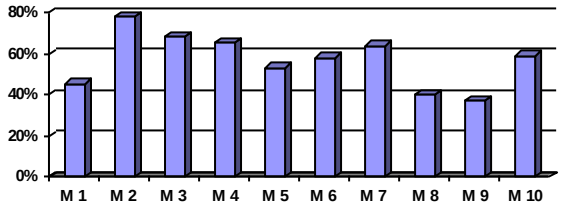
Data interpretation

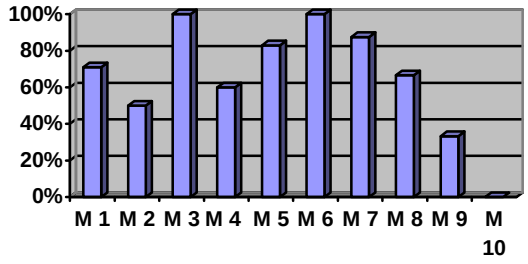
J_1 played on the inside left position. She had a total number of 147 throws at the goal and scored 84 goals, having an efficiency of 57,14%. Her favorite procedure was throwing at the goal from jumping, with which she scored a number of 39 goals from 71 throws, by throwing at the goal from running she scored 7 goals from 14 throws, by throwing at the goal from support she scored 7 goals from 22 throws, by throwing at the goal from plunge she scored 10 goals from 12 throws, by throwing at the goal from the hip she scored 3 goals from 4 throws, and from the 7m throw she scored 18 goals from 24 throws (figure 1).

Figure 1. *The efficiency degree of the throws at the goal of the player's J_1*



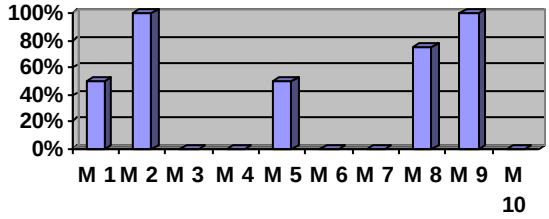
J_2 played on the extreme left position. She had a total number of 47 throws at the goal and scored 35 goals, having an efficiency of 74,46%. The favorite procedure was throwing at the goal from jumping with which she scored 19 goals from 24 throws and throwing at the goal from plunge with which she scored a number of 14 goals from 19 goals, and by the 7m throw she scored 2 goals from 3 throws (presented in figure 2).

Figure 2. *The efficiency degree of the throws at the goal of the player's J_2*



J_3 played on the pivot position. She had a total number of 15 throws at the goal and scored 8 goals, having an efficiency of 53,33%. Her favorite procedures were: throwing at the goal from running with which she scored 1 goal, throwing at the goal from support with which she scored 2 goals from 3 throws, throwing at the goal from plunge with which she scored 3 goals from 4 throws (presented in figure 3).

Figure 3. *The efficiency degree of the throws at the goal of the player's J_3*



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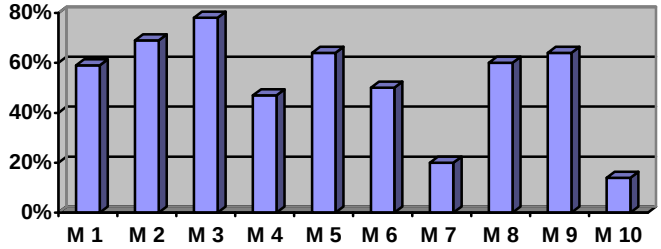
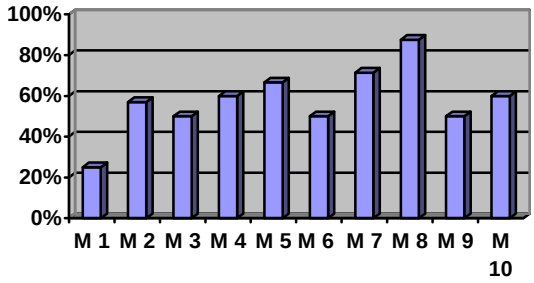
J_4 played on the position of game coordinator. She has a number of 118 throws at the goal and scored 67 goals, having an efficiency of 56,77%. Her favorite procedure was throwing at the goal from jumping with which she scored a number of 26 goals from 51 throws and through: throwing at the goal from running she scores a 6 goals form 10 throws, throwing at the goal from support she scored 9 goals from 16 throws, throwing at the goal from plunge she scored 18 goals from22 throws, throwing at the goal near the hip she scored 7 goals from 17 throws and by the 7m throw she scored 1 goal from 1 throw (presented in figure 4).

Figure 4. *The efficiency degree of the throws at the goal of the player's J_4*



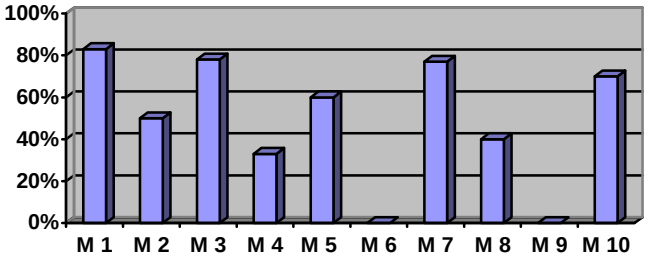
J_5 played from the extreme right position and had a total number of 61 throws at the goal and scored 37 goals, having an efficiency of 60,65%. Her favorite procedure was throwing at the goal from plunge with which she scored a number of 26 goals from 42 throws, by throwing at the goal from jumping she scored 6 goals from 12 throws, by throwing at the goal from running she scored 2 goals from 2 throws, by throwing at the goal from support she scored 1 goal from 2 throws and by the 7m throw, 2 goals from 3 throws (presented in figure 5).

Figure 5. *The efficiency degree of the throws at the goal of the player's J_5*



J_6 played form the position of intern right and had a number of 54 throws and scored 37 goals having an efficiency of 68,51%. The used procedure was throwing at the goal from jumping by which she scored 21 goals from 35 throws, by throwing at the goal from running she scored 3 goals from 3 throws, by throwing at the goal from support she scored 3 goals from 4 throws and by throwing at the goal from plunge she score 10 goals from 12 throws (presented in figure 6).

Figure 6. *The efficiency degree of the throws at the goal of the player's J_6*



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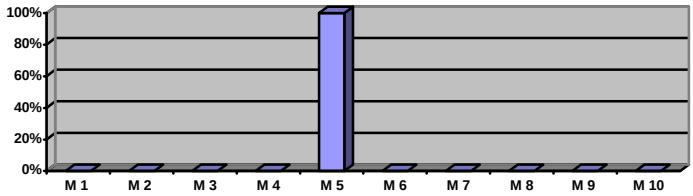
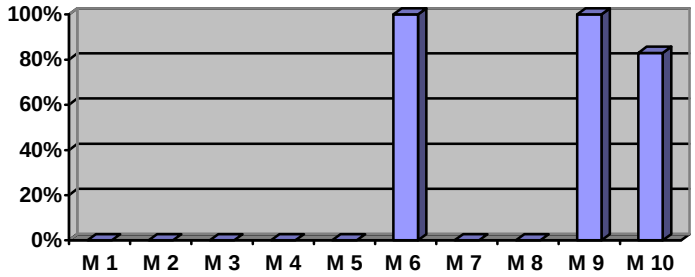
J_7 played on the intern right position and had a total number of 1 throws at the goal and scored 1 goal having an efficiency of 100%. The used procedure was throwing at the goal from jumping through which she scored 1 goal (presented in figure 7).

Figure 7. *The efficiency degree of the throws at the goal of the player's J_7*



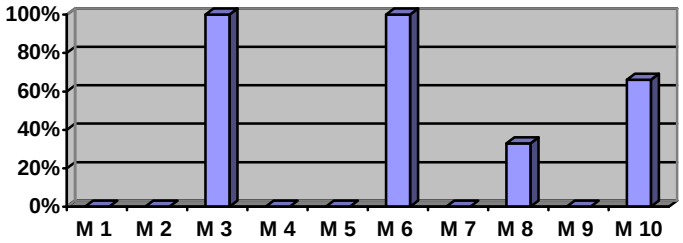
J_8 played on the intern right position and had a total number of 15 throws at the goal and scored 13 goals, having an efficiency of 86,66%. The favorite procedure was throwing at the goal by jumping through which she scored a number of 6 goals from 6 thros and by: throwing at the goal by running she scored 1 goal from 1 throw, by throwing at the goal from support she scored one goal from one throw and by throwing at the goal from plunge she scored 5 goals from 7 throws (presented in figure 8).

Figure 8. *The efficiency degree of the throws at the goal of the player's J_8*



J_9 played on the pivot position and realized a total number of 10 throws at the goal and scored 6 goals having an efficiency of 60%. The favorite procedure was throwing at the goal from jumping through which she scored 3 goals from 5 throws and throwing at the goal from plunge through which she score 3 goals from 5 throws (presented in figure 9).

Figure 9 *The efficiency degree of the throws at the goal of the player's J_9*



J_{10} played on the extreme left position. She realized a total number of 9 throws at the goal and scored 6 goals having an efficiency of 66,66%. The favorite procedure was throwing at the goal from plunge through which she scored 3 goals from 5 throws and by throwing at the goal from running she scored 2 goals from 2 throws and by the 7 m throw she scored 1 goal from 1 throw (presented in figure 10).

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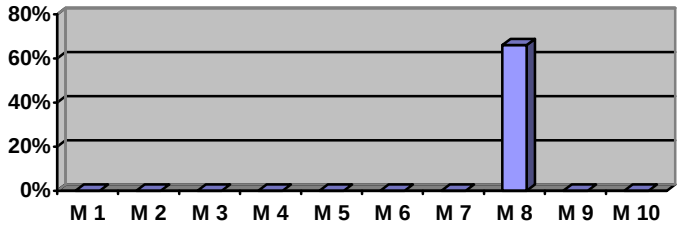
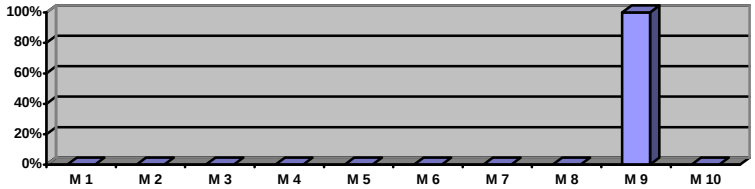
Figure 10. *The efficiency degree of the throws at the goal of the player's J_{10}*



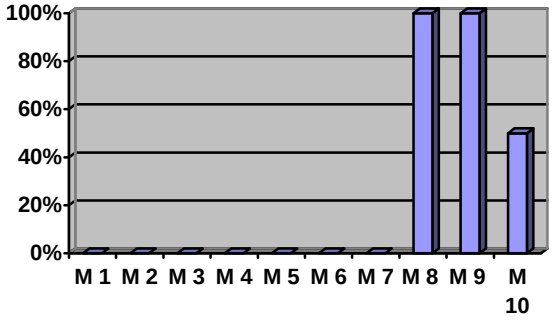
J_{11} played as game coordinator. She had a total number of 2 throws at the goal and scored 2 goals, having an efficiency of 100%. The used procedures by the player were throwing at the goal from support through which she scored 1 goal from 1 throw and throwing at the goal from plunge through which she scored 1 goal from 1 throw (presented in figure 11).

Figure 11. *The efficiency degree of the throws at the goal of the player's J_{11}*



J_{12} played on the intern right position. She realized a total number of 5 throws at the goal and scored 4 goals having an efficiency of 80%. The favorite procedures were throwing at the goal by jumping through which she scored 3 goals from 4 throws and throwing at the goal from the hip through which she scored 1 goal from 1 throw (presented by figure 12).

Figure 12. *The efficiency degree of the throws at the goal of the player's J_{12}*



Conclusions and suggestions

In conclusion, after the study that we made with the senior women handball team from C.S.M. Ploiești, we noticed that throwing at the goal from jumping and the one from plunge were emphasized.

The most effective team player who played in every game was J_1 that was playing on the intern left position with 89 scored goals. The second place was held by J_4 who was playing as a game coordinator with a total of 67 scored goals. On the third place we have J_6 that played as an intern right and J_5 as an extreme right, each having a number of 37 scored goals. In total the team scored a number of 300 goals having a mean per game of 30 goals.

The most efficient played of the team that played in all games was J2 that played on the position of extreme left with a percentage of 74,46%. On the

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second place we have J_6 that played as intern right with a percentage of 68,51%. On the third place we have J_5 that played as extreme right with a percentage of 60,65%. In what concerns the C.S.M. Ploiesti team we can notice that the players from 9 m line were the most efficient, followed by the pivot that presented a low efficiency.

After the carried out study I believe we need to impose certain suggestions for the improvement of the efficiency of throwing at the goal procedures by taking the following measures:

- the coach to devote more time in preparing the team in what concerns the efficiency of the throws at the goal of the players;
- developing certain exercises specific to throwing at the goal from the posts;
- the execution of throws at the goal by the main technical procedures specific to each post until exhaustion;
- exercises for physical training of the players because in the second half the performance of the team was lowering due to fatigue;
- bringing new players as reserves did not show the same value and level of training as of the starting line-up.

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STUDY ON HIGH JUMPERS ON THE WORD

GHEORGHE DANIEL[1]

Abstract

Purpose. This work has proposed that purpose, to separate the essential data for selection and training high performance athletes in the perspective of major international competition.

Methods. As research methods I used the case study, observation and statistics.

Results. For the final selection to the Olympics, to accede to one of the medals, the athlete's performance should be over 2.30 m. If we have several athletes with special performances, we should focus primarily on those with a richer experience, with several international competitions, so a little older.

Conclusions. In 2 of the 5 Olympics, the performance for the first place is equal to the average top, which confirms first hypothesis. The top average age is 24 years and 7 months which confirms the second hypothesis. The third hypothesis is confirmed with the observation that for the Olympics the performance is the supreme criterion, the height isn't a decisive criterion (there are medalists with height below top average). The hypothesis of the athlete's weight isn't confirmed, recording an average of 77,36 kg. We only have significant correlation between athlete's height and weight.

Key words: athletes, performance, statistics.

Introduction

The present study is an analysis of the finalists from the last two Olympics and the first three of the last five Olympics. Also were processed and analyzed the data of the world's top athletes at high jump. Based on these data, it could be extracted the exceptions, the constant elements in performance and somatic data.

The effort provided by the high jumpers , is a type of anaerobic alactacid.

The small phosphocreatine (PC) deposit is that who supplies power for muscles for 7 to maximum 10 seconds. (T.O. Bompa. 2001)

In evaluating athletes we must always take into account two fundamental components of human performance in general: the biological and psychological.

In this way the body composition corresponds to the structural components of the human body composed of elements of very different nature and density (bone, fat, water, protein), maintained in constant proportion and functionally integrated. (M. Cordun, 2011) In this way the precise knowledge of the athlete's height and weight and is welcome framing it in a test pattern.

Many times in the sport's practice, While coaches respected the specific training method's guideline, worked with athletes selected by the constitutional model, they did not achieved the expected performance, because they neglected psychological component.

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Email: daniel_g19071963@yahoo.com
Received 12.05.2012 / Accepted 18.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

The goal of mental preparation for competition, consists in forming for athletes, of a system of attitudes and behavior, with operational and regulative character through which it is flexible and adapts to contest's situations and opponents actions. (I. Holdevici, M. Epuran, F. Toniţa, 2008)

Purpose

This work has proposed that purpose, to separate the essential data for selection and training high

performance athletes in the perspective of major international competition.

Hypotheses

In this study, I begun with the following hypotheses in order to be tested:

- The word-class athletic performances at the Olympics, for the first three places, are not significantly different from the average performance of world top;
- The age of athletes who participate in the Olympics, are not different from the average of the world top and is somewhere over 20 years;
- Height of the worldwide athletes is located somewhere on average to 190 cm.
- The athlete's weight, from high jump, is located somewhere on average between 85 and 90 kg.
- Isn't significant correlations between the indicators mentioned above.

Methods

As research methods I used the case study, observation and statistics.

Content of the work

It has been processed the data of 39 athletes who participated in the last five Olympics and of the world top 103 jumpers. After harvest data, resulted 214 performances, 214 age data and 193 data on height and weight of athletes in high jump.

Data were included in Microsoft Excel of Microsoft Office and processed on the following statistical indicators: number of cases, the maximum value, minimum value, amplitude, mode, median, average, quartile 1, 3, quartile difference, dispersion, average of absolute deviation, standard deviation, coefficient of variation and correlation.

In fact we agree with the definition of statistical indicator as "a numerical expression of phenomena, processes, activities or economic and social categories, defined in time, space and organizational structure". (A.B. Cărbunaru, 2009)

Results

Table 1. Indicators of the medalists in last 5 Olympics

Name and Surname	Performance	Age	Height	Weight	Olympics	Position
Javier Sotomayor	2,34	25	195	82	Barcelona 1992	1
Patrick Sjoberg	2,34	27	200	82	Barcelona 1992	2
Artur Partyka	2,34	23	192	71	Barcelona 1992	3
Tim Forsyth	2,34	19	199	79	Barcelona 1992	3
Hollis Conway	2,34	25	184	68	Barcelona 1992	3
Charles Austin	2,39	29	184	77	Atlanta 1996	1
Artur Partyka	2,37	27	192	71	Atlanta 1996	2
Steve Smith	2,35	25	185	75	Atlanta 1996	3
Sergey Klyugin	2,35	26	190	80	Sydney 2000	1
Javier Sotomayor	2,32	33	195	82	Sydney 2000	2
Abderrahmane Hammad	2,32	23	189	70	Sydney 2000	3
Stefan Holm	2,36	28	181	70	Athens 2004	1
Matt Hemingway	2,34	32	201	84	Athens 2004	2
Jaroslav Baba	2,34	20	196	80	Athens 2004	3
Andrey Silnov	2,36	24	198	83	Beijing 2008	1
Germaine Mason	2,34	25	187	68	Beijing 2008	2
Yaroslav Rybakov	2,34	28	198	84	Beijing 2008	3

Table 2. Indicators of top all-time outdoor seniors[1]

Name and Surname	Performance	Age	Height	Weight	Venue	Position
1. Javier Sotomayor	2,45	26	195	82	Salamanca	1
2. Patrick Sjoberg	2,42	22	200	82	Stockholm	1
3. Igor Paklin	2,41	22	193	74	Kobe	1
4. Rudolf Povarnitsyn	2,40	23	201	75	Donetsk	1
5. Sorin Matei	2,40	27	184	71	Bratislava	1
6. Charles Austin	2,40	24	184	77	Zurich	1
7. Vyacheslav Voronin	2,40	26	190	78	London	1
8. Jianhua Zhu	2,39	21	193	70	Eberstadt	1
9. Hollis Conway	2,39	22	184	68	Norman. OK	1

10. Gennadiy Avdeyenko	2,38	24	200	82	Roma	2
11. Sergey Malchenko	2,38	25	190	74	Banska Bystrica	3
12. Dragutin Topic	2,38	22	197	77	Belgrad	1
13. Troy Kemp	2,38	29	187	69	Nice	1
14. Artur Partyka	2,38	27	192	71	Eberstadt	1
15. Jacques Freitag	2,38	23	204	83	Oudtshoorn	1
16. Andriy Sokolovskyy	2,38	27	196	80	Roma	1
17. Andrey Silnov	2,38	24	198	83	London	1
18. Valeriy Sereda	2,37	25	186	73	Rieti	2
19. Carlo Thranhardt	2,37	27	199	85	Rieti	2
20. Tom McCants	2,37	26	185	79	Columbus	1
21. Jerome Carter	2,37	25	185	74	Columbus	2
22. Sergii Dymchenko	2,37	23	205	75	Kiev	1
23. Steve Smith	2,37	19	185	75	Seoul	1
24. Stefan Holm	2,37	32	181	70	Athens	1
25. Williams Jesse	2,37	28	184	75	Eugene	1
26. Gerd Wessig	2,36	21	201	88	Moscova	1
27. Sergey Zasimovich	2,36	22	188	73	Tashkent	1
28. Dietmar Mogenburg	2,36	23	201	80	Eberstadt	3
29. Eddy Annys	2,36	27	187	73	Gent	1
30. Jim Howard	2,36	28	196	80		
31. Clarence Saunders	2,36	27	188	75	Auckland	1
32. Doug Nordquist	2,36	32	193	79	Norwalk	2
33. Georgi Dakov	2,36	23	196	80	Bruxelles	2
34. Dalton Grant	2,36	25	186	76	Tokyo	4
35. Labros Papakostas	2,36	23	193	78	Athens	1
36. Tim Forsyth	2,36	24	199	79	Melbourne	1
37. Steinar Hoen	2,36	26	193	75	Oslo	1
38. Sergey Klyugin	2,36	24	190	80	Zurich	1
39. Konstantin Matusevich	2,36	29	202	85	Perth	1
40. Martin Buss	2,36	25	193	81	Edmonton	1
Name and Surname	**Performance**	**Age**	**Height**	**Weight**	**Venue**	**Position**
41. Aleksander Walerianczyk	2,36	21	195	78	Bydgoszcz	1
42. Michal Bieniek	2,36	21	195	73	Biala Podlaska	1
43. Jaroslav Baba	2,36	21	196	80	Roma	2
44. Dusty Jonas	2,36	22	193	82	Boulder	1
45. Ivan Ukhov	2,36	24	192	83	Opole	1
46. Aleksey Dmitrik	2,36	27	189	74	Cheboksary	1
47. Jacek Wszola	2,35	24	190	75	Eberstadt	1
48. Gerd Nagel	2,35	31	188	74	Forbach	1
49. Darrin Plab	2,35	22	190	79	New Orleans	2
50. Mark Boswell	2,35	22	189	66	Sevilla	2
51. Nathan Leeper	2,35	23	188	82	Sacramento	1
52. Victor Moya	2,35	23	194	80	Monaco	1
53. Donald Thomas	2,35	23	190	75		
54. Yaroslav Rybakov	2,35	27	198	84	Osaka	2
55. Kyriakos Ioannou	2,35	23	193	60	Osaka	3
56. Andra Manson	2,35	25	196	75	Austin	1
57. Ivan Ukhov	2,35	23	192	83	Cheboksary	1
58. Vladimir Yashchenko	2,34	19	193	74	Tbilisi	1
59. Dwight Stones	2,34	31	197	81	Los Angeles	1
60. Robert Ruffini	2,34	21	186	75	Prague	1
61. Aleksey Yemelin	2,34	22	205	88	Split	2
62. Rolandas Verkys	2,34	25	193	77	Warszawa	1
63. Arturo Ortiz	2,34	25	194	73	Barcelona	2
64. Marino Drake	2,34	24	193	73	Paris-Saint Germaine	2

65. Ralf Sonn	2,34	26	197	85	Stuttgart	4
66. Jin-taek Lee	2,34	25	189	70	Seoul	1
67. Wolfgang Kreissig	2,34	29	196	80	Mannheim	1
68. Kwaku Boateng	2,34	26	193	84	Zagreb	1
69. Abderrahmane Hammad	2,34	23	189	70	Alger	1
70. Matt Hemingway	2,34	31	201	84	Modesto	1
71. Germaine Mason	2,34	20	187	68	Santo Domingo	1
72. Grzegorz Sposob	2,34	28	200	87	Bydgoszcz	1
73. Jamie Nieto	2,34	28	193	79	Athens	4
74. Tomas Janku	2,34	32	192	78	Goteborg	2
75. Linus Thornblad	2,34	21	180	76	Goteborg	4
76. Andrey Tereshin	2,34	25	195	78	Warszawa	1
77. Kabelo Kgosiemang	2,34	22	188	71	Addis Ababa	1
78. Jesse Williams	2,34	26	184	75	Eugene	1
79. Aleksey Demyanyuk	2,33	23	188	80	Leningrad	1
80. Milton Ottey	2,33	27	178	69	Ottawa	1
81. Lee Balkin	2,33	26	192	75	Durham	1
82. Brian Stanton	2,33	27	196	82	Walnut	1
83. Marcello Benvenuti	2,33	25	182	64	Verona	1
84. Zhongge Zhou	2,33	23	187	75	Beijing	1
85. Jean-Charles Gicquel	2,33	27	200	81	Eberstadt	4
86. Gilmar Mayo	2,33	25	190	72	Pereira	1
87. Svatoslav Ton	2,33	26	192	74	Praga	1
88. Yuriy Krymarenko	2,33	22	187	65	Langen	1
89. Tora Harris	2,33	28	190	83	Indianapolis	1
90. Naoyuki Daigo	2,33	25	182	67	Kobe	1
91. Scott Sellers	2,33	21	190	72	Lincoln	1
92. Aleksey Dmitrik	2,33	25	189	74	Thessalonoki	1

1 – www.iaaf.org

Table 3. Statistics indicators of the participants in last 5 Olympics

Indicators	Performance	Age	Height	Weight		
N	39	39	32	32		
N. max.	2,39	34,00	202,00	85,00		
N. min.	2.20	19,90	181,00	65,00		
Amplitude	0,19	15,00	21,00	20,00		
Mode	2,34	24	181	70		
Median	2,32	26,00	192,00	78,00		
Average	2,31	26,13	191,69	76,16		
Quartile 1	2,29	24	187,75	70		
Quartile 3	2,34	28	196,25	80,5		
Quartile difference	0,05	4,00	8,50	10,50		
Dispersion	0,002084	12,62459	35,83984	36,81934		
Average absolute deviation	0,035897	2,817883	5,082031	5,376953		
Standard deviation	0,045651	3,55311	5,986639	6,067894		
Coefficient of variation	1,975581	13,59875	3,123124	7,96769		
Correlation[2]	-0,03222	0,036656	0,206216	0,002896	0,772136	0,147836

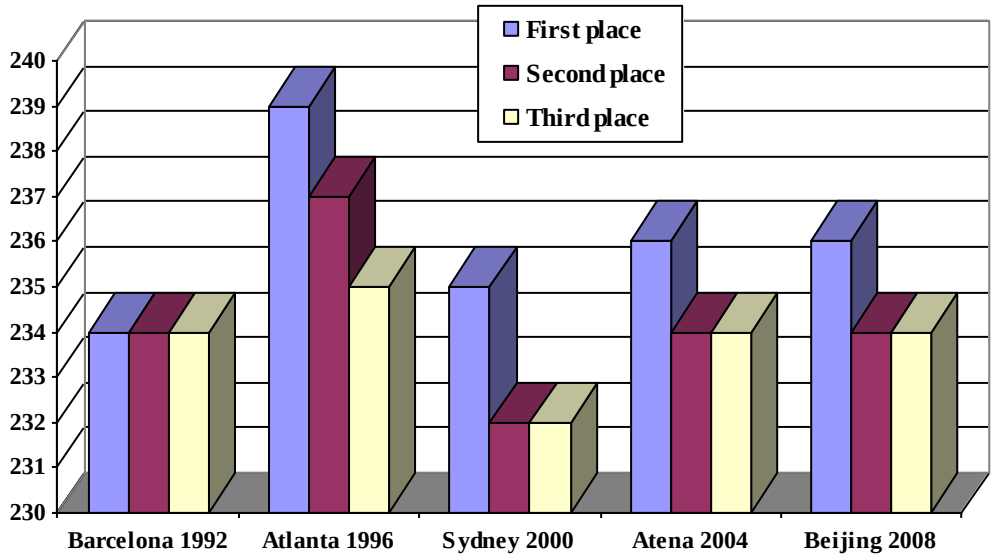
Table 4. Statistics indicators of world top high jumpers

Indicators	Performance	Age	Height	Weight		
N	175	175	161	161		
N. max.	2,45	32,00	205,00	88,00		
N. min.	2,33	19,00	178,00	60,00		
Amplitude	0,12	13,00	27,00	28,00		
Mode	2,37	27	195	82		
Median	2,37	25,00	193,00	78,00		
Average	2,37	24,69	192,43	77,28		

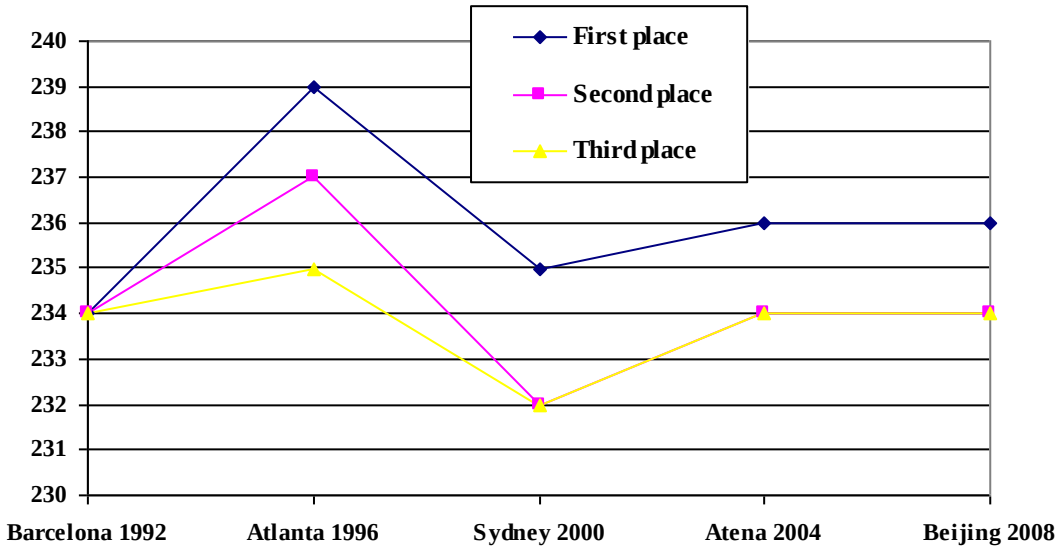
Quartile 1	2,34	22	188	74		
Quartile 3	2,38	27	195	82		
Quartile difference	0,04	5,00	7,00	8,00		
Dispersion	0,000594	8,066939	31,41345	30,88461		
Average absolute deviation	0,019389	2,357551	4,585471	4,791096		
Standard deviation	0,024375	2,840236	5,60477	5,557392		
Coefficient of variation	1,030577	11,50558	2,912556	7,191289		
Correlation[2]	-0,02618	0,186011	0,224453	-0,07264	0,696224	0,114456

2 - In order from left to right: correlation between performance and age, the correlation between performance an height, the correlation between performances and weight, the correlation between age and height, the correlation between height and weight the correlation between age and weight.

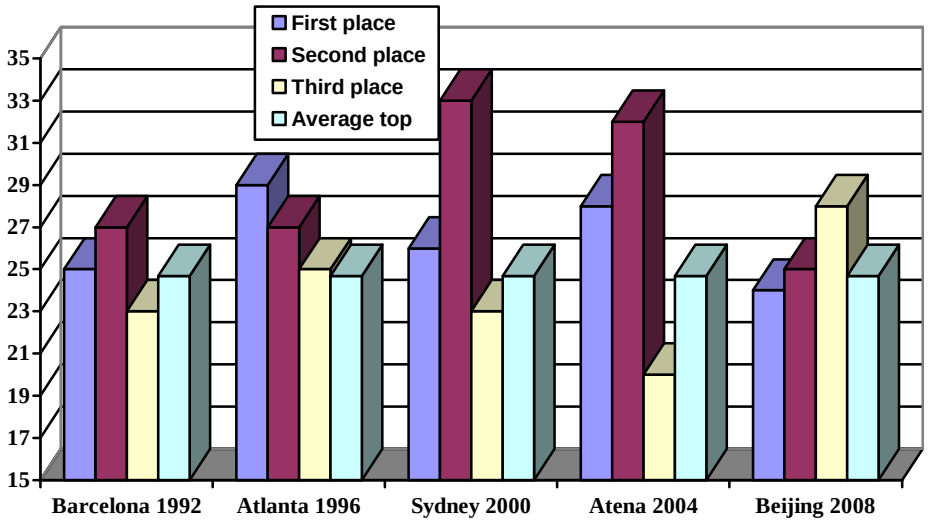
Graphic 1. The evolution of medalist's performances at the last 5 Olympics



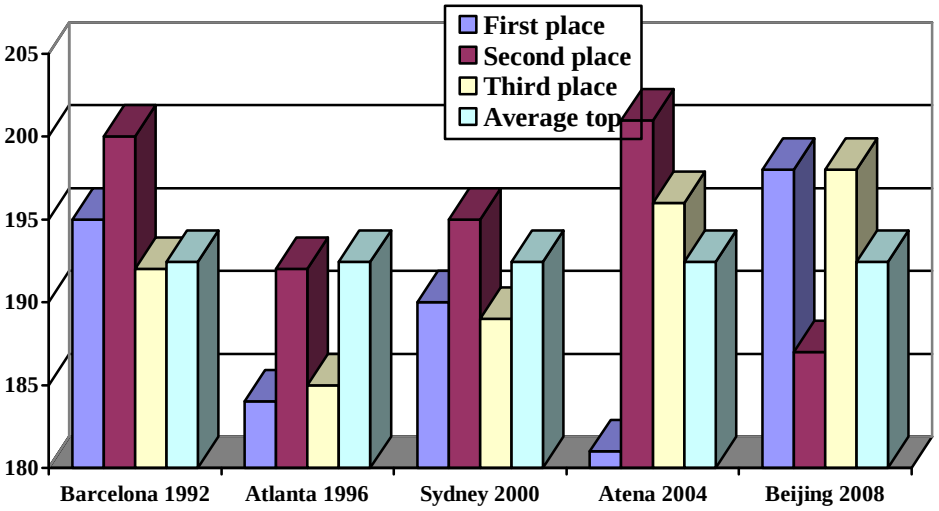
Graphic 2. The evolution of medalist's performances at the last 5 Olympics



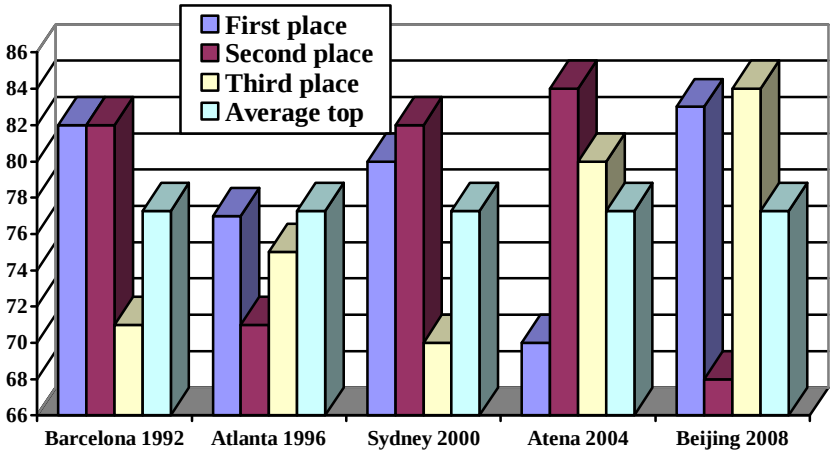
Graphic 3. Athlete's age at last 5 Olympics



Graphic 4. Athlete's height at last 5 Olympics



Graphic 5. Athlete's weight at last 5 Olympics



Discussions

We interpret the values obtained from performance indicators, age, height and weight.

Performance. apart from the Atlanta Olympics in 1996, when it was Olympic record with 2.39 meters, Olympic medalists performances are below the average of the world's best performers. However these results are not significantly different, so we can state that for the first place at the Olympics we should have results around this average.

Age. Compared to the top athlete's average, located in 24years and 7 month, the editions Atlanta and Athens Olympic champions have a more advance age, respectively 29 and 28 years. Yet, as medalist's average we can't say that it differs greatly.

Height. In three of five Olympics, the champion's height is smaller than the top average. All in all the Olympic medalists are around the average.

Weigh. In two of five Olympics the champion's weight is greater than the top average.

Conclusions

1. In 3 of the 5 Olympics, the performance for the first place is equal to the average top, which confirms first hypothesis.

2. The top average age is 24 years and 7 months which confirms the second hypothesis.

3. The third hypothesis is confirmed with the observation that for the Olympics the performance is the supreme criterion, the height isn't a decisive criterion (there are medalists with height below top average).

4. The hypothesis of the athlete's weight isn't confirmed, recording an average of 77.28 kg.

5. We only have significant correlation between athlete's height and weight.

Proposals

1. For the final selection to the Olympics, to accede to one of the medals, the athlete's performance should be over 2.30 m.

2. If we have several athletes with special performances, we should focus primarily on those with a richer experience, with several international competitions, so a little older.

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IDENTIFY THE PHYSICAL ABILITIES OF 11-12 YEARS OLD STUDENTS FROM MIDDLE SCHOOL

GEVAT CECILIA[1], LARION ALIN[1], SABAU ELENA[2], NICULESCU GEORGETA[2]

Abstract

The purpose of this transversal experiment is to identify the development level of physical abilities of 25 boys and 25 girls of 11-12 years old from middle school of Constanta, Romania and Johannesburg, South Africa and to see if there are significant differences regarding the physical abilities between these students groups within our research.

Methods. The assessment of the development of the physical abilities was achieved through a series of test which examined the time during the 50mp event, long jump with run up event, throwing the little ball (oina) and 800m event. 75 girls and 75 boys aged 11-12 years were divided into three groups: the experiment group of Constanta, Romania (E girls, E boys) and 2 control groups for girls and boys (C_1 African children of German origin and C_2 children of African origin), both groups of Johannesburg all were tested in the 50mp event, long jump with run up, throwing the little ball (oina) and 800m events. The results were statistically processed through the One Way ANOVA Independent groups and Post ANOVA TUKEY HSD test.

Results.At boys the analyses of One Way ANOVA Independent groups and Post ANOVA TUKEY HSD test for 50mp, have shown insignificant differences between all groups.At long jump with run up One Way ANOVA Independent groups and Post ANOVA TUKEY HSD test revealed significant differences between E-C_1 and E-C_2 groups in favor of group E. In the throwing the little ball (oina) event, the significant differences were between E-C_1

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Received 10.05.2012 / Accepted 11.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

and C_1-C_2 groups in favor of C_1. At 800 m event analyze of ANOVA shows value significant between E-C_1 in favor E group and between C_1-C_2 ther are significant differences in favor of C_2 groups and insignificant differences between E-C_2 groups.

Girls: ANOVA test relieved for time in seconds at 50m speed running insignificant differences for all groups.There are different significant for Long jump run up between E-C_2 groups insignificant differences between E-C_1 and C_1- C_2 groups. For little ball (oina) there are significant differences value for E-C_1 in favor for C_1. At 800m event are significant differences between C_1- C_2 in favor for C_1group, also is significant difference between E-C_1 in favor of E group.

Conclusions. The Romanian girls (E) registered high results long jump events then African students of German origin group C_1 and African Students C_2. The significant differences between group E and C_1- C_2 can be explained for long jump run up only regarding higher level for acquiring of technical preparing..

For Little ball (oina) African students of German origin group obtained higher results then C_2 and E groups and conclusions is explosive power for arms are more better to C_1 . For 800 m events C_2 group are the best results then E and C_1 and this difference can be explained only by origin human (black students).

At boys groups the Romanian group obtained the best performance for long jump run up and 800m. At little ball throwing the best results are for African students of German origin group. All this differences can be explained by very different curriculum in Romania against South Africa in Johannesburg city.

Key words: physical abilities, students, middle school.

Introduction

Today, the way of looking to physical education in developed countries is having a healthy society with the good harmony of education. Constantly changing and developing events and technology have begun to have an impact on individuals.

The function of education here is to provide qualified manpower in the society against this effect. As it is known, qualified manpower requires being physically, mentally and spiritually healthy. This can be done by multi-faceted motion and physical training, which forms basis and principles of physical education. With this regard, physical education takes its own place in the integrity of education (M. Yalçıner, 1992, 65 quoted by O. Pepe et all, 2011). In Romania "physical education is an important component of global education.

Through its specific content and through its systemic influences on the people, both are one of a path to general education in motricity physically, intellectually, emotionally and aesthetically plan". Also "Physical education is education through movement". Physical Education content is adapting our behavior to move. Exercises are ways to improve driving ability. Their technique is not important. Important is man who using exercise (A. Dragnea et al, 2006.)

Quantum contribution of school physical education conducive to areas of key competences of compulsory education in Europe and implicitly in Romania, all leading to redefine the discipline model.(P. Dragomir, E.Scarlat,2004,).

For the area in physical education and sport in Romania are provided two hours per week and another hour per week as an optional extension character. Extending hour as an optional extension is granted only to classes that have chosen them having oun own schedule.

The curriculum provides a framework of best practice for physical education in middle school. One of all students from elementary school in Romania Romania has 4 hours of physical education per week: 2 compulsory and one lesson is optional extension and the forth lessons is for preparation of sport team of school.(E. Scarlat, B. M. Scarlat, 2006).

For curriculum on 5-6 degree contents as athletics test:50m speed running, long jump with run up, throwing with little ball and 600m for girls /800m boys. .(E. Scarlat, B. M. Scarlat,2006).

Principles of educational training process in physical education and sports training are: educational principles, learning principles, principles athletic training, dynamic exercise, training invisible.(DE Colibaba, 2007).

The drastic changes in the place and status of Physical Education in the South African school curriculum has followed much the same route as that of Physical Education in England, the U.S.A. and Australia. After being officially dropped from the South African curriculum in 1994, Physical Education was only recently reinstated as a quarter-part of the subject Life Orientation. (S. Pill, 2006,). Physical activity is a vital part of a healthy lifestyle and has been linked to a reduced risk of developing a wide variety of diseases, as well as been found to promote psychological wellbeing, reduce stress, anxiety, depression and promote social interaction and integration.(US, Department of Health and Human Services quoted by , I. Gorgut et al, 2012).

Methods

75 girls and 75 boys aged 11-12 years were divided into three groups for girls and three groups for boys: the experiment group of Constanta, Romania (E girls, E boys) and 2 control groups for girls and boys (C_1 African children of German origin and C_2 children

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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of African origin both groups of Johannesburg). All of them groups were tested in: 50mp event, long jump with run up, throwing the little ball (oina) with 3running steps and 800m events.

All subjects were informed about the aims of this study. Romanian groups are from elementary school (Constantin Bratescu College from Constanta). Africans groups are from Germany Elementary School, Johannesburg. The results from Johannesburg was collected by Claudia Jeffries, head of Sport Department in September, last week before holiday October, 2011.

The results from Constanta were collected from Cristina Popescu, physical education and sport teacher, during the lessons of physical education, 2011, 3-9 October.

Subjects measurements were on the concrete and grass land from every school. It was normal sports equipment for physical education lesson for all subjects. The tests consist in following events: 50m-free departing running, long jump with run up, (from two jumps was taken into consideration the best result, throwing the little ball (oina) and from two throwing was taken into consideration the best result and the last 800m events.

The age and height averages of the subjects of girls experimental groups were: Romanian girls n=25: 139±6,2 cm, weight 31 ±7,2 kg; African girls n=25: 142±3,8cm, weight:39,4±5kg;Africans girls German origin, n=25:140,4±5cm, weight 41,3±4kg;respectively for boys groups: Romanian n=25: 138±8,4 cm, weight 33 ±4,4 kg; Africans n=25:140±5,6cm,weight:35,4±4,2kg;Africans German origin, n=25: 143,4±4cm, weight 38,1±3kg.

Hypothesis: We believe that among the three groups both girls and boys there are significant differences in all four samples.

Results

The results were statistically processed through the One Way ANOVA Independent groups and Post ANOVA TUKEY HSD test. **(SSPESS v.9.1)**

Table no. 1 Results Anova boys groups

Parameters			
50mp			
Boys groups	**M±SD**	**CV %**	**Anova**
Ro (E)	8.769±1.846	21.051	F(2;7)=0.319
SA (C_1)	9.396±3.947	42.007	p>0.05
SA (C_2)	9.036±2.071	22.919	
Long jump run up			
Ro (E)	3.677±0.608	16.535	F(2;7)=4.384
SA (C_1)	3.296±0.491	14.897	P<0.05
SA (C_2)	3.307±0.441	13.335	
Little ball			
Ro (E)	24.8±5.194	20.944	F(2;7)=4.373
SA (C_1)	29.792±6.698	22.483	P<0.05
SA (C_2)	28.2±6.191	21.954	
800m			
Ro (E)	3.127**±0.263**	8.411	F(2;7)=1.584
SA (C_1)	3.624±0.545	15.039	P<0.05
SA (C_2)	3.31±0.259	7.825	

Table no.2.Critical Tukey HSD Value

Boys groups	**50MP**	**Long jump run up**	**Little ball**	**800m**
	insignificant	3.15;p<0.05	4.34;p<0.05	0.258;p<0.05
E- C_1	-	0.381;p<0.05	4.992;p<0.05	0.497;p<0.05
E-C_2	-	0.37;p<0.05	3.4;p>0.05	0.183;p>0.05
C_1- C_2	-	0.011;p>0.05 ω^2=0.082=8.2%	1.592;p<0.05 ω^2=0.084=8.4%	0.314;p<0.05 ω^2=0.211=21.1%

At boys the analyses of One Way ANOVA Independent groups (tab. no 1) and Post ANOVA TUKEY HSD test for 50mp,(tab. no.2) have shown insignificant differences between all groups for F(2;7)=0.319.p>0.05. (tab.no.1)

At long jump with run up One Way ANOVA Independent groups and Post ANOVA TUKEY HSD test revealed significant differences between E-C_1 and E-C_2 groups in favor of group E and between groups C_1- C_2 is insignificant differences.

Value of F(2;7)=4.072 for p<0.05 it is higher than the F critical value 0.254 for P< 0.05.(tab.no.1) Post ANOVA TUKEY HSD test shows significant differences between E-C_1 and E-C_2 groups for P<0.05 and value of 0.332. (tab. no 2)

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At the throwing the little ball (oina) event, the significant differences were between E-C_1 and C_1-C_2 groups in favor of C_1 and insignificant differences between E-C_2. F (2;7)=4.373 is higher than the Fcritical value =4.34;p<0.05 value. tab.no.1)

At 800 m event analyze of ANOVA shows F(2;7)=1.584 P<0.05is higher than $F_{critical}$ value 0.258 p<0.05. (tab.no.1)

Post ANOVA TUKEY HSD test has value significant difference for 0.497 at p<0.05 between E-C_1 in favor E group and between C_1-C_2 value is 0.314 at p<0.05 with significant differences in favor of C_2 groups and insignificant differences between E-C_2 groups. (tab. no 2)

Tab. no.3. Results Anova girls groups

Parameters			
50mp			
Girls groups	**M±SD**	**CV %**	**Anova**
Ro (E)	8.638±0.735	8.50	F(2:7)=2.192
SA (C_1)	8.9±0.85	9.51	p>0.05
SA (C_2)	9.091±0.709	7.799	
Long jump run up			
Ro (E)	3.21±0.293	9.128	F(2;7)=4.072
SA (C_1)	2.995±0.498	16.628	p<0.05
SA (C_2)	2.921±0.289	9.894	
Little ball			
Ro (E)	16.38±2.599	15.867	F(2;7)=5.761
SA (C_1)	19.88±5.441	27.227	p<0.05
SA (C_2)	18.392±2.455	13.348	
800m			
Ro (E)	3.581±0.397	11.086	F(2;7)=1.535
SA (C_1)	3.529±0.732	20.742	P<0.05
SA (C_2)	3.982±0.614	15.419	

Table no.4 Critical Tukey HSD Value

Girls Groups	50MP	Long jump run up	Little ball	800m
	insegnificant	0.254; p<0.05	2.556;p<0.05	0.406;p<0.05
E- C_1	-	0.215;p>0.05	3.6;p<0.05	0.052p>0.05
E-C_2	-	0.289; p<0.05	2.012;p>0.05	0.401p>0.05
C_1- C_2	-	0.074;p>0.05 ω^2=0.076=7.6%	1.588;p>0.05 ω^2=0.113=11.3%	0.453p<0.05 ω^2=0.025=2.5%

Girls: ANOVA test relieved for time in seconds at 50m speed running ($t_{(s)}$) F (2;7)=2.192p>0.05. insignificant differences.(tab.no.3)

There are different significant for Long jump run up F (2;7) = 4.072 where Fcritical is 0.254 at p<0.05. .(tab.no.3). Significant differences are between E-C_2 groups where Critical Tukey HSD value is 0.289 at p<0.05 and insignificant differences between E-C_1 and C_1- C_2 groups.

There are insignificant differences between C_1-C_2 subjects groups. (tab.no.4) Critical Tukey HSD Value there is 0.074. C_1- C_2 and for respectively E- C_1 0.215(tab.no 4).

For little ball (oina) F(2;7)=5.761 at p<0.05 and there are significant differences value for E-C_1 where Critical Tukey HSD value 3.6 at p<0.5 in favor for C_1. There are insignificant differences between C_1-C_2 subjects groups. (tab.no.4) Critical Tukey HSD Value there is 1.588. (tab.no.4).

At 800m event are significant differences between C_1- C_2 in favor for C_1 group for Post ANOVA TUKEY HSD test = 0.406;p<0.05; where F(2;7) = 1.535for p<0.05 which is higher than $F_{critical}$ =0.258 at p<0.05.Also is significant difference between E-C_1 in favor of E group.(tab. nr 3,4). ω^2 is better for little ball at girls (tab.no.4) and bore better at 800m event for boys.(tab.no.2).

where Critical Tukey HSD value 3.6 at p<0.5 in favor for C_1. There are insignificant differences between C_1-C_2 subjects groups. (tab.no.4) Critical Tukey HSD Value there is 1.588. (tab.no.4).

At 800m event are significant differences between C_1- C_2 in favor for C_1 group for Post ANOVA TUKEY HSD test = 0.406;p<0.05; where F(2;7) = 1.535for p<0.05 which is higher than $F_{critical}$ =0.258 at p<0.05.Also is significant difference between E-C_1 in favor of E group.(tab. nr 3,4). ω^2 is better for little ball at girls (tab.no.4) and bore better at 800m event for boys.(tab.no.2).

Results

Study results show no major differences between girls groups or boys groups. For 50m speed running for all the groups is insignificant difference. So, reserve rate for speed running at this age is the same regardless of ethnicity.

For long jump Romanian girls and boys registered better results. Maybe Romanian curriculum is better then African curriculum regarding technical capacity of children at all of the physical education lessons.

At little ball German groups girls and boys are better. For 800m also girls' group German origin are better and for boys Romanian group.

Regarding African curriculum, D. Du Toit, N. Van der Merwe, 2006, consider "The drastic changes in the place and status of Physical Education in the South African school curriculum has followed much the same route as that of Physical Education in England, the U.S.A. and Australia. After being officially dropped from the South African curriculum in 1994, Physical Education was only recently reinstated as a quarter-part of the subject Life Orientation. As with any reform effort, this positive step on the road of child health may bring with it certain challenges for the developed as well as developing communities of South Africa. The purpose of the study was to investigate the hindrances and challenges for schools in developed and developing communities of South Africa, and to then make recommendations for both the optimal implementation of Physical Education, and for future teacher training in Physical Education."

ME. Finkenberg, JM Di Nucci.consider in study from 1995, for three-way multivariate analysis of variance was conducted with gender, ethnicity, and age as the independent variables and nine physical measurements as the dependent variables.

Height was the most important discriminating physical measurement, with girls significantly taller than boys at ages 10 and 11 and with boys significantly taller than girls at age 13.

Canonical discriminant function separated African fromAmerican, children from both Caucasian and Hispanic children in height, weight, mile run, systolic blood pressure, and diastolic blood pressure.MA Monyeki et all, 2005, was to determine the relationships between the body composition characteristics, body mass index (BMI), sum of skinfolds (SSF), % body fat (%BF), fat-free mass (FFM) and waist-to-hip ratio (WHR), and nine physical fitness items in undernourished rural primary school children in Ellisras, South Africa. Significant inverse associations were found between FFM and bent arm hang (girls, B = -0.06, P = 0.05), 1600 m run (girls, B = -2.33, P = 0.003) and 50 m run (boys, B = -0.11, P = 0.006). FFM was significantly associated with standing long jump (boys, B = 0.99, P < 0.001; girls, B = 0.73, P < 0.001).

In the present study in undernourished children, body composition was significantly related to physical fitness, but not always in the expected direction. It is therefore important to note that in this population, BMI should not be interpreted as a measure of fatness/overweight, but rat.

H Singh, D S Joon, and K Kooner, 2005, in their study was conducted on 294 north Indian boys of 9-16 years of age. The boys were studying in a sports school and were doing systematic sports training twice a day.

The following tests were conducted on the subjects: Standing broad jump, standing shot put (4 kg), 40 m sprint, zig-zag run, forward bend and reach and endurance run. The results indicated that the spurt in height, weight and motor abilities of Indian boys is less pronounced than in boys of Europe and America.

ME. Armstrong, EV. Lambert, MI. Lambert 2011, in their study measured using 8 different motor tests for 10,295 South African children and youths (5,611 boys, 4,684 girls) ages 6 to 13 years.

Although not significantly different from the White children, in the majority of cases, in the majority of cases, the children mixed ancestral origin had scores that ranged between the other two ethnic groups.

These results suggest a need for encouraging fitness in school children and the reintroduction of formal physical education into the South African school curriculum, especially into schools in which African children predominate.

These results suggest a need for encouraging fitness in school children, and the reintroduction of formal physical education into the South African school curriculum, especially into schools in which African children predominate.

CH .HILMAN et al quote by Y.Iida, et al 2010, showed that in "children higher aerobic fitness was associated with higher behavioural performance and P300 latency in a discriminative task for 7-12 years old children.

Buck et al, 2008, quote by Y. Iida et al 2010, reported a positive correlation between aerobic fitness and performance on the Stroop task..To examinate such potential influences of physical fitness on cognitive functioning, it is important to understand the developmental changes underlying such behavioural and cognitive functions."

Conclusions. The Romanian girls (E) registered high results long jump events then African students of German origin group C_1 and African Students C_2. The significant differences between group E and C_1- C_2 can be explained for long jump run up only regarding higher level for acquiring of technical preparing.

For Little ball (oina) African students of German origin group obtained higher results then C_2 and E groups and conclusions is explosive power for arms are more better to C_1 . For 800 m events C_2 group

are the best results then E and C_1 and this difference can be explained only by origin Africans human .

At boys groups the Romanian group obtained the best performance for long jump run up and 800m. At little ball throwing the best results are for African students of German origin group. All this differences can be explained by very different curriculum in Romania against South Africa in Johannesburg city.

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STUDY THE EFFECT OF USING TWO MEANS OF RECOVERY MEANS ON SOME GYMNASTICS JUNIORS' PHYSIOLOGICAL VARIABLES DURING THE COMPETITION PERIOD

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Abstract

The research aims to explore the effect of using two means of recovery means on some of the physiological variables for gymnastics' juniors during the competition period. The researcher used the experimental method, the sample was chosen purposely from the gymnastics' juniors who belong to the military sports institution in Assuit governorate in the training season 2010/ 2011 whose number is ten (10) junior players. Those junior players were divided equally into two experimental groups in addition to (5) juniors for carrying out the research perspective experiment.

One of the most important conclusions was using the cold bath as recovery mean which is better and faster than Sauna to get the recovery because its positive effect on the physiological variables.(Lactic- Glucose- the pulse).

Key words: The recovery means- competition period- the physiological variables.

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Email: amr297@yahoo.com
Received 15.05.2012 / Accepted 18.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

Introduction

The fatigue phenomenon is considered as one of the physiological processes that relate to the recovery processes. If the fatigue, as the scientists defined, is temporary drop for the ability to complete the work, we find that the recovery is the reflective process to get back with the body systems to the state of the previous performance, and to get back to another state that sometimes exceeds the pre- performance state. Thus, the fatigue is considered as positive physiological phenomenon that occurs when the sports person performs the different training acts, it appears in the form of the temporary reduction in the ability to continue to perform the needed work. (C. Tie, Y. Horikiri, J. Park, C. Tanakan, 1995). Pre-competitions period in gymnastics is considered one of the hard periods that characterized by the performance difficulty for the players, the juniors in particular. During this period the motor skills are linked together in the form of motor action, thus the player faces the difficulty of performing the motor skills completely, in addition to repeating this action for many times during the training time to get the perfection stage and the stability of the skillful performance. (A.A.F. Amr Mahmoud, 2011) As the gymnastics sport is the one that depends on anaerobic system, it is expected that the fatigue occurs early. Thus, it is necessary to put the training programs which take care with the continuity of the player's performance without feeling with the early fatigue that resulted from the deficiency of body-physiological abilities, in which the recovery process is considered as one of the stages that completes the training unit (D. Steven, 1995). The recovery means are various such as Sauna and the cold water bath. As for Sauna, it is one of the healthy means of recovery process that occupies very important place among these means; it enhances the level of body biological functions. (A.A.F. Abu Al Elaa, 1999) Sauna bathrooms are considered as one of the important recovery means on which all sports teams depend. They are considered as main part of the recovery plan. Sauna importance increase in particular during the concentrated and strong training periods and during the period that comes before the matches to get rid of the fatigue and removing the nervous tension. Sauna also helps to cure the sports injuries, improves the general body readiness and it also helps to speed the recovery after the heavy loads. Sauna is used during the training days and during the matches preparing period."Abu Elaa Abdel- Fatah" (1999) mentioned that water baths are one of water treatment means that used for treatment, healthy and recovery purposes, others say that water baths strengths the body and increases its immunity and its resistance to the diseases. Cold water activates blood circulation, which in its return activates the heart muscles and activates skin blood circulation.Through what the researcher have read from the previous studies (A.A.W. Hamdy, 2002; A.M. Alaa Abdel, 2004; I.M. Nagla, 2003; A.M. Hisham, 2001), which referred to the importance of using the means of recovery and the direct relation between them and between improving the level of the skillful performance The researcher also found out, through observing some training units, that most trainers overlooked the recovery and its different means, some of them also used the recovery means in way that isn't proper to the players' state, the matter which doesn't agree with the scientific principals of the modern sports training. This matter attracted the researcher's attention to the importance of doing study to explore the effect of using some of recovery means (the cold water bath- Sauna) on some of physiological variables (lactic- glucose- the pulse) for upgrading training and the performance level of juniors through getting back to their natural state and for defining the proper means to retain the recovery quickly.

The research objectives:

The research aims to recognize the effect of two means of recovery on some of physiological variables during the competitions of gymnastics for juniors, she will know this through:

1- Knowing the effect of using (the cold water bath- Sauna) on some of physiological variables (lactic- glucose- the pulse) of gymnastics' juniors (the research sample):
2- Knowing the differences between the aforementioned recovery means for the speedy of retaining the recovery at gymnastics' juniors (the research sample).

The research hypotheses:

1- There are statistical differences between the before and after measures of the first experimental group (Sauna) in the physiological variables of gymnastics' juniors (the research sample), these differences were on the side of the after measure.
2- There are statistical differences between the before and after measures of the second experimental group (the cold water bath) in the physiological variables of gymnastics' juniors (the research sample), these differences were on the side of the after measure.
3- There are statistical differences between the averages of the before and after measures of the first experimental group (Sauna) and the second experimental group (the cold water bath) in the physiological variables of gymnastics' juniors (the research sample).

The research's plan and procedure

The research methodology

The research used the experimental methodology for the two experimental groups through using the before and after measurement because it is proper to the research's goals and hypotheses.

The research community and sample

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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The research community included some of junior gymnasts who belong to the military sports institution in Assuit governorate who are registered in the Egyptian federation for gymnastics (15) palyers, the younger juniors with twelve years old. This sample was chosen purposely (not randomly) from the training season 2010- 2011. The research sample included ten juniors; they were divided equally into two experimental groups, in addition to five juniors for doing the research experiment. Table No. (1) shows the equality of the research variables for the research sample.

Table no.1

The arithmetic mean, the intermediate, standard deviation and torsion coefficient of age, training age, height, weight, diabetes, systolic blood pressure, diastolic blood pressure, pulse and the physiological variables included in the research

The variables		The first experimental (sauna) (pulse =5)				The second experimental group (pulse= 5)			
		The arithmetic mean	The intermediate	Standard deviation	Coefficient Of torsion	The arithmetic mean	The intermediate	Standard deviation	Coefficient Of torsion
Age		12.2	12.00	5.02	-0.83	12.80	12.0	5.40	-1.34
Training age		7.6	7.00	3.78	-0.69	7.40	7.0	3.7	-0.48
Height		172.6	175.0	5.13	-0.84	172.4	172.	5.5	0.09
Weight		25.0	25.0	7.91	0.00	26.0	26.0	5.48	1.29
Diabetes		106.0	110.0	18.51	0.08	107.6	107.	15.3	-0.05
Systolic blood pressure		123.0	120.0	12.04	0.60	119.6	116.	9.07	1.71
Diastolic blood pressure		81.6	80.0	2.70	0.58	81.80	80.0	3.49	0.39
Pulse during rest		69.0	69.0	4.64	0.23	68.4	68.0	4.62	0.11
Physiological variables after moving	pulse	156.0	157.0	7.55	-0.55	157.8	155.	14.6	0.14
	glucose	82.0	82.0	7.58	0.60	82.2	84.0	7.12	-0.44
	lactic	3.98	3.90	0.41	0.39	3.8	3.50	0.86	0.51

Table no.1 shows that the – coefficients of the training age, the height, the weight, sugar, blood pressure, the pulse and the physiological variables are confined between (-3, +3), this indicates that these coefficients are located inside the straight curve, thus the sample is distributed straightly.

The tools and means of data collecting

First: the equipment and tools used in the research:

1- Set for measuring blood pressure.
2- ACCU-CHEK set for measuring glucose rate.
3- ACCUTREND PLUS set for measuring lactic rate.
4- Sauna set.
5- Cold water bath.

Second: The forms and the personal interviews:

1- A form for surveying the experts' opinions regarding their defining to the physiological variables (the research topic). Attachment (3).
2- A form for registering the junior's data. Attachment (2).

The research procedures

1- The exploratory study:

The researcher gas made an exploratory study on a sample from the study community and outside the basic sample with five juniors who belong to the military sports institution in Assuit in the period from 1\2\2010 to 5\2\2010 under the same conditions of the basic experiment, the researcher wanted to know how is the exploratory study proper to the study sample. The exploratory study aimed to define the following:

- Knowing the appropriate and the validity of the tools and equipment used in the experiment.
- Knowing the difficulties that may face the researcher during doing the experiment.
- Choosing the assistants, defining their number and training them to use these tools and equipment.
- Training the assistants to register at the forms of the before and posteriori measurements.
- Knowing how is the topic order proper to making the research measurements.

B- The basic experiment

The researcher carried out the basic experiment of the research on 15\2\2010 after the training on the performance of training units that relate to the competition periods and performing some consequential movements. The research sample was ten juniors from the juniors of the military sports institution and the sample was divided into two experimental groups:

* The first experimental group which used the Sauna as one of the recovery means and consists of five juniors, attachment (4).
* The second experimental group which used the cold water bath as one of the recovery means which consists of five juniors. Attachment (5).

1- The before measurement:

The researcher made the before physiological measurements for every experimental group before using the means of recovery as the following:

- Measuring the pulse rate.
- Measuring the glucose rate in the blood.

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Vol. XII, ISSUE 2 Supplement 2012, Romania
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- Measuring lactic in the blood.

2- Using the recovery means included in the research:

After the researcher had made the before measurements on the two groups of the research through entering the first experimental group, which used Sauna as recovery mean, into the Sauna room for ten minutes , then we entered the second group, which used the cold water bath as recovery mean, into the cold bath for five minutes.

3- The posteriori measurement:

After finishing the time limited to get out of the recovery means, the researcher carried out the posteriori measurements on the individuals of the research sample (the two experimental groups) whose number is ten juniors, as following:, Measuring the pulse rate.,Measuring the glucose rate in the blood.,Measuring lactic in the blood.

The used statistical treatments:

- The arithmetic mean,the mediator, Standard deviation., Coefficient of torsion,The correlation coefficient Man Wittny Labrometric test.,Wilcoxon Labarametric test.

First: The results:

Table 3

The differences between the two averages of the before and posteriori measurements of the first experimental group (Sauna) in the physiological variables included in the research (N= 5)

The variables	The advantageous group		Disadvantageous Group		Z value	The function level
	Grades' total	Grades' average	Grades' total	Grades' average		
The pulse	3.00	15.00	0.00	0.00	2.02	0.043
glucose	0.00	0.00	3.00	15.00	2.02	0.043
lactic	3.00	15.00	0.00	0.00	2.02	0.043

The table value of (Z) at (0.05) = 1.96.

Table 3shows that there are statistically differences between the before and posteriori measurements of the first experimental group (Sauna) in the physiological variables included in the research, these differences take the side of the posteriori measurement.

Table 4

The improvement percentage between the before and posteriori measurements of the first experimental group (Sauna) in the physiological variables included research (N= 5)

the variables	The average of the before measurement	The average of the posteriori measurement	The improvement rate %
Pulse	156.00	105.00	32.69
Glucose	82.00	94.00	14.63
lactic	3.98	3.08	22.61

Table (4) shows that the improvement rate of the first experimental group (Sauna) in the physiological variables ranged from (14.63: 32.69%), this indicates to the positivism of using Sauna in improving the physiological variables of the sample included in the research. It is also appears that the most improving physiological variables is the pulse (32.69 %) , whereas lactic came in the first place (22.61%) and glucose occupied the third place (14.63%).

Table 5

The differences' significance between the averages of the before and posteriori measurements of the second experimental group (the coldwater bath) in the physiological variables included in the research

The variables	The before measurement		The posteriori measurement		Z value	The function level
	Grades' total	Grades' average	Grades' total	Grades' average		
The pulse	3.00	15.00	0.00	0.00	2.03	0.043
glucose	0.00	0.00	3.00	15.00	2.03	0.043
Lactic	3.00	15.00	0.00	0.00	2.03	0.043

The table value of (Z) at (0.05) = 1.96.

Table 5 shows that there are statistically differences between the before and posteriori measurements of the second experimental group (the cold water bath) in the physiological variables included in the research, theses

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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differences were in the side of the posteriori measurements.

Table 6
The improvement percentage between the before and posteriori measurements of the second experimental group (the cold water bath) in the physiological variables included in the research (N= 5)

the variables	The average of the before measurement	The average of the posteriori measurement	The improvement rate %
Pulse	157.80	89.40	43035
Glucose	82.20	102.20	24.33
Lactic	3.88	2.02	47.94

Table (6) shows that the improvement rate of the second experimental group (the cold water bath) in the physiological variables ranged from (24.33: 47.94%), this indicates to the positivism of using the cold water bath in improving the physiological variables of the sample included in the research. It is also appears that the most improving physiological variables is the lactic acid (47.94 %) , whereas the pulse came in the second place (43.35) and glucose occupied the third place (24.33%).

Table 7
The differences between the two averages of the posteriori measurements of the first experimental group (Sauna) and the second experimental group in the physiological variables included in the research (N= 10)

The variables	The first group sauna		The second group (the cold bath)		Z value	The function level
	Grades' total	Grades' average	Grades' total	Grades' average		
The pulse	8.00	40.00	3.00	15.00	2.61	0.009
glucose	4.20	21.00	6.80	34.00	1.36	0.175
lactic	7.90	39.50	3.10	15.50	2.51	0.012

The table value of (Z) at (0.05) = 1.96.
Table 7shows that there are statistically differences between the two measurements of the first experimental group (sauna) and the second experimental group (the cold water bath) in the pulse and lactic, these differences take the side of the second group (cold water bath), whereas there are no statistically differences at the glucose variable.

Table 8
The improvement percentage between the posteriori measurements of the first experimental group (sauna) and the second experimental group (cold bath) in the physiological variables included in the research (N= 10)

the variables	The average of the first group (sauna)	The average of the second group (cold bath)	The improvement rate %
Pulse	105.00	89.40	14.86
glucose	94.00	102.20	8.72
lactic	3.08	2.02	34.42

Table (8) shows that the improvement rate of the first experimental group (sauna) and the second group (cold water bath) in the physiological variables ranged from (8.72: 34.42%), this indicates to the positivism of using the cold water bath which is better than sauna for getting the recovery and in its turn in improving the physiological variables of the sample included in the research. It is also appears that lactic acid is the most improving physiological variables (34.42%), whereas the pulse occupied the second place (14.86%) and glucose came in the last place (8.72%).

The results discussion and interpreting:

The first hypothesis stipulates that there are statistically differences between the before and posteriori measurements of the first experimental group (sauna) in the physiological variables at the gymnastics' juniors included in the research.

The results of table (3) indicate that there are statistically between the before and posteriori measurements of the first experimental group which used (sauna) in some of the physiological variables (the pulse- lactic- glucose) included in the research, these differences take the side of the posteriori measurement at level (0, 05), since the calculated value of (Z) is (2.02) and it is larger than the table value of (Z).

The results of table (5) showed the positive effect of using sauna on the sample of the first

experimental group in the physiological variables, since the results reveal that the pulse average in the before measurement after performing the motor action and before entering into the sauna reached (156ق\ن), whereas it decreased in the posteriori measurement after getting out the sauna to reach about (105 ق\ن), this refers to the improvement of pulse rate, since the percentage of improvement reached (32.69%).

On the other hand, we find that glucose rate in the before measurement after performing the motor action and before entering into the sauna reached (82.00), whereas it increased in the posteriori measurement after getting out of sauna to reach about (94.00%), this refers to the improvement of glucose rate in the blood, since the improvement rate reached about (14.63%).

The results referred that the average of lactic acid in the before measurement after performing the motor action and before entering into sauna reached (3.98 mille mole), whereas the average decreased in the posteriori measurement after getting out the sauna to reach (3.08 mille mole), this indicates to the improvement of lactic acid in the blood, since the percentage of the improvement reached (22.61%).

The researcher sees that the improvement of some physiological variables (the pulse rate- lactic acid- glucose) is resulted from using sauna, although the sauna increases body temperature, thus, increases the respiratory rate, in its turn it will increase the pulse rate, but the player in sauna will be completely relaxed, this will decrease and improve all physiological traits better than the junior's state after performing the motor action. This agrees with what J. Vanakoskio (1996) indicated that using sauna increases the absorption process and the metabolism, sauna also helps to enlarge the vascular, decrease the pulse rates and pressure and improves the speedy of recovery of sports persons.

Abu Ella Abdel Fattah (1999) indicated that the hypoglycemia is the basic danger that must be avoided, in particular through performing the sports activities, through taking glucose or any other drinks that contain carbohydrates. The danger of glucose deficiency is resulted from its effect on the brain needs to sugar, the matter which leads to what we called as the center roll fatigue.

These results agree with what was referred by Hamdey Abdo's study (2002), Alaa Abdel Aziem's study (2004) and J. Vanakoksio's study that using sauna as recovery mean affects positively on improving the level of the physiological traits at the practitioners of the sports activities.

Accordingly, the first hypothesis achieved which stipulates that there are statistically differences between the before and posteriori measurements of the first experimental group (sauna) in the physiological variables at the gymnastics' juniors included in the research.

The second hypothesis stipulates that there are statistically differences between the before and posteriori measurements of the second experimental group (cold water bath) in the physiological variables at the gymnastics' juniors included in the research.

The results included in table (5) indicate that there are statistically differences between the before and posteriori measurements of the second experimental group that used (the cold water bath) in the physiological variables (the pulse- lactic- glucose) included in the research, these differences take the side of the posteriori measurement at the abstract level (0.05), since the calculated value of (Z) reached (2.02) which is higher than the table value of (Z).The results included in table no. (5) revealed the positive effect of using the cold water bath on the sample of the second experimental group, this effect represented in the pulse rate\ minute, since the results indicate that the average of pulse rate in the before measurement after performing the motor action and before using the cold water bath has reached about (157.80\ minute), whereas it decreased in the posteriori measurement after getting out of the cold water bath to reach about (89.40\minute), this indicates to the improvement of pulse rate, since the percentage of improvement reached about (43.35 %).Table (5) also shows that the glucose average in the before measurement after performing the motor action and before using the cold water bath reached about (82.20), whereas it increased in the posteriori measurement after getting out of the cold water bath and reached (102.20), this indicates to the improvement in glucose indicator, since the percentage of increasing glucose in blood reached about (24.33%). The results included in table 7 revealed the positive effect of using the cold water bath on the sample of the second experimental group on the lactic acid rate in blood, since the results indicate that lactic rate in the before measurement and before using the cold water bath reached about (3.88), whereas it decreased in the posteriori measurement after getting out of the bath to reach (2.02), this indicates to the improvement of lactic rate in the blood, since the percentage of improvement reached about (47.94%).The researcher sees that the improvement of the second group juniors who used the cold water bath in the level of the physiological variables is resulted from the cold water, because the cold water affects positively on the nervous system and the junior's position in the bath makes him feeling with relaxation that in its turn leads to reduction and improvement of the physiological traits at the whole body after carrying out the motor action and before using the cold bath.

In this regard we find Mr. Abu Ella Ahmed Abdel Fattah (1999) and H. Seatan (1994) indicate that the cold bath is one of the most important means recovery means because of its positive effect on the physiological variables (the pulse- lactic- glucose). The study results agree with what I. Nagla' study indicated in (2003) and what was revealed through the study

made by Alaa Abdel azeem that revealed that using the cold water bath as recovery mean affects positively on improving the level of the physiological traits at the practitioners of the sports activities. The third hypothesis stipulates that there are statistically differences between the degrees' average of the two posteriori measurements of the first (sauna) and the second (cold bath) experimental groups, these differences take the side of the second group in the physiological variables of the gymnastics' juniors included in the research.

Table 7shows that there are statistically differences between the degrees' average of the two posteriori measurements of the first (sauna) and the second (cold bath) experimental groups in the level of the physiological variables (the pulse rate- lactic acid- glucose) included in the research, these differences take the side of the second group at the abstract level (0.05), since the calculated value of (Z) reached (2.61) which is higher than the table value of (Z).

The results of table no 7also indicates that the average of the posteriori measurement (after using sauna) of the first experimental group at the pulse rate reached (105.00), whereas the average of the posteriori measurement (after using the cold bath) of the second experimental group reached (89.40). the improvement rate reached (14.86%) for the side of the second experimental group. The results of table 9 also reveals that the average of the posteriori measurement of the first experimental group which used sauna in blood's glucose reached (94.00), whereas the average of the posteriori measurement of the second experimental group which used the cold bath reached (102.20), the improvement rate reached (8.72) for the side of the second group. Table 7 also shows that the average of the posteriori measurement of the first experimental group which used sauna in lactic rate in blood reached (3.08), where as the average of the posteriori measurement of the second experimental group which used the cold bath reached (2.02), the improvement rate reached (34.42%) for the side of the second group. The researcher attributes the superiority of the second experimental group in the physiological variables (pulse rate- glucose- lactic acid) to te water bath, because the cold bath, , because the cold water affects positively on the nervous system and the junior's position in the bath makes him feeling with relaxation that in its turn leads to reduction and improvement of the physiological traits at the whole body after carrying out the motor action and before using the cold bath. In this regard we find Mr. Abu Ella Ahmed Abdel Fattah (1999) and H. Seatan (1994) indicate that the cold bath is one of the most important means recovery means because of its positive effect on the physiological variables (the pulse- lactic- glucose). The study results agree with what I. Nagla' study indicated in (2003) and what was revealed through the study made by Alaa Abdel azeem that revealed that using the cold water bath as recovery mean affects positively on improving the level of the physiological traits at the practitioners of the sports activities

Conclusions:

In the light of the research results and the limitations of the research sample, its characteristics, the used methodology and the followed statistical analysis we could get the following conclusions:

1- Using sauna as recovery mean leads to positive physiological variables in the pulse rate, glucose rate and the rate of lactic acid, since we found that there are statistically differences between the before and posteriori measurements for the side of the posteriori measurement as the following:

- The pulse rate improved and decreased after using sauna as recovery mean with rate (32.69%).
- The rate of lactic in blood improved and decreased after using sauna as recovery mean with rate (22.61%).
- Glucose rate improved in the blood and increased after using sauna as recovery mean with rate (14.63%).

2- Using the cold bath as recovery mean leads to positive physiological variables in the pulse rate, glucose rate and the rate of lactic acid, since we found that there are statistically differences between the before and posteriori measurements for the side of the posteriori measurement as the following:

- The pulse rate improved and decreased after using the cold bath as recovery mean with rate (47.94%).
- The rate of lactic in blood improved and decreased after using the cold bath as recovery mean with rate (43.35%).
- Glucose rate improved in the blood and increased after using the cold bath as recovery mean with rate (24.33%).

3- Using the cold bath as recovery mean is better and faster than using sauna for retaining the recovery because of its better positive effect on the physiological variables (lactic- glucose- the pulse).

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Vol. XII, ISSUE 2 Supplement 2012, Romania
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ANALYSIS OF SELECTED INTERNATIONAL AND NATIONAL COACH EDUCATION PROGRAMMES

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Abstract

Purpose: The purpose of this research paper was to analyze selected international and national coach education programs in order to summarize the key features of common coach education approaches around the world, sharing examples of international coach education system structures, to illustrate similarities and differences in global developments, in order to broaden understanding of global trends.

Methods: Examples of international coach education system structures have been shared to illustrate similarities and differences in global developments, and to broaden understanding of global trends. In addition, the case studies discussed here involved travelling to attend different international and national coach education courses, keeping field journal notes (FJN), and gathering documents to review systems. These systems were described and critiqued, comparing the following points: accreditation structure, modes of delivery, generic/specialization systems and management.

Results: The international and national cases provide further learning possibilities by identifying the strengths and challenges of other systems, critiquing them in relation to advantages and disadvantages of globalization and using outcomes to build foundation principles for the development proposal for coach education in other countries. This research also provides suggestions which help organizing international coach education programs better. Conclusion: It was concluded, that each sports organization should establish quality control of educational programmes for sport coaches according to their own financial, political and cultural situations, and they should seek to continually improve the quality of the coach education process and ensure that coaches have on-going pathways for further development.

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Key Words: Sport, Coach Education.

Introduction

With the global migration of coaches and athletes, coaching knowledge, skills and understanding also undergo constant exchange, development and refinement at international level. Increasing numbers of systematic coach education programmes are being developed around the world (Bale, 2007; ICCE. 2009). There is not yet a global coach education system that is accessible to interested people in all countries. Would it be desirable or useful if there were?

This research analyses and summarizes the key

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Received 09.05.2012 / Accepted 11.08.2012

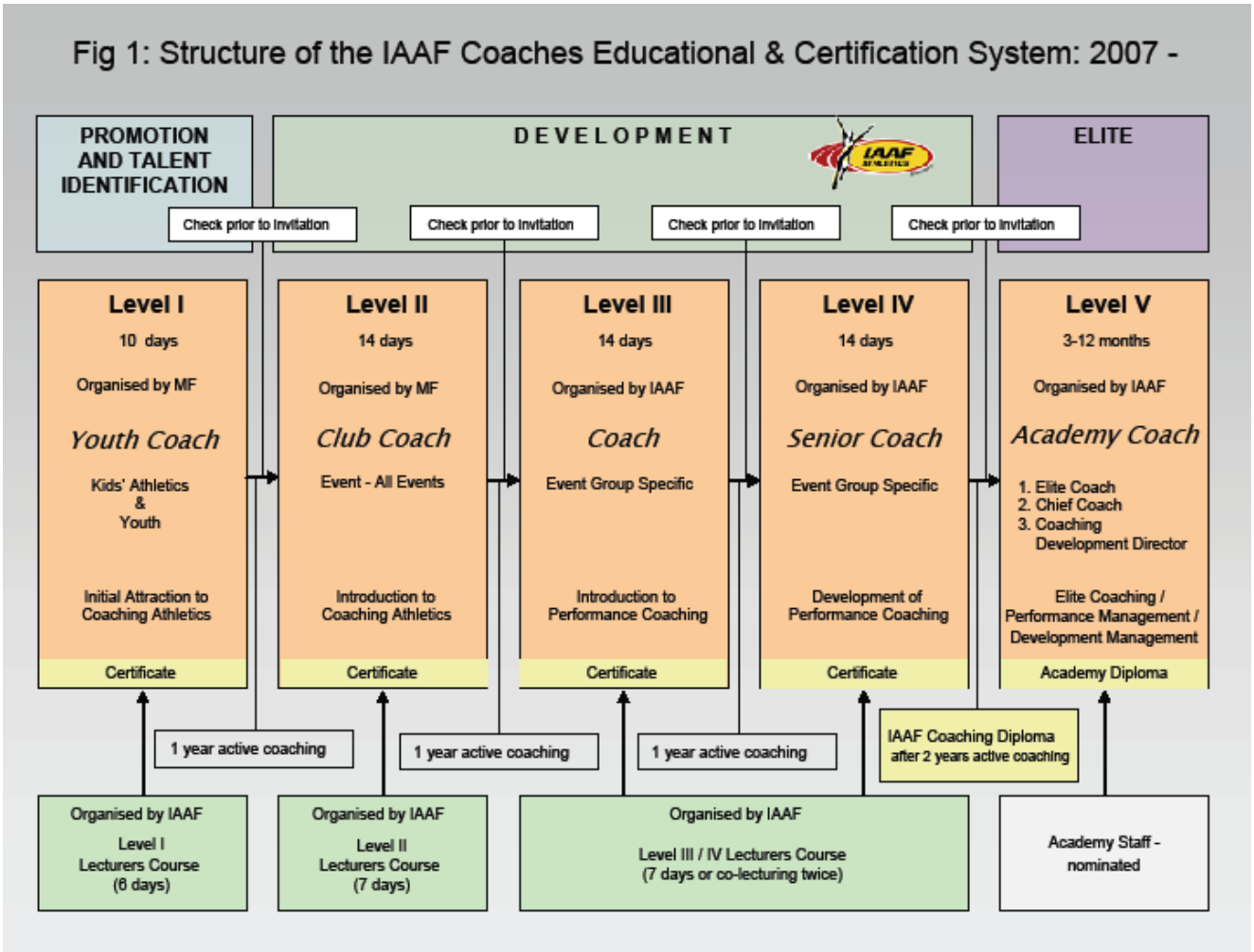
features of common coach education approaches around the world. Examples of international coach education system structures will be shared, to illustrate similarities and differences in global developments, in order to broaden understanding of global trends. There is a need to explain the gap between the current coach education situations in some countries, which includes a global review of coach education systems. Finally, it is important to reflect on how an understanding of sport globalization and aspects of current systems informs the research to develop recommendations in order to build a right coach education system. The case studies discussed here involved travelling to attend different international and national coach education courses, keeping field journal notes (FJN), and gathering documents to review systems. The international and national cases provide further learning possibilities by identifying the strengths and challenges of other systems, critiquing them in relation to advantages and disadvantages of globalization and using outcomes to build foundation principles for the development proposal for coach education in other countries.

International Coach Education Programmes

There is an agreement that undertaking training as a coach is an important step in ensuring coaches are providing quality coaching to their participants (Debanne and Fontayne, 2009; Levy *et al*., 2009). With increasing global expectations of standards and achievements in sport, the quality and credibility of coach education must be high, and responsibility lies with sport organizations. Despite global trends, many countries and sport organizations have developed their own coach education programmes and systems. For example, some coach education systems are provided by international sports federations to improve the knowledge of their coaches. In addition, coach education systems are provided for one continent, such as the coaching qualification system in Europe. The European Structure for the five levels of coach training was produced in 1999 as a common framework for the recognition of coaching qualifications as a requirement for the free movement of labour among European Union countries (Bale, 2007). A coach education framework has also been, and is still being, developed for the African continent (SCSA, 2010). Additionally, coach education systems are sometimes provided in a single country for its local coaches such as the Hungarian coach education programme. Some countries have no structured coach education programme, such as Oman, and a small number of these countries have recently adopted foreign coach education programmes in order to develop their national coaches, such as Qatar and Bahrain. However, the success of adopting such systems has not been evaluated to date. Some federal countries, (such as the USA) also have no united structured coach education programmes; instead individual States have adopted their own coach accreditation programmes. Such programmes have also been criticized. Gilbert *et al*. (2009) argue that, despite having nearly 60 million youth sport participants, the United States has no national coach education system. Individual States (and sports) are left to design and teach their own versions of coach education, resulting in a wide array of untested programmes. Therefore, it is suggested that there is a need for a framework for establishing a national learning community for youth sport coach education in the United States (Gilbert *et al*., 2009), that should be in line with global trends.

Coach education programmes follow different accreditation level structures. The providers of these programmes (national or international) are also constantly updating the structures according to the new needs of their sport and coaches, as well as national sporting frameworks. Some of the international sports federations were following a 3-level structure and have changed to a 5-level structure. The advantage of a 5-level structure is to maximize the opportunities for providing qualified coaches at all levels of sports programmes from ‘sport for kids’ to ‘elite level’. To give a specific example, the International Association of Athletics Federations (IAAF) operates a Coaches Education and Certification System (CECS) (Figure 1). While it used to have a 3-level structure, from March 2007 the CECS has featured five levels of courses operating in seven languages. The first author of this research studied levels 1 and 2 of the IAAF coach education 3-level structure before 2007. Then, and because they have established the 5-level structure, I transferred to study level 5 in 2007 (FJN). For each course level, the IAAF provides a standard syllabus, qualified lecturers and the necessary learning support materials. Financial resources for the system come from the IAAF and its area associations, Olympic Solidarity and other partners at international and national levels, as well as self-funded options at the higher levels. The operation of CECS is co-ordinated by the IAAF Member Services Department (MSD) and the IAAF Regional Development Centres (RDCs) (IAAF, 2012; RDC Cairo, 2012).

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning



Source: Adapted from IAAF (2012)

Figure 1: Structure of the International Association of Athletics Federations (IAAF) for Coaches Educational and Certification System

Such systems impact on sport development by giving coaches around the world, where they can gain access to a course, an opportunity for continuing education. For example, athletics coaches in Oman have opportunities to join the IAAF educational programme. However, only 39 athletics coaches have joined and only a few of them are working in the field. On the other hand, many Omani athletics coaches – as coaches in other sports - are working in the athletics field and have no coaching educational qualification (O.A.A, 2012).

As mentioned earlier, some international sports federations provide coach education programmes to qualify and accredit their coaches. However, there are other global international coaching programmes. Some of these programmes are offered to any coach around the world and others are offered only to coaches from developing countries. These programmes are designed to accept coaches from different sports, providing generic skills in different languages. For example, an international coaching course run by Leipzig University in Germany is offered to coaches from developing countries. Financial resources for the programme come from the Ministry of Foreign Affairs of Germany. The participants come from different countries to spend five months together to gain knowledge in many areas of sports science (Leipzig University, 2012). In 2006, first author of this research attended this course and met coaches from many different countries. The course was an opportunity not only to gain coaching experiences, but also to identify different coach education systems through meeting other coaches (FJN). However, there are some weaknesses that should be taken into consideration during the conducting of such courses. Some developed countries also provide educational help by sending their coaching lecturers to developing countries to qualify sports coaches.

Another example is the International Coaching Course organized by the Institute of Coaching and Sport Education (ICSE) in Hungary and supported financially by Olympic Solidarity in International

Olympic Committee (IOC). Since its establishment in 1971, 1084 coaches from more than 80 countries and from all continents have participated in this course (ICSE, 2012). This course is designed to train and educate coaches worldwide. It provides coaches with a systematic way to improve their knowledge and skills in the theoretical, technical and practical aspects of coaching. The course is organized at half-yearly intervals starting every March and September, and usually 10-15 sports are offered. The course is given exclusively in the English language. As a result of its long term activity in international coaching education, this course has been recognized by the International Olympic Committee, which gives scholarships for coaches from developing countries to attend the course. While the first author of this research was attending this course in 2009, different sports subjects were conducted which I (and other coaches) had never studied before in our own countries, such as sports sociology. Accessing such subjects is considered one of the advantages of an international coach education system which supports the direction of global coaching curriculum (FJN).

Indeed, such international coaching programmes are examples of global attention to coach education. The greatest advantage of these international coaching courses is that they bring many coaches from different nations to one place to share coaching ideas. Therefore, they perpetuate the centralization and globalization of coaching theories and practices. As it is difficult for coaches from developing countries to update their coaching knowledge, these programmes are a good way to exchange new ideas. In addition, as English has become a global language (Hobson, 2009), such courses give a new opportunity for coaches to improve their English for sport, opening new knowledge transfer opportunities for them (FJN).

More critically, many considerations should be taken into account when organizing such international coach education programmes. For example, coaches should be prepared to face a new educational system that is most likely to be different from that in their own countries, and to meet and work with coaches from many different cultures and countries. In addition, as all coaches in the course study one curriculum level, there is a need to audit participants' education backgrounds and match needs and curricula. In reality language, cultural diversity and catering for differentiated needs are some of the challenges of such provision (FJN). Despite the time and money spent on such globally centralized coach education programmes, there is still no research to evaluate the impact they have when coaches return to their situations.

From the evidence available, it appears there are increasing efforts to move towards a global qualification framework or set of standards. As provision on the scale increases, and many international organizations are now providing coach education programs, there is also a need to increase cooperation and negotiation to reduce redundancy between overlapping accreditation programmes. For example, there is a need to coordinate and recognize the qualification roles of the national and international sectors. Nationally, the coordination and recognition of the roles of non-university and university sectors are also to be encouraged. In addition, providing general guidance to countries, institutions and federations in order to develop their coach education programmes are needed (Bale, 2007). Finally, the information revolution – as a result of globalization – should be used to inform coaches around the world of all education opportunities and to communicate globally. For example, a global website will help to overcome the lack of communication between some countries - such as Oman - with international sports organizations in order to better benefit from the global opportunities (FJN).

National Coach Education Programmes

Coaching is a complex process (Galipeau and Trudel, 2006; Knowles *et al*., 2006) and coaches need to develop a wide range of skills and knowledge to help prepare them for their important role. Therefore, to carry out their work effectively, coaches need proper education and training. The provision of national large-scale coach education programmes, as a result, is now available in many countries and national sports federations (Lyle, 2002; Wright *et al*., 2007; Gilbert, 2009; Kidman *et al*., 2009; Mallett *et al*., 2009). The reason behind these unprecedented efforts around the world to develop and revise national coach education programmes is to contribute to the development of coaching as a profession and to certify and accredit sports coaches (Rynne *et al*., 2006; Gilbert, 2009; Mallett *et al*., 2009).

Examples of these large-scale programmes are the National Coaching Certification Programme (NCCP) in Canada, the National Coaching Accreditation Scheme (NCAS) in Australia, and the United Kingdom Coaching Certificate. These programmes share similar characteristics, including having different levels and having defined content for each level. Also, in order to apply the coaching ranking system, some countries require formal training, exams, certificates, licensing and amateur coaches. William (1995) notes that, in most nations, coaching education and certification programmes are centralized nationally, usually planned and operated under the auspices of the national government. He also notes that there are four approaches to sport coaching certification that are currently used in most nations:

1- National certification by the individual sport (for example, by the National Governing Body)
2- National certification by an all-sports coaching education group.
3- National licensing by a governmental agency (for example, in Japan).
4- Local licensing by a governmental agency (for example, in the United States).

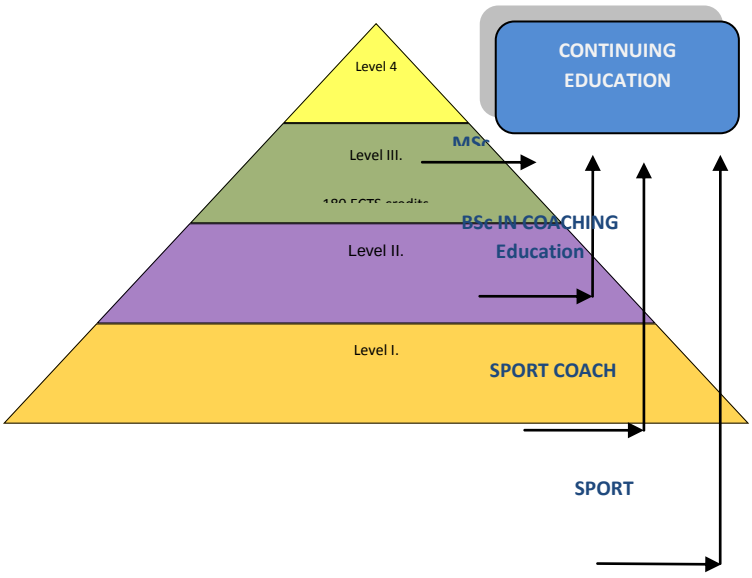
This section presents a comparison of national coach education systems from six different countries: Australia, Ireland, New Zealand, Singapore, Hong Kong**,** and Hungary. The main aim of presenting these systems is to identify any global trends of similarity, and difference, in order to provide a foundation of understanding to underpin the ensuing research investigation to develop the future coach education systems. All six countries have different coaching systems, modules, or programmes. They have been chosen in order to identify similarities, differences and trends in coach education systems and programmes, coaching strategies, courses, coach ranking and certification programmes. There are many reasons for choosing these particular systems. Firstly, in order to obtain different experiences, some of these systems are from western countries and the others are from developing countries. All of these systems have clear structures and are easy to follow. In addition, most of these systems have documents that are available on the internet and are therefore easy to access. To make this analysis relevant to the aims of this study, these systems will be described and critiqued, comparing the following points: accreditation structure, modes of delivery, generic/specialization systems and management.

Accreditation Systems

Professional accreditation is the process of verifying that professional preparation is of sufficient quality to ensure that those completing such preparation will engage in safe and appropriate practice. Independent certification programmes may verify that participants have completed an identified unit of information or developed specific skills, but the certification does not address the quality or appropriateness of the specified curriculum or preparation (NCACE, 2012).

Generally, there are some differences regarding the accreditation structure in the six coach education programmes. In Australia, for example, the previous NCAS (the National Coaching Accreditation Scheme) framework required sports to conform to a three-tier structure (levels 1, 2 and 3). However, the NCAS now has a more flexible approach that allows each national sporting organization to determine the number and names of levels in their coach accreditation pathway (Australia Sports commission, 2008). Conversely, in Ireland and Hungary, there is a four level coaching ladder in place (Figures 2 and 3).

Figure 2: Hungarian Coaching Education Structure



Source: Adapted from Petrovic (2012)

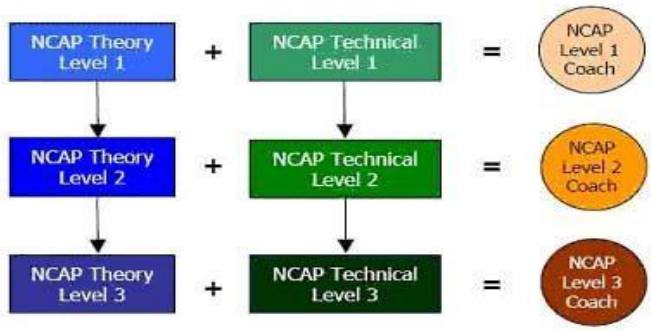
Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengage Learning

Figure 3: Coach Development Model in Ireland

Source: Adapted from Coaching Ireland (2012)

On the other hand, in New Zealand and Singapore there are three-tier structures. In New Zealand for example, there is a coach accreditation programme for all levels of development from the beginner (Getting Started) through to coaching performance athletes (level 3) (Sport and Recreation New Zealand, 2008). Although Singapore also has a three-tier structure, it is different to that in New Zealand. Coaches in Singapore can obtain certification at three levels, but to be a fully certified coach at any particular level, the coach needs to be certified in NCAP Theory (National Coaching Accreditation Programme) and in NCAP Technical at that level. For example, a coach is considered a Level 1 coach only when he or she has both NCAP Theory Level 1 and NCAP Technical Level 1 certifications (The Singapore Sports Council, 2010) (Figure 4).

Figure 4: National Coaching Accreditation Programme (NCAP)
(Basic Coach Education Framework)



Source: Adapted from the Singapore Sports Council (2010)

Additionally, the CAP (The Foundation Coach Accreditation Programme) is concerned with the development and accreditation of coaches in Hong Kong and operates at three levels. Each level consists of four parts: A (Sports - General Theory), B (Sport-Specific Theory), C (Sport-Specific Practical) and D (Sport-Specific coaching experience) (The Hong Kong Coaching Committee, 2011). It is necessarily to recognize that some coaching systems in these six countries provide other coaching courses such as courses to coach athletes with a disability. These kinds of courses are designed to increase understanding and awareness of athletes with a disability and the special considerations associated with coaching disability athletes.

Finally, it is worth noting that the coaching world is debating not only how to educate sports coaches, but also how to accredit them. Part of the debate revolves around whether sports coaches should or can be given credit for the informal learning that they are engaged in while they practice. Indeed, the

degree to which informal education should be included in coach education and accreditation is less clear (Reade, 2009). Therefore, further work and more widespread debate are needed to gather more information about including informal education in designing coach education frameworks. Generally, in addition to the previous accreditation experiences mentioned in this section, and according to NCACE (2012), accreditation of coaching education should:

1. Identify levels of coaching education that are acceptable by both a systematic and scientific inquiry as well as identify a national consensus of what coaches should know, value, and be able to do.

2. Hold coaching educators accountable for the quality of professional education and ensure that the mechanisms involved in the accreditation process are of appropriate quality.

3. Promote coaching education programmes that are effective in serving the needs of a dynamic social system and that are creative and responsive to the changing needs of prospective coaches.

4. Be precise in gathering key information about critical aspects of educational quality, both in scope of programmes and reliability of judgments and conclusions.

5. Create consistent, efficient, and cost-effective review procedures and processes by which decisions are made and maintain supportive relationships to allow for all levels of coaching education to seek accreditation**.**

Modes of Delivery and Content

There are also differences regarding the modes of delivery and the content in the six coach education programmes. There are a number of ways of undertaking training as a coach in NCAS in Australia, including face to face courses, online training and working with mentor coaches. Accredited coaches in Australia receive a range of benefits, including coaching courses, workshops and publications, and regular e-newsletters and information. NCAS training programmes in Australia include the following components:

- Coaching general principles, generic principles of coaching and athletic performance that apply to all sports.
- Sport specific skills, techniques, strategies and approaches to the particular sport (Australia Sports Commission, 2008).

In Ireland, education specific to each sport is provided for coaches. Course descriptions in this programme are crucial in laying down the skills and knowledge required by coaches at each level (Rynne *et al*., 2006; Coaching Ireland, 2012; National Coaching and Training Centre, 2011). In New Zealand, coaches are also involved in courses focusing on generic coaching principles which seek to complement sport-specific programmes (Sport and Recreation New Zealand, 2008). However, as there are two steps to becoming a fully certified coach at any particular level in Singapore, there are two different coaching courses (theoretical and technical courses) containing workshops and lectures on sports and coaching specific skills (The Singapore Sports Council, 2008). In Hong Kong, the coaching programme consists of coaching courses, seminars and workshops (Table 1) (The Hong Kong Coaching Committee, 2010). The longest period of delivery is in Hungary where the course duration is from one to three years depending on each level. The coaching progrmme also requires completion of both theory and practical/technical components

.

Table 1: Curriculum of the Hong Kong Foundation Coach Accreditation Programme

Module	Number of Lecturing Hours		
	Level 1	Level 2	Level 3
Sports Science	**15**	**20**	**26**
1. Concepts of Fitness			
2. Sports Physiology			
3. Sports Psychology			
4. Sports Biomechanics			
5. Sports Nutrition			
6. Motor Control and Learning			
7. Talent Identification			
Sports Coaching	**6**	**7**	**7**
8. Planning the Programme			
9. The Practice of Coaching			

10. Adapted Sports			
Coaches Management	**2**	**2**	**4**
11. Managing Skills for Coaches			
12. Legal Aspects in Sports Coaching			
Sports Medicine	**4**	**4**	**8**
13. Safety, Injury Prevention and Rehabilitation			
14. Doping and Sport			
Total	**27**	**33**	**45**

Source: Adapted from the Hong Kong Coaching Committee (2011)

Generic/Specialization systems

It is important that the information provided in the course is specific to one sport. Providing coaching courses for coaches from the same sport gives more opportunities to enrich the knowledge of that sport. Generally, all six coaching systems work the same with specialization. In Australia, the coach education programme offers courses at various levels with over 70 sports participating (Australia Sports Commission, 2008). The coach education programmes in Ireland, New Zealand, Hungary, Singapore and Hong Kong offer coaching courses for each level for each sport that is practised in the country (Sport and Recreation New Zealand, 2008; The Singapore Sports Council, 2008; The Hong Kong Coaching Committee, 2011; National Coaching and Training Centre, 2011; Coaching Ireland, 2012; ICSE, 2012; Petrovic, 2012).

Responsibility for the Management of Coach Education Programmes

Some coaching systems are politically driven while others are driven by academic organizations, with still others driven by sports organizations. In Australia, for example, coaches become accredited through the National Coaching Accreditation Scheme (NCAS), which is an initiative of the Australian Sports Commission (ASC) (Australia Sports Commission, 2008). In Ireland, coaches become accredited through The National Coaching Development Programme (NCDP) (Coaching Ireland, 2012; National Coaching and Training Centre, 2011), and in New Zealand coaches become accredited through National Sport Organizations (NSO) but programmes must be endorsed by Sport and Recreation New Zealand (Sport and Recreation New Zealand, 2008; Misener and Danylchuk, 2009). In Singapore, coaches become accredited through the Singapore Sports Council Coaching and Technical Development Division via the National Coaching Accreditation Programme (NCAP) (The Singapore Sports Council, 2012; Koh. *et al*., 2009). Finally, the Institute of Coaching and Sport Education manages the coach education system in Hungary (CEH, 2009).

Conclusion and Recommendations: Lessons from Global Review of selected Coach Education Programmes

It is clear that there are some differences between the six coaching systems described above. There are differences in coach accreditation and categories of accreditation, curriculum and management, as well as the modes of delivery, while there is similarity in applying specialization. These differences have occurred because each of these countries has structured a coach education programme that is suitable for its situation and financial, political, cultural context, as well as the geographical spread of the population (Table 2).

Table 2: The differences and similarities between some existing coaching systems in the world

	Australia	Ireland	New Zealand	Singapore	Hong Kong	Hungary
Accreditation Structure	Flexible approach that allows each national sporting organization to determine the number and names of levels in their coach accreditation pathway	Four levels	Three levels	Three levels	Three levels, each level consists of four parts (A, B, C & D)	Four levels: 2 vocation-al levels and 2 levels in higher education

Modes of delivery and contents	Face to face courses, online training and working with mentor coaches, publications, and access to regular e-newsletters and information, receive a coach identification card and sport specific benefits	Course descrip-tions in this pro-gramme are crucial in laying down the skills and knowledge required by coaches at each level.	Courses with academic supports	Work-shops and lectures on sports specific skills (theory and technical courses)	Coaching courses, seminar and workshops	Work-shops and lectures on sports specific skills (theory and technical courses)
Generic/ Special-ization systems	Over 70 sports participating, Coaching general principles and sport specific skills	Provide a firm basis for the continuity and review of coach education pro-grammes within each sport	Courses for each level for each sport	Courses for each level for each sport	Courses for each level for each sport	Courses for each level for each sport
Responsible of the coaching system	National Coaching Accreditation Scheme (NCAS) which is an initiative of the Australian Sports Commission (ASC)	The National Coaching Develop-ment Pro-gramme (NCDP)	National Sport Organ-izations	The Singapore Sports Council Coaching and Technical Develop-ment Division	The Hong Kong Coaching Comm-ittee	High education institutes

In conclusion, the review of selected coach education programmes around the world (nationally and internationally) provides some useful suggestions. The accreditation of coaching education programmes, for example, ought to be designed to provide consistent and scientifically-based guidelines by which to assess: (a) the content of programmes for the education of sports coaches; (b) the qualifications of instructors who provide coaching education; and (c) the process by which coaching education is provided. Coach education programmes should be focused on the development of appropriate skills, knowledge, and values needed to function as a coach (NCACE, 2012). In addition, each sports organization should establish quality control of educational programmes for sport coaches according to their own financial, political and cultural situations, and they should seek to continually improve the quality of the coach education process and ensure that coaches have ongoing pathways for further development. Also, they should increase the recognition and status of coaches to ensure they are valued and that coaching is seen as a rewarding experience. Additionally, any coach education system should be evaluated and revised from time to time to meet the new needs of coaches. Prospective expert reviewers include individuals from different organizational groups, such as multi-sport organizations, science/medical/educational organizations, single sport groups and distributors of coaching education.

Finally, prospective coaches must seek quality accredited coach education programmes that enable them to understand hiring practices and to meet appropriate certification requirements related to becoming a qualified coach. Accreditation of coach education encourages individuals, particularly at the volunteer level, to aspire to the qualifications that are appropriate for coaching athletes at all levels of development (NCACE, 2012). Therefore, any sports organizations should be committed to providing training and resources to help their sports coaches develop and share their knowledge.

One of the biggest issues recognized after reviewing the above systems is coach education assessment and effectiveness. In other words, is there any notable impact on sports coaches and coaching as a result of investment in coach

education? Unfortunately, there is very little research on this issue. One of the only published studies in which a large-scale coach education program was evaluated is a pilot study published by Gilbert and Trudel (1999) entitled "An evaluation strategy for coach education programs". The evaluation used in this study focuses on three stages that relate to course delivery, knowledge gain and knowledge use. The study concluded that the evaluated course was not delivered as designed, no new knowledge was gained and both use and non-use of knowledge was evident in the field.

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RESEARCHES REGARDING THE RELATION BETWEEN THE KINEMATIC PARAMETERS MEASURED DURING THE COMPETITION AND THE OBTAINED PERFORMANCE

MIHAI ILIE[1]

Abstract

Purpose. The kinematic analysis represents one of the important issues that are approached in the world high performance track and field technique improvement of the triple jump event for men or women. The purpose of this study was to identify the connection between the kinematic parameters measured during competition and the performance obtained in the competition.

Methods. The research was achieved by using the kinematic analysis of some technical aspects of the male triple jump event and then the results obtained by implementing the Dartfish kinematic analysis software were correlated.

Results. There was a correlation between the kinematic parameters values and the performance obtained in competition regarding the length of the last two running steps, the position of the BMC and the specific angles of the event.

Conclusions. The obtained results may represent means of technical monitoring of the male triple jump event that can help the coaches to achieve the improvement of this event technique.

Key words: kinematic analysis, performance triple jump.

Introduction

Sports performance value represents the result of some continuous, efficient and effective activities, rigorous organized and always tailored to the requirements of performance sports.

Their significance can constitute an instrument for assessing the development of athletes, on the one hand, from the moment of sport beginning until the time of withdrawal, and on the other hand may be formed into a directing tool of the sportive training program content.

"Measurements play a big role in judging the performance: races can be lost by hundredths of a second or field events by fractions of a millimeter.

A photo finish may capture that fractional moment pictorially, and can be used to decide the winner, but it does not help us to compare one athlete's performance with his/her own personal best or with someone else's in previous competition."(http://www.metrologycareers.com/pdf/Measurement-in-Sport.pdf, 26. 03.2012).

Successful performance in any sport is multifactorial. Objective testing of physical, physiological, or skill performance may provide some insight for talent identification and possibly

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Email: ilie112004@yahoo.com
Received 10.05.2012 / Accepted 18.08.2011

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

define positional specificity (J.D. Vescovi, T.M. Murray, L.J. Van Heest, 2006).

Robotics, physics, mathematical analysis, imaging, motion capture and computer simulations are some of the latest tools in the quest to improve athletic performance.

Together they are used in the study of biomechanics-the physiological analysis of the interaction of forces and effects of forces on and within the human body. Biomechanics researchers are able to examine each aspect of a movement to enhance performance and to understand the mechanisms of injury (http://www.shlnews.org/?p=89, 26.03.2012).

To produce coordinated movements patterns, the characteristics that define these patterns need to be acquired.

The ability to quantify this coordination or coupling relationship between segments or joints is extremely useful in the analysis of human movement but can be problematic (C. Wilson et. al., 2008).

Variability in movement is particularly important in the many sport skills in which the adaptability of complex motor patterns is necessary within dynamic performance environments (C. Button, K. Davids, W. Schollhorn, 2006).

Motion capture is the preferred analysis method in a wide range of sports applications in research, rehabilitation, physical education and practice.

Physical limitations and movement optimization are of great interest to athletes, coaches, researchers and doctors. In addition to biomechanical studies, motion capture can be used to show how external, psychological factors affect balance, movement ability and performance (http://www.qualisys.com/applications/biomechanics/sport-science/)

Precise measurement of motion has been already incorporated into training routines of numerous professional sport teams in order to improve sportsmen performance (V. Porada, D. Simsik, et al., 2010).

Precise measurement of motion patterns proved itself to be particularly efficient in athletics, where even a small alternation of motion pattern can significantly influence the outcome performance (L. Szerdiová, D. Simšik, Z. Dolná, 2012)

By carrying out this research I considered that by measuring some kinematic parameters during the competition may represent an objective mean of sportive technique monitoring with positive influences on the obtained performance.

The aim of this study was to identify the connection between the kinematic parameters measured during competition and the performance obtained in the competition..

Method

The subjects involved in this research were the finalists of the male triple jump event, participants that participated to the 2012 Indoor Athletics National Championship, senior's category, components of the Athletics National and Olympic Team of the Athletics Romanian Federation.

The experimental approach of this scientific research consisted of:

- the establishment of the kinematic parameters aimed in the research (the length of the last running step on the approach, the height of the body mass center in the touch-down contact, the contact angle, the touch-down angle and the take-off angle;
- the positioning of a video camcorder on one side of the touch-down board in order to include in the filming angle the last running steps of the approach, the first touch-down phase as well as it's take-off;
- the recording of the images that capture the technical aspects that were previously presented;
- the processing of these images by using the movement kinematic analysis software called Dartfish ProSuite, v. 5.5, in order to determine the kinematic parameters that were aimed.

The main research methods that were used in order to achieve this scientific research were: references method, kinematic analysis method, case study, etc.

Results

Table 1. The value of the analyzed kinematic parameters and the obtained performance

No	Kinematic parameters	Athletes				Av.	S.D.	C. Var. (%)
		1	2	3	4			
1	The length of the last running step on the approach (m)	2.03	2.17	1.79	2.05	2.01	±0.14	6.86
2	The height of the body mass center in the touch-down contact (m)	0.99	0.93	0.91	0.93	0.94	±0.03	3.19

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
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3	The contact angle (degrees)	75.6	79.1	75.45	78.3	77.11	±1.61	2.09
4	The touch-down angle (degrees)	70.6	59	71.3	60.4	65.33	±5.65	8.65
5	The take-off an (degrees)	14.2	12.5	15.2	12.7	13.65	±1.11	8.13
	Competition performance (m)	**16.97**	**16.16**	**16.08**	**15.59**	-	-	-

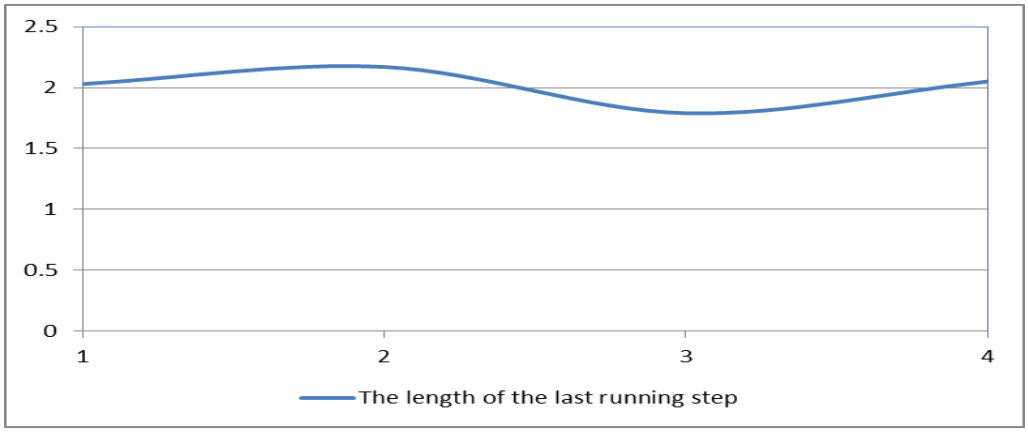

Figure 1. The dynamic of the last running step on the approach

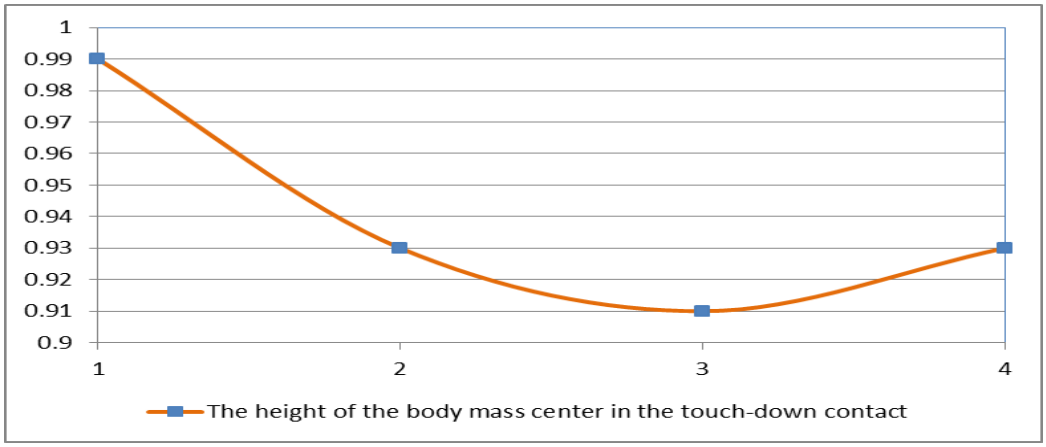

Figure 2. The dynamic of the height of the body mass center in the touch-down contact

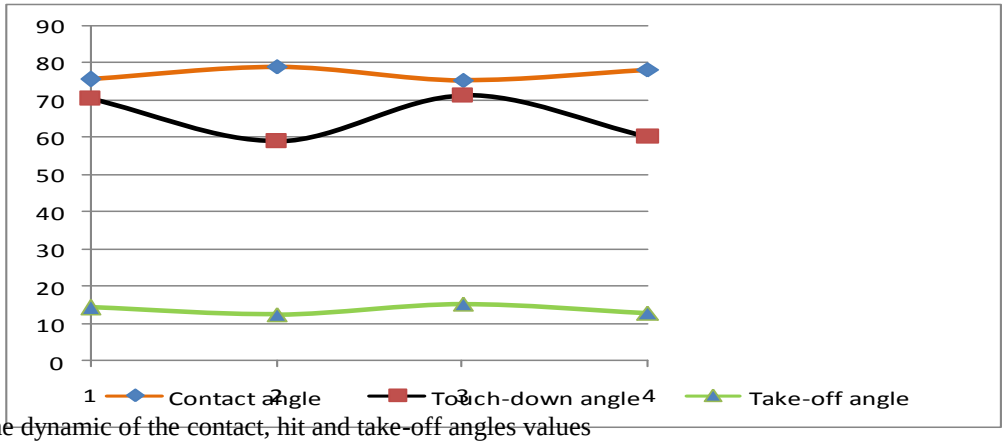

Figure. 3. The dynamic of the contact, hit and take-off angles values

Discussion and conclusion

After the images processing and kinematic parameters determining specific to the male triple jump event that were aimed in this research, we can observe the following aspects:

- regarding length of the last running step on the approach, this recorded an average of 2.01m, with a standard deviation of ± 0.14 m and a variability coefficient of 6.68 % (table 1, figure 1);
- regarding to the height of the body mass center in the touch-down contact, this parameter recorded an average of de 0.94 m, with a standard deviation of ± 0.03 m and a variability coefficient of 3.19 % (table 1, figure 2);
- from the perspective of the angles that are specific fro this track and field event (the contact angle, the touch-down and the take-off angle) they presented the following values (table 1, figure 3):
  - *the contact angle* – recorded an average of 77.11^0, with a standard deviation of $\pm 1.61^0$ and a variability coefficient of 2.09 %;
  - *the touch-down angle* – presented a dynamic having an average of 65.33^0, a standard deviation of $\pm 5.65^0$ and a variability coefficient of 8.65%;
  - *the take-off angle recorded an average of* 13.65^0, with a standard deviation of $\pm 1.11^0$ and a variability coefficient of 8.13 %

The analysis of the data obtained from the research approach emphasizes the fact that the recorded values of the involved athletes' presents an outlined trend comparing with the specialty literature in the case of contact and touch-down angle, while the take-off angle describes a trend between these limits.

Regarding to the height of the body mass center in the touch-down contact, the recorded value is higher than the one stated in the Romanian and foreign literature (I. Mihai, 2009, P. Susanka et. al., 1990), making the mention that one of the factors that can determine this unlike may be the difference of the athletes' height knowing that the position of the body mass center is influences by the height size (I. Mihai, 2011).

By calculating the correlation coefficient (table 2, figure 4) concerning the relation between the values of the kinematic parameters measured and analyzed in this scientific research and the performance obtained in competition it can be emphasized that in four of five correlation situations, the correlation coefficient presents positive values (0.04; 0.82; 0.59; 0.39): the length of the last running step on the approach, the height of the body mass center in the touch-down contact, the touch-down angle and the take-off angle. At the opposite side, the contact angle presents a negative value of the correlation coefficient with the performance obtained in the competition, meaning – 0.55.

Table. 2. Correlation coefficient (r – Pearson)

No	Kinematic parameters	Correlation coefficient
1	The length of the last running step on the approach	0.04
2	The height of the body mass center in the touch-down contact	0.82
3	The contact angle	-0.55
4	The touch-down angle	0.59
5	The take-off angle	0.39

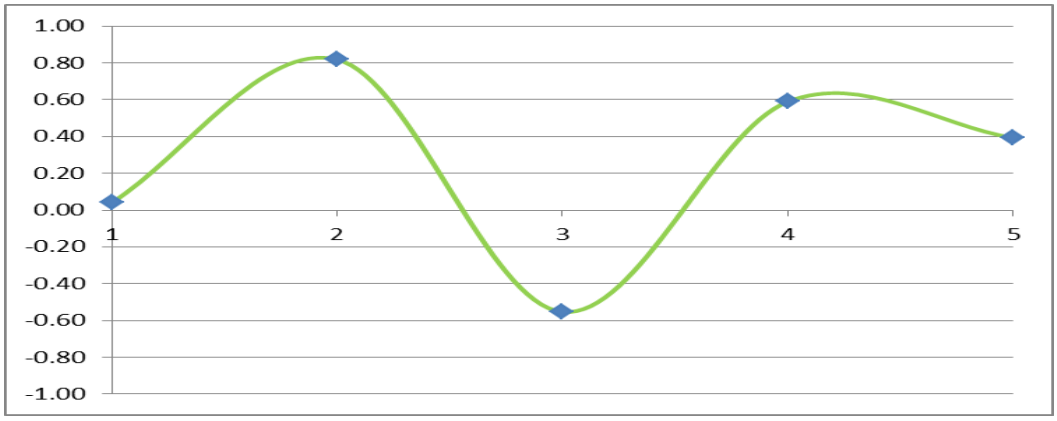

Figure 4. The dynamic of the correlation coefficient (r)

By comparing the values of the correlation coefficient (r), with the ways of its interpretation from the on-line literature (table 3) we can observe that:

- The length of the last running step on the approach presented a correlation coefficient very low, negligible (0.04);
- The height of the body mass center in the touch-down contact presented a very high correlation coefficient (0.82);
- The contact and the touch-down angles presented a high correlation coefficient (-0.55 respective, 0.59);
- The take-off angle presented a moderate correlation coefficient (0.39).

Tabel 3. Interpretation of test value r (M. POPA, f.a.)

Coeficient de corelatie	**Descriptor**
$\leftarrow 0.1$	Very low, negligible, unsubstantial
$0.1 \leftrightarrow 0.3$	Low, minor
$0.3 \leftrightarrow 0.5$	Moderate, medium
$0.5 \leftrightarrow 0.7$	High, major
$0.7 \leftrightarrow 0.9$	Very high
$0.9 \rightarrow$	Almost perfect, describes the relation between two practical indistinct variables.

In conclusion, we can say that, there is a positive correlation between the values of the measured kinematic parameters and the performance obtained in the competition on three from the five indicators respectively, the height of the body mass center in the touch-down contact, the touch-down and the take-off angle. The contact angle presented a negative correlation comparing with the sportive result, and the length of the last running step on the approach indicated a value of the correlation coefficient orientated to a null correlation.

Acknowledgement

This work was supported by CNCSIS – UEFISCDI project number PN II – RU – PD – 167/2010.

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ASSESSMENT OF TACTICAL CHOICES IN WOMEN WATER POLO

RAIOLA GAETANO.[1], DI TORE ANUNZIATA[1], NAPOLITANO SALVATORE[1], IZZO RICARDO[2]

Abstract

In water polo lacks a codified methodology for tactics training, which is thus only left to coach's discretion and expertise by a long time of experience. Nine women water polo matches, during season 2011/2012 Italian female Serie A1), have been analyzed by a water polo coach, helped by a statistician and a performance analyst. Purpose of the analysis process was to identify single events during the matches, to examine the tactical pattern implemented in this events, to obtain by the coach an evaluation on tactical pattern compliance and then to put this compliance in relation to event's outcome. Aim of the work is to verify the efficacy of different attack patterns, when they were well-performed, in order to create a codified methodology for teaching water polo through tactics. The research method is integrated and consists of 3 distinct approaches: case study one of 9 matches of the Italian Serie A1 Women's Championship, season 2011/2012, played by the Volturno sporting club for the analysis of matches, action research one for coach contribution by working and analysis, and theoretical-argumentative one to deduce a framework in which define the data processing.

The research team, composed by coach, statistical analyst, research designer and coordinator, examined matches with Dartfish TeamPro, isolating single key frames or indicators relative to attack events, identifying the implemented attack pattern, then the coach expressed an evaluation on attack pattern compliance.

The results showed a general efficacy of tactical patterns when they are well performed), but showed significant differences within correlation coefficients of single patterns, confirming the need for developing a common methodology for teaching water polo through tactics.

Keywords: action research, case study, performance analysis, evaluation.

Introduction

In water polo lacks a codified methodology for tactics training, which is thus only left to coach's discretion.

This pilot work represents an attempt to develop methods and consequential tools to analyze, and then train, tactical water polo side, knowing that "the coaches of team sports analyze matches and performances of team and opposing teams to get useful data in coaching" Hughes&Franks, 2008) and that, "currently, the process of training, its organization, and teaching methodology need more knowledge on the qualitative aspects of sports performance Wrisberg, Schmidt 2008)".

Nine women water polo matches, during season 2011/2012 Italian female Serie A1), have been analyzed by a water polo coach, helped by a statistician and a performance analyst.

It is vital that the reliability of a data gathering system is demonstrated clearly and in a way that is compatible with the intended analyses of the data.

The data must be tested in the same way and to the same depth in which they will be processed in the subsequent analyses Hughes, 2004; Raiola&Di Tore, 2011). Purpose of the analysis process was to identify single events during the matches, to examine the tactical pattern implemented in this events, to obtain by the coach an evaluation on tactical pattern compliance and then to put this compliance in relation to event's outcome. Aim of the work is to verify the efficacy of different attack patterns, when they were well-performed, in order to create a codified methodology for teaching water polo through tactics. The data, collected via Dartfish TeamPro Software, were analyzed trough a "Waterpolo Tactics Analyzer" software, developed as a web-based application at University of Salerno and released under GNU/GPL license, which returned basic descriptive statistics and the correlation coefficient of each pattern with events outcomes.

The results show a positive and statistically significant correlation $\rho > 0.9$) coefficient between tactical compliance and events outcome, and highlight the need for developing a common methodology for teaching water polo through tactics, confirming once again that "the practical value of performance analysis is that well-chosen performance indicators highlight good and bad techniques or team performances Hughes 2007)".

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Received 15.08.2011 / Accepted 18.10.2011

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

Method

The research method is integrated and consists of 3 distinct approaches: case study one of 9 matches of the Italian Serie A1 Women's Championship, season 2011/2012, played by the Volturno sporting club for the analysis of matches, action research one for coach contribution by training and evaluation, and theoretical-argumentative one to deduce a framework in which define the data processing. The survey of data is entrusted to performance analysis, carried out with the help of a water polo coach, a statistician and a performance analyst.

The tool used for measuring is the Dartfish TeamPro software.

The assessment of compliance for the tactical patterns is entrusted to the coach, on the basis of the video analysis-aided confrontation of attack pattern design against attack pattern effectively implemented during match Raiola et. al. 2011).

The research team examined matches with Dartfish TeamPro, isolating single keyframes relative to attack events, identifying the implemented attack pattern, then the coach expressed an evaluation on attack pattern compliance. Figure 1 illustrates evaluation process.

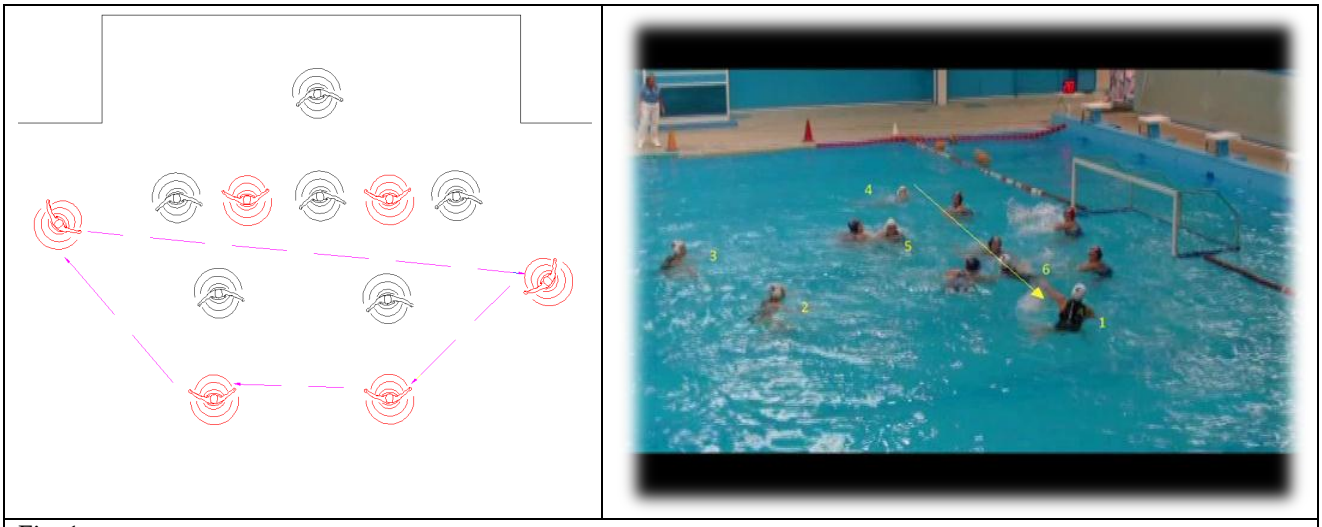

Fig. 1

- confrontation between pattern design and effectively implemented pattern during match for attack pattern named "schema1

A spreadsheet containing, for each row, the match id, the event id, the attack pattern id, the coach's evaluation compliant/non compliant) and the event outcome goal / non goal) was filled.

This data sheet is processed trough the "water polo Tactics analyzer software", which produces basic descriptive statistics and the correlation coefficient of each well-implemented attack pattern with events outcomes. A starting screenshot of "waterpolo tactics analyzer" is shown in figure 2

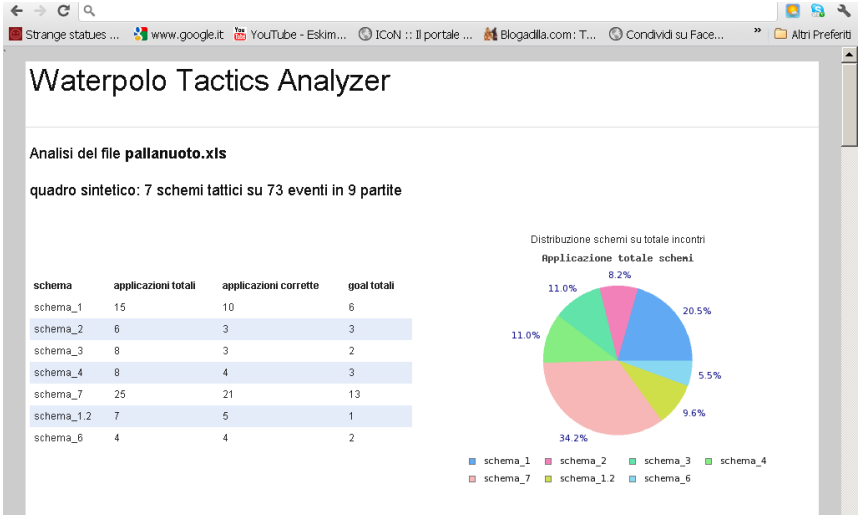

Fig. 2 Waterpolo Tactics Analyzer Output

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In total, 7 attack patterns on 73 events during 9 matches were analyzed. The analyzer software output is discussed by the research team, with consciousness of internal validity, allowed by action research method, of this kind of qualitative analysis.

Results

The performance analysis concerned 7 attack patterns on 73 events during 9 matches.

An evaluation table was constructed by combining, for each single event, the Boolean evaluation of the coach on the compliance of patterns with the event final outcome.

Here are reported:

- 2 confrontations, as an example, of pattern design with Dartfish screenshot of pattern implemented during game, followed by coach's evaluations;
- Basic descriptive statistics occurrence of single patterns on events total, occurrence of "well-performed pattern" on events total, etc…);

The full output of "Waterpolo Tactics Analyzer" is present as an attachment to this article.

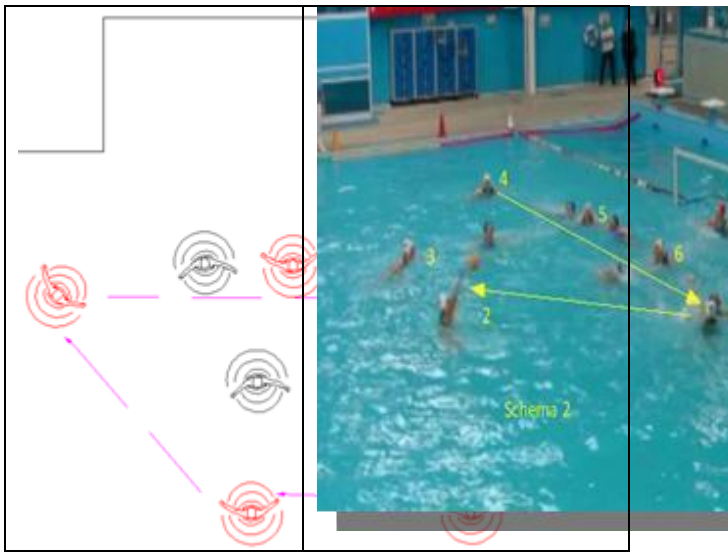

Fig. 3 –c onfrontation between pattern design and effectively implemented pattern during match for attack pattern named "schema2"

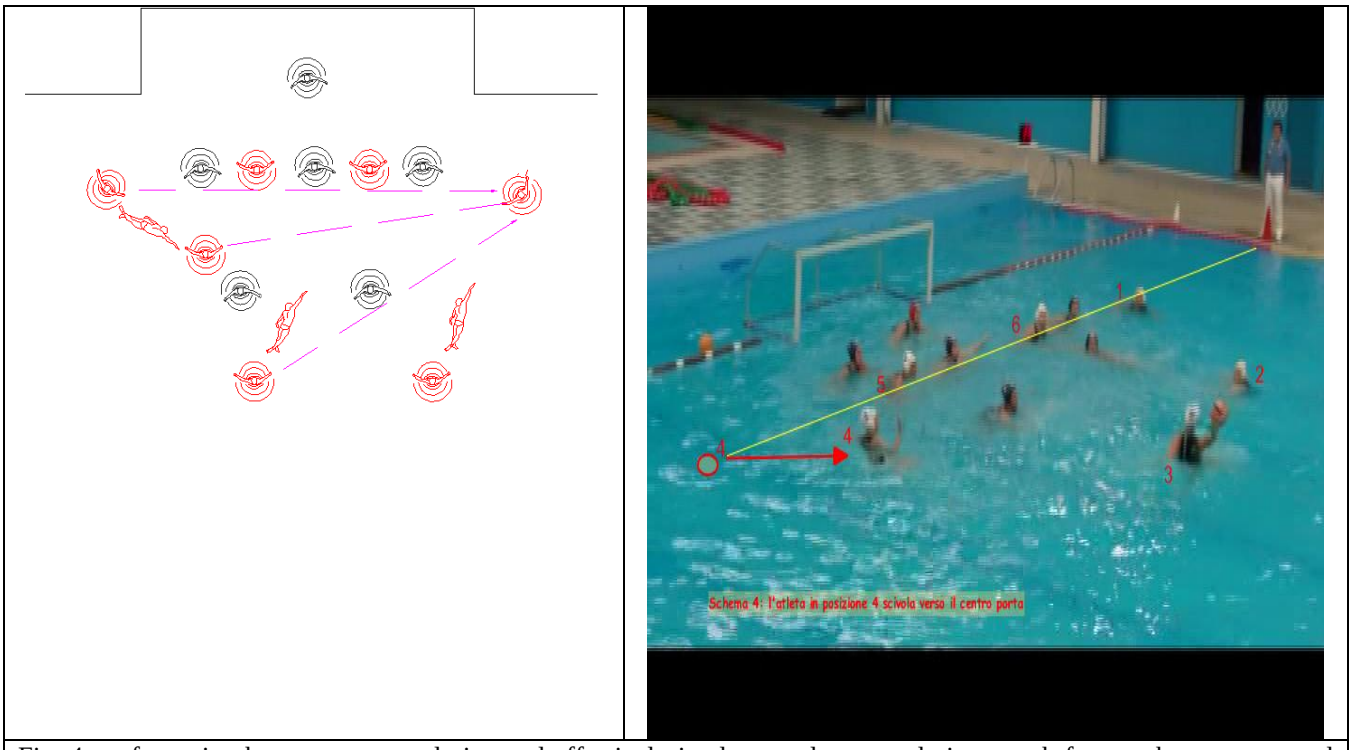

Fig. 4 confrontation between pattern design and effectively implemented pattern during match for attack pattern named "schema4"

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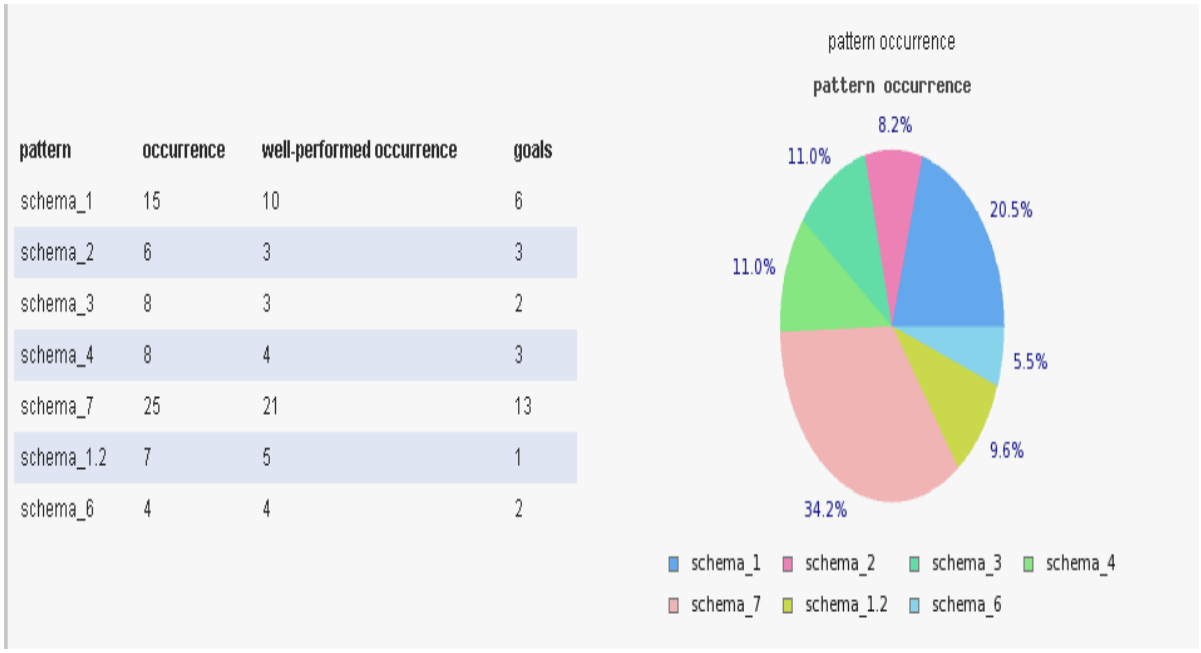

pattern	occurrence	well-performed occurrence	goals
schema_1	15	10	6
schema_2	6	3	3
schema_3	8	3	2
schema_4	8	4	3
schema_7	25	21	13
schema_1.2	7	5	1
schema_6	4	4	2

Fig. 5 pattern occurrence data table and graph

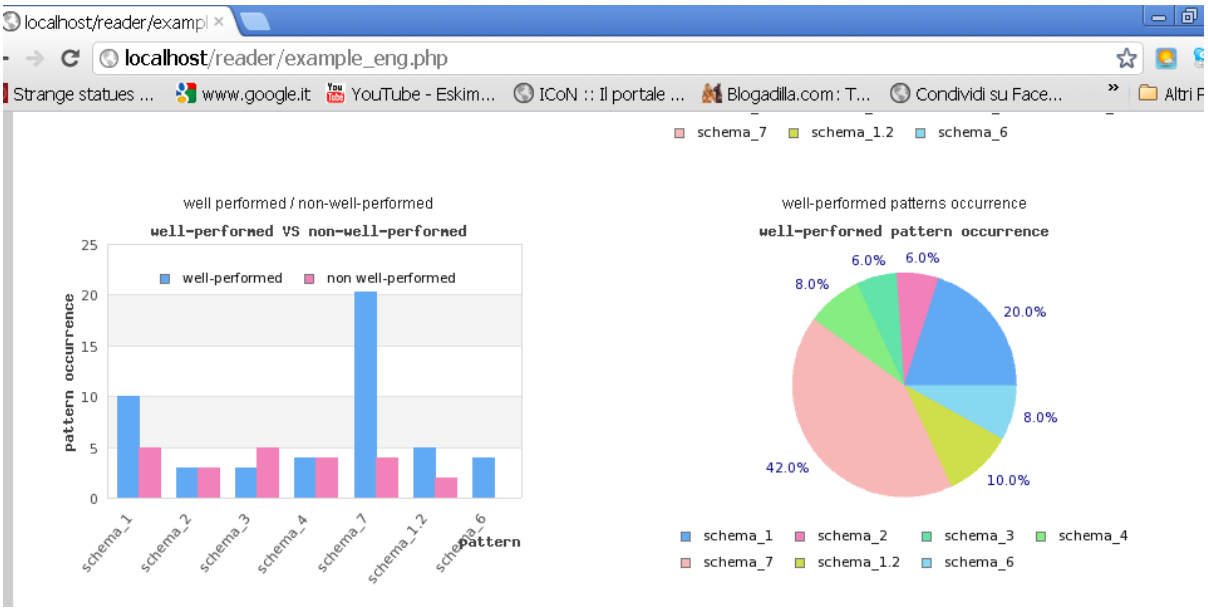

Fig. 6 Confrontation between well-performed and non-well-performed for single pattern and percentage on total events

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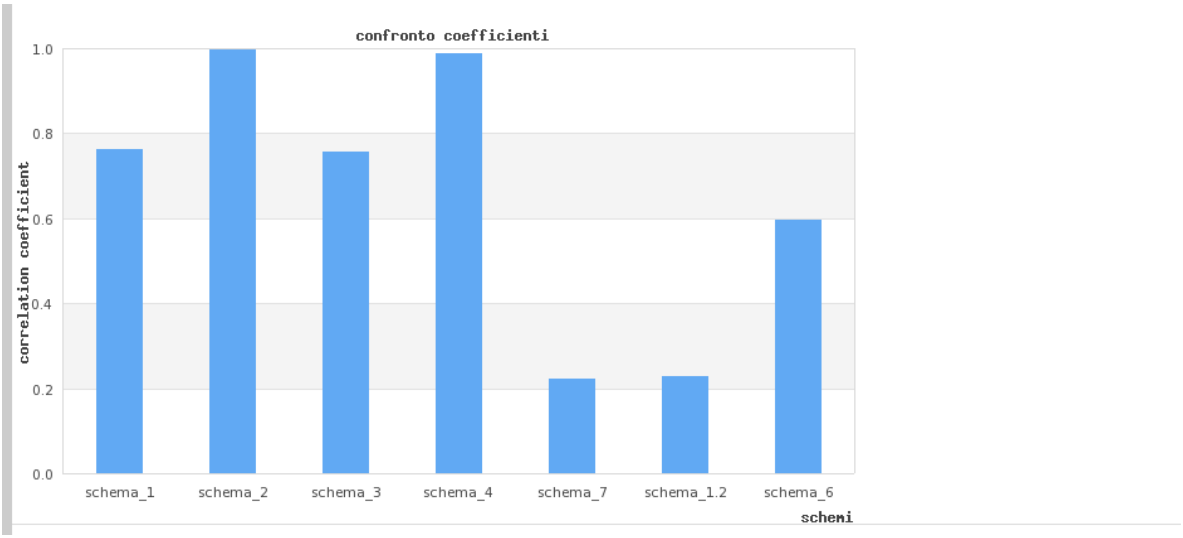

Fig. 7. Confrontation between correlation coefficients of single patterns

The results show a positive and statistically significant correlation ρ> 0.9) coefficient between total occurrence of well-performed patterns and outcomes of events in which tactical patterns are compliant, but the graph in figure 8 shows significant differences between the correlation coefficient of single patterns.

Discussion

The results showed a general efficacy of tactical patterns when they are well performed), but showed significant differences within correlation coefficients of single patterns, knowing that "the correlation coefficient indicates magnitude or amount of a relationship and the direction of relationship" J.R.Morrow& A.Jackson, 2010).

A more consistent data base is needed, in order to establish direct, evident and general relationship between so calculated coefficient and pattern efficacy, and the research team is conscious of internal validity of this kind of qualitative analysis, which can't extend, without adjustments, to other teams.

Although, analysis results represents a tool for the coach, in order to better train team in next season, which were an aim of action research, and showed a general trend on tactical pattern efficacy, which will be deeply investigated in future works.

Furthermore, the results confirm the need for developing a common methodology for teaching water polo through tactics.

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Vol. XII, ISSUE 2 Supplement 2012, Romania
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EVALUATION OF INCIDENCE OF BALL HANDLING ON SWIMMING INTENSITY IN FEMALE WATER POLO

RAIOLA GAETANO[1], DI TORE ANUNZIATA[1], NAPOLITANO SALVATORE[1], TURSI DONETI[1], IZZO RICARDO[2]

Abstract

The purpose of the present study is to verify the incidence of ball handling in swimming intensity in water polo, in order to obtain useful indication in coaching. The research method is integrated and consists of action research for coach contribution by training and evaluation, and theoretical-argumentative to deduce a framework in which define the data processing. Eleven well-trained competitive athletes were recruited and asked to swim 5 x 20-m, one time with ball, and one time without ball. This test was repeated three times.

For each swimmer was calculated the mean and standard error of times per test, both with and without the ball. Analysis was conducted individually for each athlete, and in total for each test. The results, trough confrontation of means of times, reveals a high variability, and indicate a non mechanical incidence of ball handling on swimming intensity. Reading this results in correlation to athletes anamnesis reveals that incidence of ball-handling is significant only in athletes who have a swimming-oriented athletic history, but there are not significant differences in times for athletes who have a water polo oriented athletic history.

The results show as this study can help the coach to train the team for improving the analyzed skills in different mode, creating a methodological system training to enhance the performance.

Coaches are suggested to carefully monitor swimming rhythm during trials, and to increment ball-handling in every training condition.

Keywords: action research, theoretical-argumentative, performance analysis.

Introduction

Water polo is a collective sport and efforts of high intensity are made in less duration, where the players must swim, jump, and send the ball with moments of rest or low intensity; it is also a contact sport where the players conduct battles against their adversaries like blockades, beatings, contacts, and pushes (H.K. Smith, 1998; K. Van der Wende, 2005).

In water polo, the skill that is used for the majority of the game is swimming.

"Water polo consists of high intensity bursts of sprinting, interspersed with short periods of low to moderate intensity swimming." (A. Hohmann, R. Frase, 1992).

In this perspective, swim conditioning is obviously an important aspect of training for Water Polo.

In swimming, conditioning training assumes a consistent role to achieve the better goals (G. Raiola et al, 2011).

Aim of this pilot study was to establish the influence of ball handling in swimming intensity in water polo, in order to obtain useful indication in coaching.

Methods

The research method is integrated and consists of action research for coach contribution by training and evaluation and theoretical-argumentative to deduce a framework in which define the data processing.

Eleven well-trained competitive athletes were recruited and asked to swim 5 x 20-m, one time with ball, and one time without ball. This test was repeated three times.

For each swimmer was calculated the mean and standard error of times per test, both with and without the ball. Analysis was conducted individually for each athlete, and in total for each test.

Results. The following histograms show the mean of times for athlete for the three test.

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Received 15.08.2011 / Accepted 18.10.2011

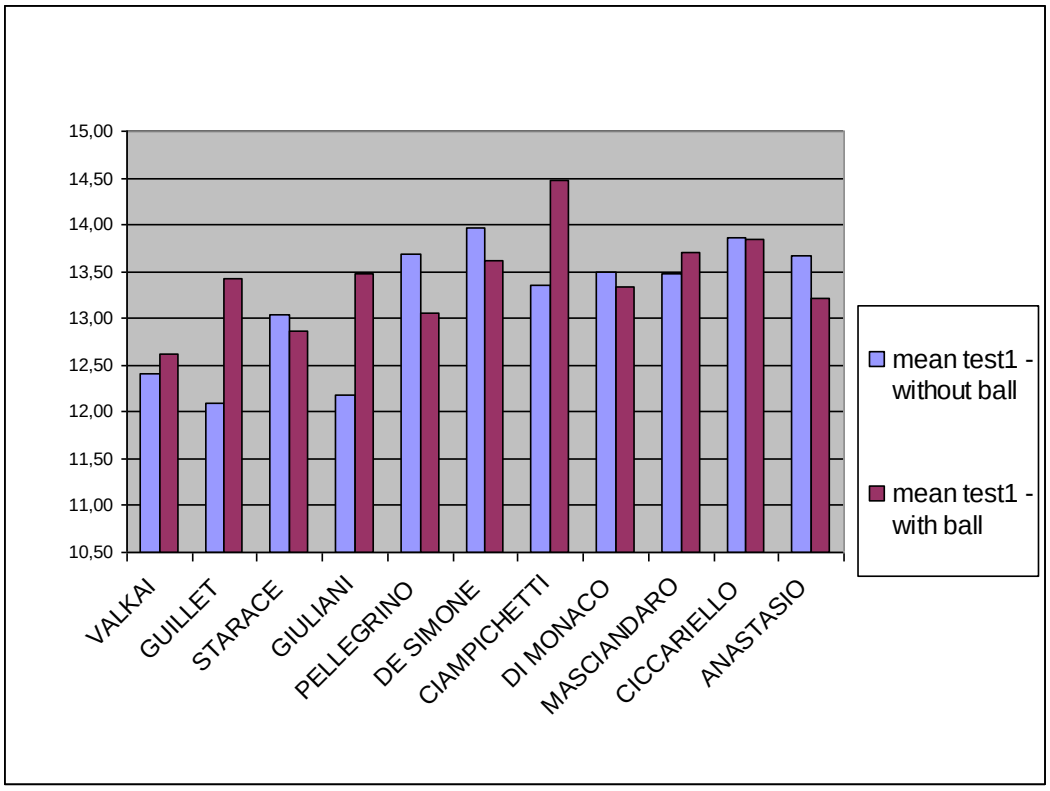

Figura 8 - first test, means with and without ball

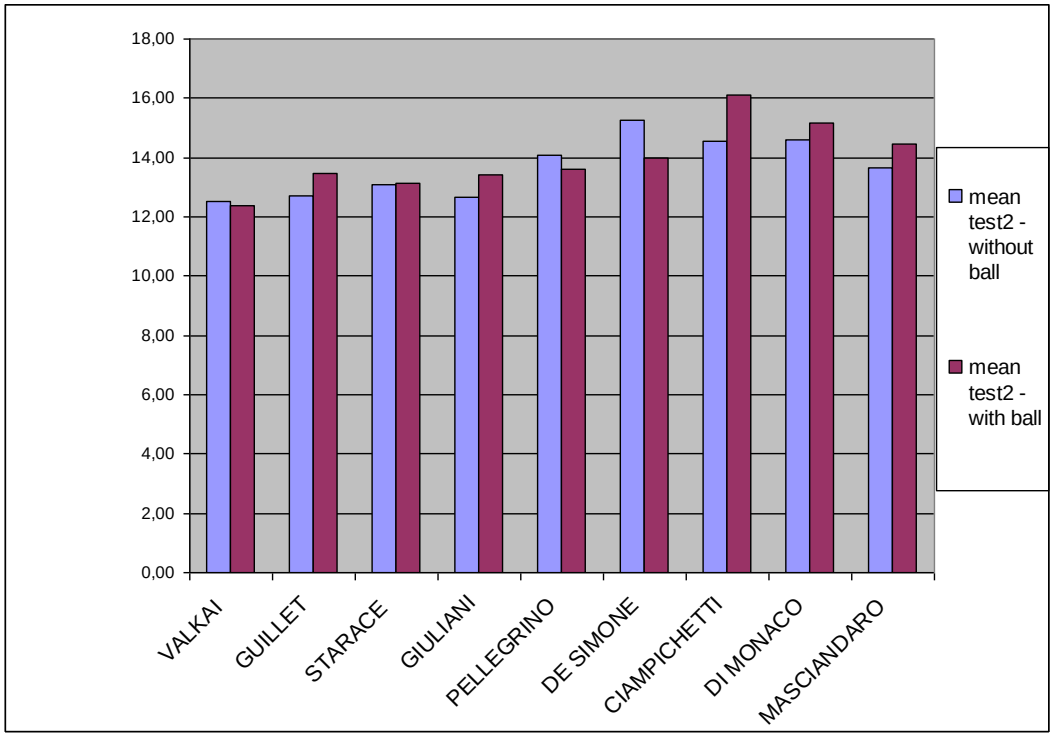

Figura 9 - Second test, means with and without ball

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

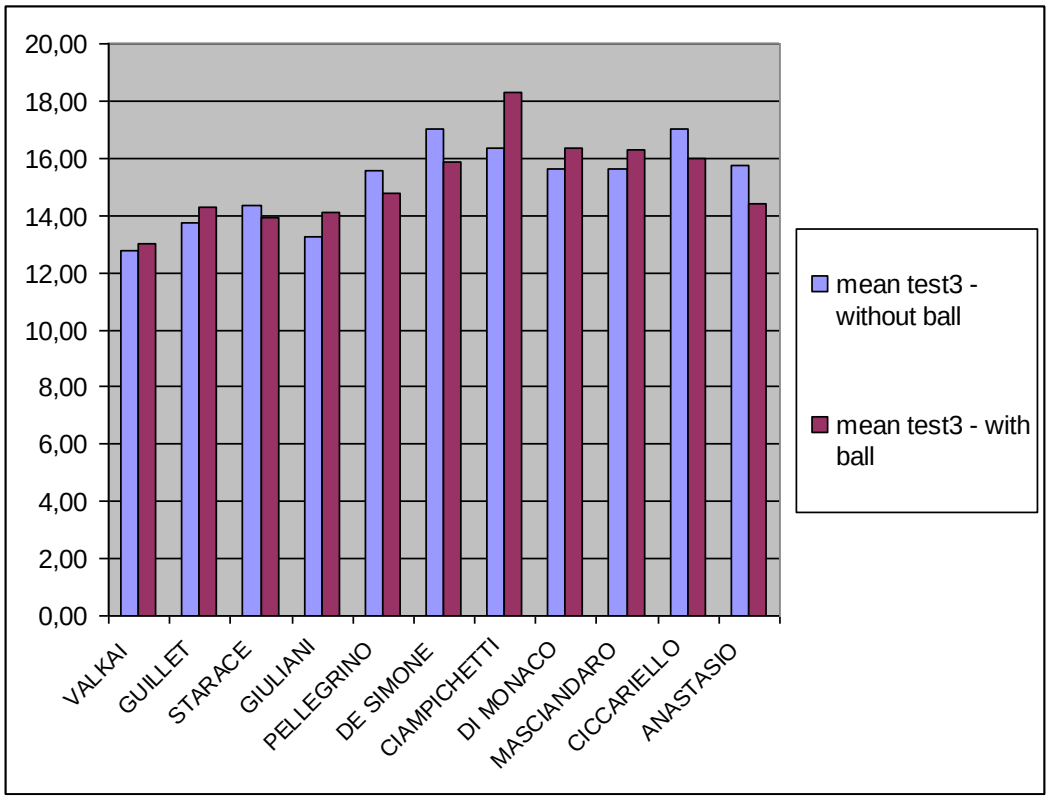

Figura 10 - 3rd test, means with and without ball

Discussion

In table 1 is visible as mean of times without ball is not always smaller than mean of times with ball, which indicates a non mechanical incidence of ball handling on swimming intensity.

This results can be read in correlation to athletes anamnesis, revealing that incidence of ball-handling is significant only in athletes who have a swimming-oriented athletic history, but there are not significant differences in times for athletes who have a waterpolo-oriented athletic history.

Some athletes (indicated with a "<<" in table 1) realized systematically smaller times when they swam with ball.

	1st test without ball	1st test with ball		2nd test without ball	2nd test with ball		3rd test without ball	3rd test with ball	
VALKAI	12,41	12,61	>>	12,54	12,37	<<	12,75	13,03	>>
GUILLET	12,10	13,42	>>	12,72	13,46	>>	13,74	14,28	>>
STARACE	13,04	12,87	<<	13,09	13,15	>>	14,37	13,89	<<
GIULIANI	12,19	13,48	>>	12,64	13,44	>>	13,24	14,11	>>
PELLEGRINO	13,69	13,05	<<	14,07	13,60	<<	15,56	14,78	<<
DE SIMONE	13,96	13,61	<<	15,26	13,97	<<	17,03	15,87	<<
CIAMPICHETTI	13,36	14,47	>>	14,56	16,10	>>	16,37	18,32	>>
DI MONACO	13,49	13,34	<<	14,60	15,15	>>	15,59	16,34	>>
MASCIANDARO	13,48	13,71	>>	13,64	14,44	>>	15,62	16,26	>>
CICCARIELLO	13,86	13,84	<<	14,52	14,43	<<	17,03	15,96	<<
ANASTASIO	13,68	13,22	<<	14,69	13,21	<<	15,73	14,39	<<

Tabella 1 - Means for each test

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 supplement 2012, Romania
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The results show as this study can help the coach to train the team for improving the analyzed skills in different mode, creating a methodological system training to enhance the performance.

Coaches are suggested to carefully monitor swimming rhythm during trials, and to increment ball-handling in every training condition.

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THE RUNNING SPEED DYNAMICS IN JUNIORS III, DURING THE INDOOR 1500 M AND 3000 M EVENTS

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Abstract

Objectives: This study aimed to emphasize the running speed dynamics for the 1500 m and 3000 m indoor endurance events, in 14-15 years old boys and girls.

Material and methods: As research methods we used: the bibliographical study, the test, the statistical-mathematical method, and the graphical representation method. The results were recorded with the Alge Optic 2 electronic timing system. The participants in this research were 32 athletes, 14 and 15 year old boys and girls, runners in the 1500 m and 3000 m events.

Results: The results recorded by the 32 athletes are presented in tables 1, 2, 3, and 4. We found that the running speed and time recorded different values for the analyzed time sequences, during both events. The running speed recorded higher average values for the girls and boys in the 1500 m event, of 5.08 m/s, and 5.59 m/s respectively, in comparison with the 3000 m event, during which they recorded an average of 4.52 m/s (girls) and 5.12 m/s (boys).

The **conclusions** emphasize the fact that the running speed was different from contestant to another, both in the 1500 m, and the 3000 m event, that both events were won by the contestant who managed to run faster and in a constant tempo, and that the athletes did not have the ability to maintain their running speed better during the 1500 m event, than during the 3000 m event.

Keywords: dynamics, speed, movement, running, competition.

Introduction

Training and competition are mentally and physically demanding activities, where the body needs to adapt to effort and stress conditions, developing an ability to endure a prolonged exposure to effort, aiming to achieve high athletic results.

Endurance, as an "ability to perform an effort of a given intensity, within a certain period of time" (P.J.L. Thompson, 1996, page 22) influences the results during sports competitions, especially during those competitions that require a continuous effort.

For the endurance events in most important competitions, we need "an unchanged effort and intensity, and the ability to resist a prolonged effort with a high intensity during a constant period of time" (M. Pradet, 2000, page 77), which is done during training and competitions, starting from childhood, and up to adulthood.

Effort adaptation to the middle distance and long distance events is based on the "energy mechanisms that play a determining role for endurance" (R. Manno, 1996, page 101), mechanisms that improve themselves both during training, and during competitions, and that "require time, and produce an increase in the energy reserves, an improvement in the functionality of the body structures" (G. Neumann, 1994, page 59).

Generally, endurance is increased between 14-15 years old, reaching 85% of the value manifested in adults at the age of 17-18, which leads us to the analysis of the running time and speed during the 1500 m and 3000 m events in juniors III, who are between 14 and 15 years of age.

According to Claparède, 1937, quoted by J. Weineck 1992, "the child is not a miniature adult, his mentality is different from the adult's not only from a

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Received 15.05.2012 / Accepted 18.08.2012

quantitative, but also a qualitative point of view, in that the child is not only smaller, but also different," the child maturing with age.

The competition, as a method of increasing the effort capacity, "allows the studying of individual participation possibilities," and the possibility to assert yourself as an athlete (G. Rață, 2006, page 201), and the effort is done in "conditions of real or apparent balance, in compliance with the demands of that particular activity" (M. Cordum, 2011, page 199).

Ideally, during endurance events of athletic competitions, the runners are able to maintain their effort input "for a long period of time, without a decrease in their performance, in conditions of a good function of the body, of conquering fatigue, and quick rehabilitation" (A. Demeter, 1981, page 98).

Material and method

The ***aim*** of this study was to emphasize the movement speed dynamics for the 1500 m and 3000 m indoor endurance events, in 14-15 years old boys and girls, and also this age group's characteristics. In this study, we tried to verify the following **hypotheses**:

- the running speed was different from contestant to another, both in the 1500 m, and the 3000 m event;
- both events will be won by the contestant who managed to run faster and in a constant tempo;
- the athletes have the ability to maintain their running speed better during the 1500 m event, than during the 3000 m event.

In this study, we used the following ***research methods***: the study of the specialized literature, the observation, the testing method, the statistical-mathematical method, and the graphical representation method.

This observational study comprised 32 ***subjects*** (third category juniors, endurance events runners, 8 female and 8 male for the 1500 m, and 8 females and 8 males for the 3000 m event).

The results were recorded with the Alge Optic 2 electronic timing system, during the Indoor Juniors III Championship, between March 24 and 25, 2012, in Bacau, Romania.

They were centralized, entabulated, and analyzed.

Results

The results for the 1500 m event (for boys and for girls) can be found in tables 1 and 2, while the results for the 3000 m event (for boys and for girls) can be found in tables 3 and 4.

1. Analysis and interpretation of the results for the 1500 m event (for boys and for girls)

In order for us to emphasize the running speed dynamics for the 1500 m event (for boys and for girls), we recorded the time for the first hundred meters, and sequentially, every 200 m, for the rest of the race.

We recorded the time for 8 sequences for eight 14-15 year-old female runners and for eight boys of the same age. The data was collected and can be found in the two tables.

For the girls, as we can see in Table 1, the average value of the final time is of 4'54″93, with extreme values of 4'57″64 and 4'41″08, and the average value for the running speed is of 5.08 m/s, with extreme values of 5.03 m/s and 5.33 m/s. During the first part of the race (100 m), the average running speed for the female runners was of 5.82 m/s.

The average values are as follows: for the 1st sequence, 37.88 seconds, with a running speed of 5.27 m/s; for the 2nd sequence, 38.50 s, with a running speed of 5.19 m/s; for the 3rd sequence, 38.63 s, with a speed of 5.17 m/s; for the 4th sequence, 39.38 s, with a running speed of 5.07 m/s; for the 5th sequence, 40.38 s, with a running speed of 4.95 m/s; for the 6th sequence, 41.38 s, with a running speed of 4.83 m/s; for the 7th sequence, 37.50 s, with a running speed of 5.33 m/s.

The running speed oscillates between average group values of 5.82 m/s and 4.83 m/s during the sequences, and has an average race value of 5.08 m/s.

In first sequence of 100m, and in the last sequence of 200 m, we could observe a higher running speed (5.82 m/s, and 5.33 m/s, respectively) than the average value, of 5.08 m/s, and higher than in the other sequences. In sequences 4, 5, and 6 the running speed value is lower than the average race speed value.

The maximum running speed values are of 6.23 m/s in the first 100 m, and of 5.88 m/s in the 7th sequence, with an average race speed value of 5.33 m/s.

In all of the sequences, the running speed value does not decrease below the average speed value.

The minimum running speed values are of 5.55 m/s in the first 100 m, and of 5.00 m/s in the 7th sequence, with an average race speed value of 5.03 m/s.

With the exception of the first sequence, in all of the others we recorded values below the group average.

As we can see, the average running speed after the first hundred meters slightly decreases throughout the sequences 1, 2, 3, 4, 5, and 6, and slightly increases in the seventh sequence. For the 8 female runners, the running speed is different, the winner being the female contestant who managed to maintain a constant and high tempo.

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

Table 1 - The girls' results for the 1500 m drill

Assessment ind.	Time (S)	100	I	2	3	4	5	6	7
Girls									
Average time (S)	4'54"93	17.18	37.88	38.50	38.63	39.38	40.38	41.38	37.50
A.s. (m/s)	5.08	5.82	5.27	5.19	5.17	5.07	4.95	4.83	5.33
Studev	6.60	0.74	0.99	0.93	1.30	1.19	1.69	1.77	1.85
T. max.	4'57"67	17.99	40	40	41	41	43	44	40
V. min.	5.03	5.55	5.00	5.00	4.88	4.88	4.65	4.54	5.00
T. min.	4"41"08	16.05	37	37	37	37	39	39	34
V. max	5.33	6.23	5.40	5.40	5.40	5.40	5.12	5.12	5.88

For the boys, as we can see in Table 2, the average value of the final time is of 4'28″15, with extreme values of 4'33″69 and 4'23″74, and the average value for the running speed is of 5.59 m/s, with extreme values of 5.48m/s and 5.69m/s. During the first part of the race (100 m), the average running speed for the male runners was of 6.01m/s.

The average values are as follows: for the 1st sequence, 33.50 seconds, with a running speed of 5.97m/s; for the 2nd sequence, 36.13 s, with a running speed of 5.33m/s; for the 3rd sequence, 35.63 s, with a speed of 5.61 m/s; for the 4th sequence, 36.88 s, with a running speed of 5.42m/s; for the 5th sequence, 36.63 s, with a running speed of 5.46m/s; for the 6th sequence, 36.50 s, with a running speed of 5.50m/s; for the 7th sequence, 36.25 s, with a running speed of 5.51m/s.

The running speed oscillates between average group values of 6.01m/s and 5.42 m/s during the sequences, and has an average race value of 5.59m/s.

In first sequence of 100m, and in the 1st sequence of 200 m, we could observe a higher running speed (6.01m/s, and 6.97m/s, respectively) than the average value, of 5.59m/s, and higher than in the other sequences.

In the second, fourth, fifth, sixth, and seventh sequence, the running speed value is lower than the average race speed value.

The maximum running speed values are of 6.39m/s in the first 100 m, and of 6.06m/s in the 1st sequence, and 6.25 s in the 3rd sequence, with an average race speed value of 5.69m/s.

In all of the sequences, the running speed value does not decrease below the group average speed value.

The minimum running speed values are of 5.65m/s in the first 100 m, and of 5.71m/s in the 2nd sequence, with an average race speed value of 5.48m/s.

With the exception of the first sequence, in all of the others we recorded values below the group average.

For the 8 male runners, the running speed is different, the winner being the male contestant who managed to maintain a constant and high tempo.

The results in Table 2 show that the average running speed is oscillating after the first hundred meters, with rising values in the third, fifth, sixth, and seventh sequence, and decreases in comparison with the previous sequence, in sequences 2 and 4.

Table 2 - The boys' results for the 1500 m event

Assessment indicators	Time (S)	100	I	2	3	4	5	6	7
Boys									
Average time (s)	4'28″15	16.65	33.50	36.13	35.63	36.88	36.63	36.50	36.25
Average speed (m/s)	5.59	6.01	5.97	5.53	5.61	5.42	5.46	5.50	5.51
Studev	3.27	0.61	0.76	1.25	1.77	2.17	1.19	1.69	1.91
T. max.	4'33″69	17.69	35	38	37	42	38	39	40
V. min.	5.48	5.65	5.71	5.26	5.40	4.76	5.26	5.13	5.00
T. min.	4'23″74	15.63	33	35	32	35	34	34	34
V. max	5.69	6.39	6.06	5.71	6.25	5.71	5.88	5.88	5.88

2. Analysis and interpretation of the results for the 3000 m event (for boys and for girls)

In order to show the running speed dynamics for the 3000 m event (boys and girls), we recorded the time sequentially, every 200 m, making a total of 15 sequences.

For the female runners, the running speed recorded average values between 5.61 m/s, and 4.39 m/s during the sequences, with an average race speed

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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of 4.72 m/s. In first and in the last sequence of 200 m, we could observe a higher running speed (5.61m/s, and 4.93m/s, respectively) than the average value of 4.72m/s.

In sequences 4, 5, and 6 the running speed value is lower than the average race speed value.

The maximum running speed values are of 5.71m/s, and of 4.76m/s, with an average race speed value of 4.98m/s.

In all of the sequences, the running speed value does not decrease below the group average speed value.

The minimum running speed values are of 5.41m/s, and of 4m/s, with an average race speed value of 4.57m/s.

In all sequences we recorded values below the group average. For the 8 female runners, the running speed is different, the winner being the female contestant who managed to maintain a constant and high tempo.

As we can see in Table 3, the average running speed decreases after the first 200 m sequence, throughout the sequences 2-13, and increases during the sequences 14 and 15.

Table 3 - The girls' results for the 3000 m event

Assessment ind.	Time (S)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Girls																
A. t. (s)	10' 35" 33	35.63	38.00	40.38	41.63	42.38	42.13	42.38	43.63	44.00	44.38	44.88	45.13	45.50	44.63	40.50
A.s. (m/s)	4.72	5.61	5.26	4.95	4.80	4.71	4.74	4.71	4.58	4.54	4.51	4.46	4.43	4.39	4.81	4.93
Studev	22.18	0.92	0.76	2.00	1.92	2.13	1.55	1.69	2.20	2.07	1.92	2.75	2.47	3.34	3.58	3.51
T. max.	10'56"16	37	39	43	44	45	44	45	46	47	47	48	48	50	50	48
V. min.	4.57	5.41	5.13	4.65	4.54	4.44	4.54	4.44	4.34	4.25	4.25	4.16	4.16	4.00	4.00	4.16
T. min.	10'02"09	35	37	38	39	40	40	40	41	41	42	40	42	42	38	37
V. max	4.98	5.71	5.41	5.26	5.13	5.00	5.00	5.00	4.87	4.87	4.76	5.00	4.76	4.76	5.26	5.41

For the boys, as we can see in Table 4, the average value of the final time is of 9'45″64, with extreme values of 9'57″72 and 9'33″73, and the average value for the running speed is of 5.12 m/s, with extreme values of 5.99m/s and 4.89m/s.

In first and in the last sequence of 200 m, we could observe a higher running speed (5.46m/s, and 5.99m/s, respectively) than the average speed, of 5.12m/s, and higher in 6 sequences of the 15.

In sequences 6, 7, 8, 9, 10, 11, 12, 13, and 14 the running speed value is lower than the average race speed value.

The maximum running speed values are of 5.46m/s, and of 6.90 m/s, with an average race speed value of 5.22m/s. In 5 sequences, the running speed value is below the group average speed value.

The minimum running speed values are of 5.32m/s, and of 4.65m/s, with an average race speed value of 5.01m/s. In five sequences we recorded values below the group average.

For the 8 male runners, the running speed is different, the winner being the male contestant who managed to maintain a constant and high tempo.

Table 4 - The boys' results for the 3000 m event

Assessment ind.	Time (S)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Girls																
A. t. (s)	9'45"64	36.64	36.88	37.13	38.25	38.5	40.5	39.63	40.0	40.5	40.5	40.63	40.88	40.63	40.07	33.55
A.s. (m/s)	5.12	5.46	5.42	5.39	5.23	5.19	4.93	5.04	5.00	4.93	4.93	4.92	4.89	4.92	4.99	5.99
Studev	11.28	0.49	0.99	0.99	0.46	0.53	0.53	1.06	1.07	0.76	0.53	1.06	1.64	1.60	2.45	6.71
T. max.	957"72	37.56	39	39	39	39	41	42	41	42	41	42	43	43	43	41
V. min.	5.01	5.32	5.19	5.19	5.19	5.19	4.88	4.76	4.88	4.76	4.88	4.76	4.65	4.65	4.65	4.88
T. min.	9'33"73	36.73	37	38	38	39	40	39	39	40	40	40	40	39	39	29
V. max	5.22	5.46	5.41	5.26	5.26	5.13	5.00	5.13	5.13	5.00	5.00	5.00	5.00	5.13	5.13	6.90

Discussions

After comparing the girls' results from the 1500 m event (an average time of 4'54″93, and an average running speed of 5.08 m/s) with the boys' results (average time of 4'33″69, and an average running speed of 5.59 m/s), we can observe that the boys' values are better then the girls'.

The best time is of 4"41"08 for the girls, and of 4'23″74 for the boys, whereas the average running speed is of 5.33 m/s for the best female runner, and of 6.59 m/s for the best male runner.

We also emphasize the fact that the girls run at certain points during the race with the speed of 6.23 m/s, and the boys, with 6.39 m/s.

In the 1500 m event, the standard deviation for the girls has values between 5.08 and 5.82, and for the boys, the values are between 3.27 and 0.61.

The values show a homogeneity in the groups we analyzed.

After comparing the girls' results from the 3000 m event (an average time of 10'35″33, and an average running speed of 4.72m/s) with the boys' results (average time of 9'45″64, and an average running speed of 5.12m/s), we can observe that the boys' values are better then the girls'.

The best time is of 10"02"09 for the girls, and of 9'33″73 for the boys, whereas the average running speed is of 4.98 m/s for the best female runner, and of 5.22 m/s for the best male runner.

We also emphasize the fact that the girls run at certain points during the race with the speed of 5.71 and 5.41m/s, and the boys, with 6.80 and 5.71m/s.

In the 3000 m event, the standard deviation for the girls has values between 0.76 and 3.51, and for the boys, the values are between 6.71 and 0.49, values that show a low homogeneity in the analyzed groups.

Conclusions

After analyzing the data, we could draw the following conclusions:

1. the hypothesis stating that the running speed was different from contestant to another, both in the 1500 m, and the 3000 m event, was confirmed;
2. the hypothesis stating that both events will be won by the contestant who managed to run faster and in a constant tempo, was confirmed;
3. the hypothesis stating that the athletes had the ability to maintain their running speed better during the 1500 m event, than during the 3000 m event, was not confirmed, the speed recording a decreasing dynamics;
4. the average running speed in the 1500 m event is, for the girls, of 5.08, with a maximum speed of 6.23 m/s, and for the boys, of 5.59 m/s, with a maximum of 6.39. At a first look there are no major differences, but looked in time, they are obvious.
5. in the 1500 m event, the average time recorded by the girls is of 4'54″93, which is less than the boys' average time, of 4'33″69;
6. in the 3000 m event, the girls' average running speed of 4.72 m/s is lower than the boys' average speed of 5.12 m/s.

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VERBAL AND NONVERBAL COMMUNICATION DURING HAMMER THROW TRAINING AND COMPETITIONS

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Abstract

This paper is an observational study conducted between February and March 2012, on 14 Romanian athletes (hammer throwers) and 12 Romanian coaches, regarding the importance and use of the verbal and nonverbal communication during training and competitions. The study tried to confirm two hypotheses. We used as a research method the inquiry, represented by a questionnaire with 6 questions, on which each coach had to choose one answer.

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Received 15.05.2012 / Accepted 18.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

The analyzed answers have emphasized aspects that show the opinion of hammer throw athletes and coaches regarding the verbal and nonverbal communication. Their opinions reveal us that in training, there are small differences in the way in which the communication between the hammer throwers and their coaches is done. The athletes communicate 52.14% nonverbally, through gestures and facial expressions, and 47.86% verbally, while the coaches communicate 50.83% nonverbally, and 49.17% verbally. During *athletic competitions*, the throwers and the coaches communicate more nonverbally, 66.43% and 75.83%, respectively, than verbally, 33.57% and 24.17%, respectively. *Outside their athletic life*, the throwers communicate verbally with their coach more by phone (76.43%) than by written messages (on the Internet, or phone) (23.57%), while the coaches verbally communicate with the athletes orally in proportion of 85.83%, and use written verbal communication in proportion of 14.17%. Fatigue, noise, and weather represent over 50% of the total perturbing factors for the athletes, while the coaches perceive the athlete's tension, nervousness that leads to bad performances, and the athlete's fatigue, as representing over 50% of the total perturbing factors. The communication process is perturbed "most times" by distance and position in proportion of 57.14% for athletes, and in proportion of 58.33% for coaches. The first hypothesis, stating that the hammer throwers use the verbal communication and the nonverbal communication in different proportions during training than during competitions, was confirmed, just as the second hypothesis, stating that the nonverbal communication is used more than the verbal communication by the hammer throwers and their coaches, during training and competitions, was also confirmed.

Keywords: communication, verbal, nonverbal, ratio, training, competition.

Introduction

Athletic training is a process that requires a specific amount of time, and is conceived as a motor-functional system for achieving a certain high performance conduct during a competition (A. Dragnea, 2002). In presenting the concept of "athletic training as an adaptive process," R. Manno (1992, quoted by D.D. Mârza, 2006: 97) writes that: "in the athletic preparation process, the training aims to optimize the necessary adaptations the body needs in order to be able to perform an effort required by the practiced sport", an adaptation that can be known by coaches and athletes through communication. The success of an athletic and professional training is determined by the use of certain subject-centered programs "that support learning, encourage the mental, corporal, and emotional development,..., respect the diversity of people's intelligence, abilities, learning styles, stimulate a reflection on the essential things in life" (I. Neacşu, 2010, page 287), programs that are based on different ways of transmitting the information.

The nonverbal communication, through body language, is specific to physical education and sports, during which every movement is filled with information that can signify different things. That is why the verbal and nonverbal communication represent an important way of knowing and relating for the teacher-student, coach-athlete pair. The concept of communication is quite vast, due to the multiple opinions found in the specialized literature. I. Pânişoară (2003:14-16) presents several theories that are thought to be the most relevant in regards to communication, which is considered as: "a process in which people share information, ideas, and feelings" (*Hybels, Weaver*); "the process in which one party (called emitter) transmits information (a message) to another party (called receiver)" (*Baron*); "the action involving one or more people of sending and receiving messages that can be distorted by noises, takes place within a context, presupposes certain effects, and gives feedback opportunities" (*De Vito*); "a social interaction using a system of symbols and messages" (*George Gerbner*); "a focus of the people's interest on those behavioral situations in which a source sends a message to a receiver with the manifest intention to influence the receiver's subsequent behavior" (*Gerald Miller*); "a set of relations based on transmitting certain stimuli (signs) and evoking answers" (*Colin Cherry*); "an essential process of life through which animals and people generate systems, obtain transformations, and use the information to complete their activities, or carry on with their lives" (*Brent Ruben*).

Identifying the common elements of communication, no matter the field in which it is made (including high performance sports), shows that there is no actual existence without communication. Communication is *"an essential process"*, a *"process with an end"* that is inevitable and continuous (J. Abric, 2002: 15-17), *a transactional process*, it is *information and/or inter and/or intrapersonal relation*, it is a process of *axiological modeling* (V.M. Cojocariu, 2004) that allows knowing the personalities involved in an activity. Human communication, understood as a "complex and dynamic phenomenon that can be defined as the relation through which the people can reciprocally understand and influence through a continuous exchange of diversely encoded information" G. Rață, 2008, page 150), ensures the mental evolution of individuals. The cognition, the emotion, and the conation (the effector) are complex mental processes that overlap in different proportions. Most psychologists are tempted to emphasize the emotional aspects, but for the athletic performance, the cognitive-perceptive or motor-effector aspects are also important (M. Epuran, 2008, page 54). A. Demeter (1982, page 145) writes that during the initiation stage, there is an emphasis on harmonious physical development by using general training means, then towards the end of the training period, there is a gradual change towards a special physical and

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

psychological training, according to each athlete's aptitudes and preferences. "The human bio-psycho-social unit indicates the uniqueness of each person", an unit that determines the training of high performance athletes' personality, and ensures them high level athletic results. Specific to our field (in which educating the motor skills is a priority) is the understanding of the functional relations between the systems and the organs of the body, on one hand, and the voluntary ability of practical or cognitive performance, on the other hand. V. Horghidan, (2000) thinks that intelligence is manifested in the "cognitive organization that expresses itself and functions through finalizations within the motor and communicative behavior plan. It regards equally the selection, caption and treatment of the information received from sources inside and outside the body in order to create the adequate motor responses, but also in the motor expression itself."

Hypotheses

We started this study from the following hypotheses:

- the hammer throwers use the verbal communication and the nonverbal communication in different proportions during training than during competitions;
- the nonverbal communication is used more than the verbal communication by the hammer throwers and their coaches, during training and competitions.

Research methods and techniques

The subjects were 12 coaches and 14 hammer throwers from Romania, who had some experience in professional sports, and who accepted to fill out the questionnaire, anonymously. The questionnaire was handed out in Snagov, Bucharest, and Onesti (during athletic competitions), between February and March 2012. ***The research methods*** we used were: the study of the specialized literature, the inquiry method, the statistical-mathematical method, and the analytical method. As an instrument for assessing the coaches' and the athletes' way of relating to one another verbally and nonverbally, we applied a ***6 item*** questionnaire that was addressed both to the hammer throwers and to their coaches.

Results of the research – analysis and interpretation of the results

The questionnaire-based inquiry that we conducted on the hammer throwers and their coaches allowed us, after analyzing the data, to observe the following aspects.

At question no. 1, *"Considering that both the explanations, and the demonstrations during training are methods of communication, by which way of transmitting the information do you relate to the coach/athlete during training?"*, the subjects had to give points to 3 answer choices we suggested (with a maximum of 10 total points). Because the study comprised 14 hammer throwers, they can have a general total of 140 points, while the coaches can have a total of 120 points.

Table 1 - Points given for the three ways of communicating during training

No.	Way of transmitting the information	Sum of the points		PERCENT	
		Athletes	**C**oaches	**A**thletes	**C**oaches
1.	Nonverbal - body = signs, gestures	44	41	31.43	34.17%
2.	Nonverbal - face = face expression, looks	29	20	20.71.	16.66
3.	Verbal = direct discussions, dialog	67	59	47.86	49.17%;
	Total	140	120	100%	100%

After analyzing the data in Table 1, we can see that the hammer throwers communicate with their coaches: 47.86% verbally, 31.43% nonverbally - using their bodies, and 20.71% nonverbally - using their faces. If we add the values for the two types of nonverbal communication (body and face), we can see that during training the hammer throwers we questioned communicate with their coaches more nonverbally (52.14%) than verbally (47.86%). Regarding the coaches, they communicate with their athletes: 49.17% verbally, 34.17% nonverbally - using their bodies, and 16.66% nonverbally - using their faces. After adding the values for the two types of nonverbal communication (body and face), we can see that during training, the hammer throw coaches use almost in equal proportion the *nonverbal* (50.83%) and the *verbal* (49.17%) communication. As it can be seen, there are no major differences between the athletes' and the coaches' scores, and, as a result, between their percentages, regarding any of the ways of transmitting information.

At question number 2, *"Which ways of transmitting the information do you use to relate to your athlete/coach during competitions?"* the subjects had to give points for 3 answer choices (with a total maximum of 10 points).

Table 2 - Points given for the three ways of communicating during competitions

No.	Way of transmitting the information	Sum of the points		Percent	
		Athletes	**Coaches**	**Athletes**	**Coaches**

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Vol. XII, ISSUE 2 Supplement 2012, Romania
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1.	signs, gestures, = Nonverbal	75	73	53.57	60.83
2.	face expression, looks = Para-verbal	18	18	12.86	15.00
3.	direct discussions, dialog = Verbal	47	29	33.57	24.17
	Total	140	120	100%	100%

After analyzing the data in Table 2, we can see that the hammer throwers communicate with their coaches: 33.57% verbally, 53.57% nonverbally - using their bodies, and 12.86% nonverbally - using their faces. After adding up the values for the two types of nonverbal communication (body and face), we can see that during *competitions*, the hammer throwers we questioned communicate with their coaches more nonverbally (66.43%) than verbally (33.57%). The coaches communicate with their athletes: 24.17% verbally, 60.83% nonverbally - using their bodies, and 15% nonverbally - using their faces. Unlike for training, adding up the values for the two types of nonverbal communication (body and face), shows us that during *competitions*, the coaches communicate with their athletes more nonverbally (75.83%) than verbally (24.17%). In the hammer throw competitions, the distance between the throwers and the coaches is large. According to the regulations, the coach must remain on the sidelines, which leads to a decrease in the verbal communication percentage. This explains why the nonverbal communication percentage is higher. When we compare the athletes' and the coaches' answers, we can observe a small difference in the nonverbal communication's larger percentage during competition (73.83% for the coaches, in comparison with 66.43% for the athletes). The 7.40% difference between the coaches' and the athletes' nonverbal communication shows that during competition, the coaches transmit more information, comprising appreciations, corrections, and encouragements with regards to the athletes' performances.

At question number 3, *"Which ways of transmitting the information do you use to relate to your athlete/coach outside the athletic life?"* the subjects had to give points for 4 answer choices (with a total maximum of 10 points).

After analyzing the data in Table 3, we find that the hammer throwers communicate with their coaches outside their athletic life as follows: oral verbal communication (by telephone) - 50.71%; written verbal communication (telephone messages) - 15%; oral verbal communication (direct conversations) - 25.71%, and written verbal communication (Internet) - 8.57%. Assuming that outside the athletic life the nonverbal communication does not exist anymore, because the two factors involved (coaches and athletes) are not face to face, we have analyzed in comparison the cumulative values for the two forms of verbal communication: oral and written. We found that *outside the athletic life*, the hammer throwers we questioned communicate with the coaches more through oral verbal communication (76.43%) than written verbal communication (23.57%).

Table 3 - Points given for the three ways of communicating outside athletic life

No.	Way of transmitting the information	Sum of the points		Percent	
		Athletes	Coaches	Athletes	Coaches
1.	phone messages	21	67	15.00	10.00
2.	phone conversations	71	12	50.71	58.83
3.	direct discussions, dialog	36	36	25.71	30.00
4	Internet	12	5	8.57	4.17
	Total	140	120	120 p	100%

The hammer throw coaches communicate with their athletes outside their athletic life as follows: oral verbal communication (by telephone) - 58.83%; written verbal communication (telephone messages) - 10%; oral verbal communication (direct conversations) - 30%, and written verbal communication (Internet) - 4.17%. We found that *outside the athletic life*, the coaches we questioned communicate with the athletes much more through oral verbal communication (85.83%) than written verbal communication (14.17%). We can also observe that the Internet is less used to interact with the athletes, a fact that can be explained, based on the observations and discussions we had during training, by a lack of interest (or lack of technical knowledge in working with it) of the coaches for this particular type of written verbal communication. *Outside the athletic life*, the athletes we questioned communicate with the coaches through oral verbal communication in proportion of 76.43%, and the coaches, in proportion of 85.83%; the written verbal communication is used by the athletes in proportion of 23.57%, and by coaches, of 14.17%.

The item number 4, *"Choose 5 of the factors below that have perturbed your communication with the throwers/coach during certain times in your training"*, has the athletes/coaches choose 5 of the factors we suggested that have perturbed their communication at certain points in their training sessions.

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

Table 4 - Options expressed by the hammer throwers and their coaches regarding the perturbing factors

Perturbing factors	No. opt.		Perturbing factors	No. opt.	
	A	*C*		*A*	*C*
weather (wind, rain)	7	5	fatigue	9	5
my attitude (tense, angry)	5	3	the noise in the gym	6	4
the coach's attitude (angry)	3	6	athlete's attitude (misunderstood gestures and demonstrations)	3	6
coach's voice (aggressive tone)	4	2	coach's voice (mild tone)	1	2
the training partners	1	1	my attitude (bad mood)	3	2
Total	21	17	Total	21	19
Total 42 options					

The answer choices are: weather (wind, rain), my attitude (tense, angry), my fatigue, the athlete's fatigue, the noise in the gym, the athlete's attitude (angry), the athlete's lack of focus, the thrower's training partners, other persons who are at that time present during training, my attitude (dominating, rigid), my attitude (sometimes indulgent). The subjects gave the same number of 10 points for the 5 answer choices. The analysis of the 14 hammer throwers' options show the hierarchy of the first 5 factors that have perturbed the communication with the coach during certain parts of the training: fatigue (9 choices); weather (7); noise in the gym (6); the athlete's attitude (tension, anger) (6); the coach's aggressive tone (4). As we can see in Table 4, there were cases in which the "bad mood" of the athletes was admitted by 3 of them, recognizing it as a factor that perturbs the communication with the coach. Also, after adding the first 3 positions in Table 4 (fatigue, noise, and weather), we can see that these represent over 50% of the total perturbing factors. Regarding the options expressed by the 12 coaches, we can see that the first 5 factors (figure 14) perturbing the communications at certain times during training were: the athlete's attitude, represented by tension, anger (6 options); the athlete's attitude, represented by bad performances (6); the athlete's fatigue (5); weather (5); the noise in the gym (4). As we can see, there were cases in which the dominating attitude, or the indulgent one (6 options) admitted by some of the coaches, has represented a factor perturbing the communication with the athlete. Also, when adding the first points - the athlete's attitude, represented by tension, anger, the athlete's attitude, represented by bad performances, and the athlete's fatigue, they represent more than 50% of the total perturbing factors.

The data presented at **item no. 5**, *"Did the position or the distance of the coach/athlete in relation to you created problems for you understanding their demonstrations, the distance existing because he/she wanted to give you indications or corrections regarding the throwing technique?"* had the following values: for "YES, most times" - 4 options, for "YES, sometimes" - 8 options, and for "NO" - 2 options (Table 5). As we can see, most options are for "Yes, sometimes", which leads us to conclude that the positions, or the distances chosen by our subjects to make demonstrations, were not always the best ones. Out of the 14 athletes, 4 (28.58%) think that *position and distance in relation to the coach* has "always" perturbed their communication, 8 (57.14%) have said "most times", and 2 athletes (14.28%) said that their communication was "never" perturbed. The coaches had different opinions regarding *the position and distance in relation to the athlete,* 3 (25%) think that it has "always" perturbed their communication, 7 (58.33%) have said "most times", and 2 athletes (16.64%) said that their communication was "never" perturbed. We can see from Table 5 the difference in points of the coaches' and athletes' options regarding the position and distance between them. In both cases, the distance and position perturbs "most times" the communication process, with percentages of 57.14, for the athletes, and 58.33% for the coaches.

Table 5 - Options expressed by the hammer throwers and their coaches regarding the influence the distance has on communication

Subjects	Always		Most times		Never	
	Options	Percent	Options	Percent	Options	Percent
Athletes	4	28.57	8	57.14	2	14.28
Coaches	3	25.00	7	58.33	2	16.66

Question number 6, *Choose 3 positive and negative characteristics that define the way through which the coach/athlete transmits you information the most during training and competitions* (Table 6), asked the subjects to choose 3 positive and negative characteristics that define the way through which the coach/athlete transmits you information the most during training and competitions.

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Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

Table 6 - The characteristics that define the way through which the coach/athlete transmits you information the most during training and competitions

Positive characteristics			Positive characteristics		
During training	**A**	**C**	**During competitions**	**A**	**C**
▪ calm smile	3	3	▪ calm smile		
▪ dominant posture	1	1	▪ dominant posture	4	5
▪ relaxed, open posture	5	3	▪ relaxed, open posture	-	-
▪ interested face expression	5	1	▪ interested face expression	2	3
▪ moderate visual contact	1	1	▪ moderate visual contact	2	2
▪ permanent visual contact	4	3	▪ permanent visual contact	1	1
▪ the arms support the words	8	8	▪ the arms support the words	6	4
▪ a sufficiently loud and varied tone of voice	2	3	▪ a sufficiently loud and varied tone of voice	6	6
▪ shaky voice	-	-	▪ shaky voice	3	4
▪ evasive, uncaring look	-	-	▪ evasive, uncaring look	-	-
				1	2
Total options	29	23		25	27

Regarding the training (Table 6), of the specific positive nonverbal language characteristics, the 14 athletes chose the following answers: 8 for "the arms support the words", 5 for "relaxed, open posture", 5 for "interested face expression", 4 for "visual contact", and 3 for "calm smile". As the12 coaches are concerned, the options had the following values: 8 for "the arms support the words", 3 for "calm smile", 3 for "relaxed, open posture", 3 for "permanent visual contact", and 3 for "a sufficiently loud and varied tone of voice". For the 14 athletes, the results concerning the transmission of information during competitions were as follows: 6 points for "the arms support the words" and for "permanent visual contact", 4 options for "calm smile", 3 options for "a sufficiently loud and varied tone of voice", and 2 for "relaxed, open posture".

For the12 coaches, the options had values of: 6 points for"the arms support the words", 5 for "calm smile", 4 for "permanent visual contact" and "a sufficiently loud and varied tone of voice", and 3 for "relaxed, open posture".

As it can be seen in Table 6, there are no great divergences of opinions between coaches and athletes regarding the specific nonverbal language characteristics of the coaches and athletes during training and competitions.

Conclusions

The results we have recorded and analyzed have led us to the following conclusions:

1. during *training*, the questioned hammer throwers communicate with their coaches 52.14% nonverbally, through gestures and facial expressions, and 47.86% verbally, while the coaches communicate 50.83% nonverbally, and 49.17% verbally;

2. during *athletic competitions*, the questioned throwers and the coaches communicate more nonverbally, 66.43% and 75.83%, respectively, than verbally, 24.17% and 24.17%, respectively, because of the distance between them;

3. during training and competitions, the athletes communicate more than the coaches, while during competitions, the coaches transmit more information to the athletes, in various proportions, aspects that validate the two hypotheses.

4. *outside their athletic life*, the throwers communicate verbally with their coach more by phone (76.43%) than by written messages (on the Internet, or phone) (23.57%), while the coaches verbally communicate with the athletes orally in proportion of 85.83%, and use written verbal communication in proportion of 14.17%;

5. fatigue, noise, and weather represent over 50% of the total perturbing factors for the athletes, while the coaches perceive the athlete's tension, nervousness that leads to bad performances, and the athlete's fatigue, as representing over 50% of the total perturbing factors;

6. the communication process is perturbed "most times" by the distance and position of the coach and of the athlete, in proportion of 57.14% for athletes, and in proportion of 58.33% for coaches;

7. during training, the positive specific nonverbal language characteristics are, for the athletes: "the arms support the words", "relaxed, open posture" , and"interested face expression", whereas for the coaches: "the arms support the words", "calm smile", and "relaxed, open posture";

8. during competitions, the positive specific nonverbal language characteristics are, for the 14 athletes: "the arms support the words" "permanent visual contact", and "calm smile", whereas for the 12 coaches: "the arms support the words", "calm smile", and "permanent visual contact";

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TECHNICAL PREPARATION OF DEBUTANTES IN IMPROVING WOMEN'S FOOTBALL

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Purpose

Football is primarily a team game, team, which involves direct contact with the opponent, and seeking multilateral athlete, the complexity of movements, as well as its various working conditions. Mastery level corresponds to executions that rely primarily on skills highly automated, with elements of originality, risk, execution giving a high rating. And all this also applies to girls who want to practice football. Therefore and girls must implement the idea that, without proper selection and training in our country, there will be soccer women to live up to internationally competitive.

Methods. The research was conducted during a eight months - between March to October 2011 - and had three distinct phases.

The first step was to study the literature related to our research questions. The stage II, the preliminary experiment was conducted in 2011, the Sports Club CFR Constanta, a total of 30 sports. Based on observations made during this phase, discussions with coaches of other female football team, the analysis based on questionnaire survey and from data processing, we decided to move to the next stage - basic experiment.

In stage Third, the basic experiment, somatosensory function measurements after we crossed the dividing subjects in the control and experimental groups and performed specific technical tests.

At the end of the experiment were processed and plotted statistic data based on their mathematical conclusions and recommendations were made which led to complete research and its practical implementation in this paper.

Conclusions

After applying the pedagogical experiment experimental program and statistical analysis results were found:

1.Implementation of training programs specially designed for newcomers football player led to obtain significantly better in the experimental group compared to control group, the indicators of technical training. Thus, of the 5 samples evaluated, experimental group was significantly better in four of them, namely: keeping the ball, fairway accuracy, shot distance and dribble among landmarks. Evidence that the differences were not significant between the two tests was the driving speed of the ball on line.

2. Control group obtained significantly better results in final testing, from baseline, just to maintain evidence and precision ball kick. At the other three samples, recorded the final testing results were statistically insignificant, compared to the initial testing.

Keywords: training, female soccer, initiation, selection.

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Received 14.05.2012 / Accepted 17.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

Introduction

Currently, women's football is an Olympic sport that has a competitive system very well developed, both the Senior Women and junior level.

Although the game of football does not require much different skills than other sports, "good footballers appear especially where family, circle of knowledge and wider community of which the individual, believe in the usefulness of the opportunity football, showing a cult for this activity "(M. Epuran, E. Horn, 1985).

In countries where women's football has achieved notable successes internationally (Netherlands, France, Germany, Norway, USA) primary selection is done at the age of 6-7 years. The current level of international football player place coordinates of high skill, strength and speed, the trends continue to increase technical virtuosity and psycho-physical basis for harmonious development.

Motivation for choosing the theme

Football is primarily a team game, team, which involves direct contact with the opponent, and seeking multilateral athlete, the complexity of movements, as well as its various working conditions. Mastery level corresponds to executions that rely primarily on skills highly automated, with elements of originality, risk, execution giving a high rating. And all this also applies to girls who want to practice football. Therefore and girls must implement the idea that, without proper selection and training in our country, there will be soccer women to live up to internationally competitive.

Methodological particularities of training in technical training

Objectives:

- Strengthening and improving basic techniques and technical and tactical means of attack and defense subordinated game dynamics;
- Building and strengthening technical skills to carry out the game directly in constant motion.

Tasks:

- Improving and perfecting relaying in all directions, with different trajectories and at different distances from running and jumping;
- Improving and perfecting the goal kick with both feet and head, direct, forceful and placed in different positions and angles;
- Improving and perfecting the ball (with variations of pace and change of direction), fentelor, dribbling and overruns (in terms of specific motility changes and adversity);
- Improving all regulatory processes of dispossession and skills corner closing and locking kick;
- Development of the 2-3-4 combination players (in the same row and different lines) through "one to two sites' cross, interfering with and without completion (after care employment, forwards, backwards, in return).

So good training technique involves continuous modeling exercises used, starting with the free exercise performed with low intensity, continues with the appearance of semi-active and active opponent and ended with executions carried out during crisis time crisis space and adversity. For this purpose systematic technique is a prerequisite for the development of drive systems aimed at improving technical training.

Organization and the experiment

The research was conducted during aa eight months - between March to October 2011 - and had three distinct phases.

The first step consisted in studying the literature related to our research topic.

The second stage, the preliminary experiment was conducted in 2011, the CFR Sports Club in Constanta, on a total of 30 sports. Based on observations made during this stage, discussions with coaches of other female football teams, the analysis based on questionnaire survey and further processing, we decided to move to the next stage - basic experiment.

In etepa Third, the basic experiment, measurements somatosensory function after I switched to dividing subjects in the control group and the experimental group and we made specific technical tests.

At the end of the experiment were processed and plotted statistical and mathematical data and based on their findings and recommendations were made which led to the completion of research and its practical implementation in this paper.

Statistical and mathematical analysis indicators technical training index

Table no.1 Index values recorded at "maintaining" the initial test and final

Parameter tested	Grupa	Lashing ter statistically	Initial testing	Final test	t	p
Keeping skilled foot ball (no maintenance / min)	Experiment	X	20.33	29.50	**12.441**	**< 0.01**
		DS	± 1.23	± 2.19		
		CV	6.05	7.44		
	witness	X	20.12	21.00	**2.497**	**< 0.02**

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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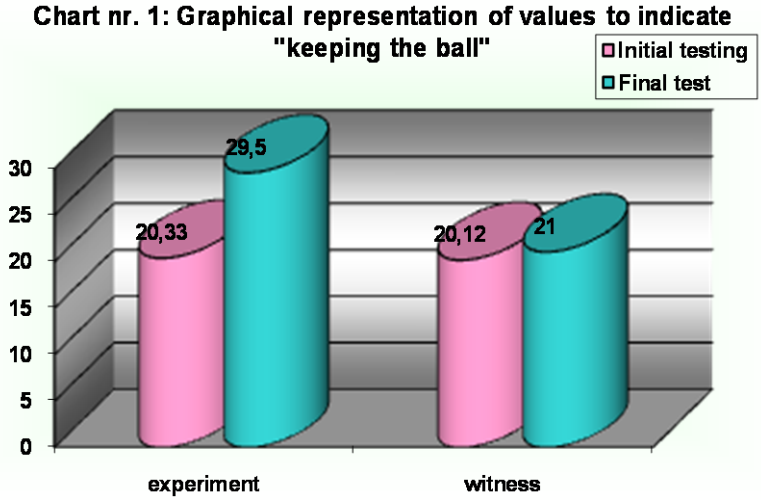
		DS	± 1.35	± 1.69		
		CV	6.73	8.04		
		t	**0.349**	**9.760**		
		p	p>0.05	p<0.01		

Table no. 1 presents the results of the sample averaged maintaining foot ball handy. It is noted that the initial testing, the experimental group showed 20.33 ± 1.23 Keeping values and control group, the values of 20.12 ± 1.35 maintenance. Statistical analysis demonstrated no significant differences between the values recorded by the two groups in this test (t = 0.349, p> 0.05).

Instead, the final test, the experimental group showed 29.50 ± 2.19 Maintaining values, while the control group 21.00 ± 1.69 maintenance. Statistical analysis showed significant differences in favor of the experimental group (t = 9.760, p <0.01).



Statistical analysis of the results of the two tests for each group (Chart no. 1),
showed that the experimental group between initial and final testing, there were significant differences in favor of better final test (t = 12.441, p <0.01). And for the control group between values recorded in the final and initial testing there were significant differences in favor of better final test (t = 2.497, p <0.02). These results and the fact that the final testing experimental group achieved better values than the control, demonstrating that the training methods used in training girls from experimental group are effective.
Analyzing the degree of homogeneity of the groups, we observe a coefficient of variation below 10% which shows that we have two groups with high homogeneity.

Table no. 2: Values recorded at index "fairway accuracy" in the initial and final tests

Parameter tested	Grupa	Lashing ter statistically	Initial testing	Final test	t	p
Accuracy fairway (no. of 10 executions)	Experiment	X	3.50	7.66	**17.289**	**< 0.01**
		DS	± 0.79	± 0.65		
		CV	22.80	8.49		
	witness	X	3.87	5.12	**3.416**	**< 0.02**
		DS	± 0.83	± 0.64		
		CV	21.54	12.50		
		t	**1.001**	**8.634**		
		p	>0.05	<0.01		

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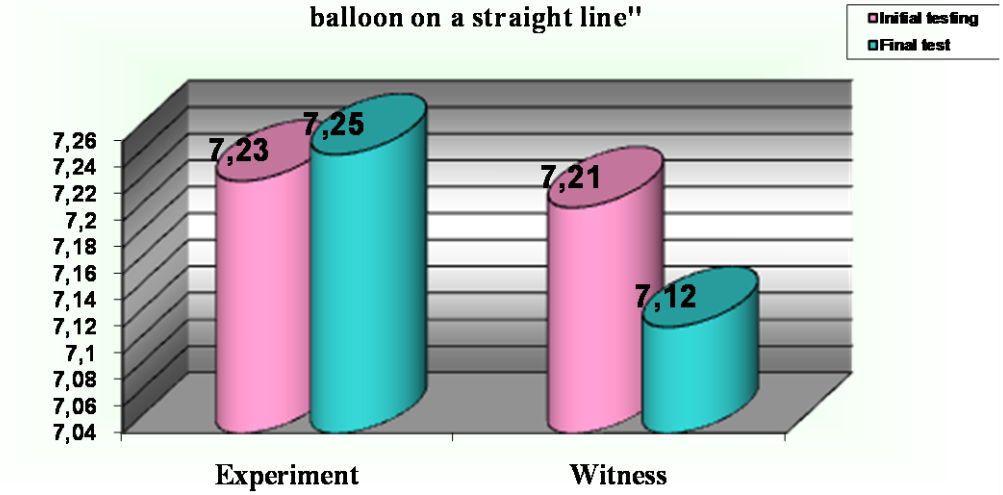
Table no. 2 are the results of the sample averaged precision fairway. At initial testing, the experimental group showed values of 3.50 ± 0.79 precise passes and control group, the values of 3.87 ± 0.83 assists accurate. Statistical analysis demonstrated no significant differences between the values recorded by the two groups in this test (t = 1.001, p> 0.05).

Instead, the final test, the experimental group showed 7.66 ± 8.49 values accurate passes, while the control group 5.12 ± 0.64 assists accurate. Statistical analysis showed significant differences in favor of the experimental group (t = 8.634, p <0.01).

Chart nr. 2: Graphical representation of values in index "lead balloon on a straight line"



Statistical analysis of the results of the two tests for each group (Chart no. 2) showed that the experimental group between initial and final testing, there were significant differences in favor of better final test (t = 17.289 , p <0.01). And for the control group between values recorded in the final and initial testing there were significant differences in favor of better final test (t = 3.416, p <0.02). These results and the fact that the final testing experimental group achieved better values than the control, demonstrating that the training methods used in training girls from experimental group are effective.

Analyzing the degree of homogeneity of the groups, we observe a coefficient of variation between 10 and 30% which shows that we have two groups with relatively high homogeneity.

Table no. 3: Values recorded at index "lead balloon"

Parameter tested	Grupa	Lashing ter statistically	Initial testing	Final test	t	p
Driving the ball at speed on a straight line (s)	Experiment	X	7.23	7.25	**0.518**	**> 0.05**
		DS	± 0.23	± 0.16		
		CV	3.24	2.23		
	witness	X	7.21	7.12	**1.825**	**> 0.05**
		DS	± 0.22	± 0.19		
		CV	3.09	2.68		
		t	**0.192**	**1.522**		
		p	p>0.05	p>0.05		

Proven leadership in ball speed on a straight line (Table 3), the initial testing, the experimental group showed 7.23 ± 0.23 sec values and the control group, the values of 7.21 ± 0.22 sec. Statistical analysis demonstrated no significant differences between the values recorded by the two groups in this test (t = 0.192, p> 0.05).

And final testing showed no significant differences statistically between the two groups (t = 1.522, p> 0.05). The results obtained by the two groups was 7.25 ± 0.16 sec in the experimental group and 7.12 ± 0.19 sec in the control group.

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Statistical analysis of the results of the two tests for each group (Chart no. 3) showed that the experimental group between initial and final testing, no significant differences were best for the final test (t = 0.518, p> 0.05).

And for the control group between values recorded at the final and initial testing there were no significant differences for best final test (t = 1.825, p> 0.05).

This - no statistically significant differences in the sample - can be explained by the fact that the speed is mostly hereditary motor quality, so no chance too large to be improved significantly, but may be due to complexity of proof: the girls had to pargurgă those 20 I track at high speed, and the ball at his feet.

Analyzing the degree of homogeneity of the groups, we observe a coefficient of variability by 10% which shows that we have two groups with very good homogeneity.

Table no. 4: Values recorded at index "shot away" the initial test and final

Parameter tested	Grupa	Lashing ter statistically	Initial testing	Final test	t	p
Shot distance (m)	Experiment	X	15.08	16.16	**3.463**	**< 0.01**
		DS	± 1.42	± 1.32		
		CV	9.46	8.16		
	witness	X	14.83	15.18	**0.885**	**> 0.05**
		DS	± 1.08	± 0.88		
		CV	7.28	5.82		
		t	**0.436**	**1.986**		
		p	p>0.05	p>0.05		

Table no. 4 the results averaged to sample distance shot. At initial testing, the experimental group showed 15.08 ± 1.42 m values and control group, the values of 14.83 ± 1.08 m Statistical analysis demonstrated no significant differences between the values recorded by the two groups in this test (t = 0.436, p> 0.05).

And final testing showed no significant differences statistically between the two groups (t = 1.986, p> 0.05). The results obtained by the two groups being de16.16 ± 1.32 m from the experimental group and 15.18 ± 0.88 m the control group.

Table no. 5: Values recorded at index "dribbling through cones" in the initial and final tests

Parameter tested	Grupa	Lashing ter statistically	Initial testing	Final test	t	p
Dribbling through cones (sec)	Experiment	X	12.30	12.17	**2.602**	**< 0.05**
		DS	± 0.24	± 0.38		
		CV	2.00	3.13		
	witness	X	12.10	11.90	**1.239**	**> 0.05**
		DS	± 0.29	± 0.43		
		CV	2.42	3.64		
		t	**1.654**	**1.455**		
		p	p>0.05	p>0.05		

Evidence to dribble through cones (Table no. 5) the following results were obtained: initial testing, the experimental group showed 12.30 ± 0.24 sec values and control group, the values of 12.10 ± 0.29 sec. Statistical analysis demonstrated no significant differences between the values recorded by the two groups in this test (t = 1.654, p> 0.05).

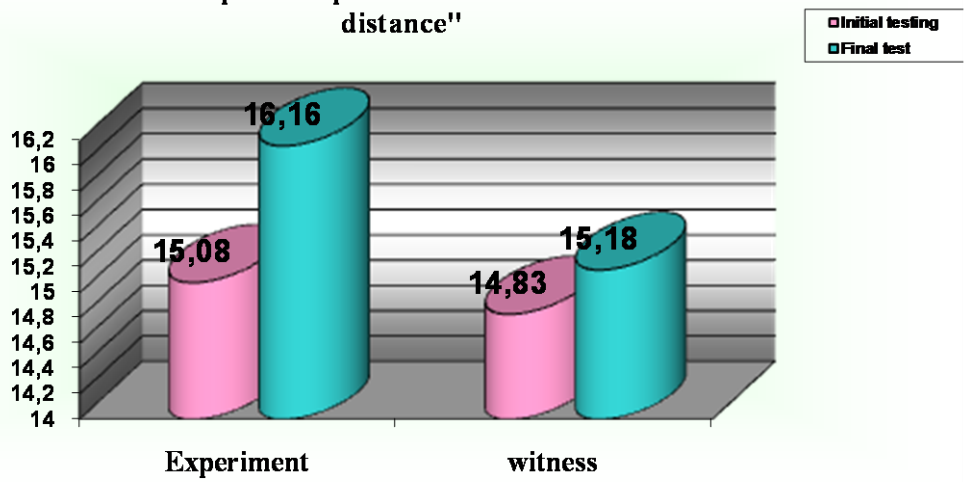
And final testing showed no significant differences statistically between the two groups (t = 1.455, p> 0.05). The results obtained by the two groups being de12.17 ± 0.38 sec in the experimental group and 11.90 ± 0.43 sec for the control group.

Comparing results from the two tests for each group (Chart no. 3) it is observed that the experimental

group between initial and final testing, there were significant differences in favor of better final test ($t = 2.602$, $p < 0.05$). In contrast, the control group between values recorded at the final and initial testing were not significantly different ($t = 1.239$, $p > 0.05$). The fact that the final testing experimental group achieved better values than the control, in this case demonstrates that the training methods used (Coerver method) girls training in the experimental group are effective.

Analyzing the degree of homogeneity of the groups, we observe a coefficient of variation of up to 10% which shows that we have two groups with high homogeneity.

Chart nr. 3: Graphical representation of values in index "shot distance"



In general motility tests performed comparative analysis between initial and final testing has shown significant progress in the experimental group at 4 of the 5 samples: keeping the ball, fairway accuracy, shot distance and drbling among landmarks. Evidence that the differences were not significant between the two tests was the driving of the ball at speed on a straight line.

Control group achieved significantly better results in final testing, from baseline only in samples keeping the ball and kick accuracy. At the other three tests, final test results were recorded insignificant compared to those of the initial testing.

In this case, use of modern training (Coerver method) in which the emphasis is on working on individual technique and ball work resulted in obtaining favorable results in the experimental group.

Conclusions

After applying the pedagogical experiment experimental program and statistical analysis of the results were found as follows:

1. Implementation of training programs specially designed for beginner fotbalistele led to obtain significantly better in the experimental group compared to the control group, the indicators of technical training. Thus, the 5 samples evaluated, the experimental group was significantly better in four of them, namely: keeping the ball, fairway accuracy, shot distance and drbling among landmarks. Evidence that the differences were not significant between the two tests was the driving of the ball at speed on a straight line.

2. Control group achieved significantly better results in final testing, from baseline only in samples keeping the ball and kick accuracy. At the other three tests, final test results were recorded insignificant compared to those of the initial testing.

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

COACHING FOR PERFORMANCE IN ATHLETES TEAMS

TEODORESCU SILVIA[1], URZEALĂ CONSTANTA[1]

Abstract
Purpose. Our purpose is to bring into the specialists' attention the concept of coaching for sports performance.
Methods. This paper is an essay about the main meanings of coaching.
Content. The coach possessing real managerial aptitudes can render efficient his athletes' training and can lead to their maximum potential.
Conclusions. Coaching is an attitude and a behavior, with applications in the training process.
Keywords: coaching, sports, performance.

Introduction

Coaching for performance represents a modality of getting maximum results in the objective-based competitions, through fundamental changes in athletes' attitude and behavior determined by their permanent responsibilisation and awareness of all the actions. Its purpose is to increase the result qualitative level and the learning capacity by the feed-back providing, but also by other techniques, such as motivation and the management style efficient adaptation, depending on both the athletes' training level and the objective to accomplish **(**J. Lyle, 2002).

In our previous studies, we emphasized that the concept of "coaching" is taken from the managerial tools successfully used to reach performance, these ones comprising the goal accurate formulation and the development of human resource's aptitudes, as a consequence of the feed-back providing, of motivation and of the questioning efficient utilization.

In this paper, we mainly aim at identifying the most appropriate questions through which the coach can explore the athlete's maximum potential, by helping thus his team to achieve the best results in competitions.

Content

Sports performance requires the coach to focus on goals and expectations, on the situations that might occur in training and competition, but also on actions and learning, by starting from the reality and being guided to a precise destination – *the final objective*.

Coaching includes the following aspects:

- ***Rational analysis***

Sports coaching is mainly concerned with the valorization of an athlete's or a team's performance capacity, in relation to the general potential and the specific performances. The coach is thus supposed to be aware of all the aspects conditioning the performance in all its development stages, starting from objectives, prediction, monitoring, the training program scheduling, the strategic and tactical planning (A. Dragnea, S. Teodorescu-Mate, 2002).

The alternative of increasing the awareness degree through coaching covers and emphasizes the unique attributes of each individual's body and mind, by consolidating, at the same time, his capacity and self-confidence, as well as his self-responsibility. Coaching shouldn't be confused with the prescription "*here are the tools, go to discover by your own!*"

Awareness, generally speaking, means to know what happens around you, while self-awareness means to know what you experiment (T. Gallwey, 1974).
Under these conditions, we can assert that any human activity may be reduced to *input – process – output.*

No matter how good a person can be in processing the received input and to what extent the reactions might be, the output quality will depend on the input quality and quantity. The awareness increasing degree is due to the acuity of the input receptors, which often harmonize the senses, but also involves the brain. Coaching stresses the high quality relevant input that supposes the existence of a self-generated input, respectively the involvement into the situation.

Awareness also supposes a *feedback* provided by the environment, the body, the facilities, the actions, which is opposed to the feedback provided by other persons (D. Hemery, 1991).

The performance capacity valorization actually presumes to reach an objective focused on the individual's and the process quality, but also on stability, which don't result merely from chance or maturation. From this point of view, the sports shape stability and the training specificity reduce the performance unpredictable character.

- ***Settling the team's unique objective to which the team gets closer and that can be reached only by the whole team's effort***

The objectives based only on the current reality and formulated like answers to a performance problem comming from the past, may not mobilize the athletes' resources (J. Whitmore, 2008), remaining rigid goals and being realised with an inferior efficiency than expected. This way its can become contra-productives and estrange the athletes from the long term targets.

Given this context, settling the objectives means to require the skilled coach to make an intellectual, practical and experimental exercise. Objectives are integrative elements that create a connection between the athletes' intention and potential, aspirations,

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Received 12.05.2012 / Accepted 13.08.2012

resources, environmental and organizational conditions, and the operationalized process in its whole. When accepting the proposed objectives, the athlete gets engaged into the training and competition processes. Objectives determine both the training and performances the planning exercise relies on.

There are final (performance) objectives and instruction objectives described in the terms of the performance capacity components. Objectives may also refer to the training process components (adhesion to training, interest, responsibility etc.).

It is imperative to harmonize the personal and team's objectives: the discrepancy between them leads to failure.

In this situation, the team exploration and identification will result in the awareness of the common goal and the creation of group productive relations. In fact, the identification of each athlete's responsibilities in achieving the team's objectives can be a difficult path to follow. Usually, a team doesn't have either a core – made up of its most responsible and skilled members – exclusively focused on the objective fulfillment or an external "layer" distributed on a wider area of responsibilities.

If the athletes declare to be members of a team but they work individually, we clearly have to deal with a dysfunctional team. However, it is a team! Namely, there is a common goal, a shared responsibility in completing it and concrete actions in this sense. This methodology, this performance management system remains, in this case too, a relevant and potential successful tool.

Why a methodology? Because Romanian sports frequently lack a systematical application of a process meant to change the team behavior.

A first step is represented by the identification of some objectives greatly related to the whole team behavior, by the careful analysis of the athletes' opinions and actions concerning the objectives directly correlated to the team behaviors.

In this sense, the coach must pay attention to aspects such as:

Knowing the behaviors that can certainly determine the team's success

For this, the team behaviors on the current moment should be assessed by the same measurement method used at the first step. Thus, we can make comparisons between the existing situation and the expected one, by identifying the strengths and weaknesses that leave their mark on the team's successful behavior.

The expertise operation depends on coach's knowledge and (mental and motor) skills, which represent his personal values. The system (matrix) of cognitive and specialized skills will be performed in the context of communication, management, leadership and quick decision-making (if needed) or of the deep reflection.

Coaching is nonsense if there are no athletes or a team. The value given by the manifest capacities determines the goal settling, the performance achievement and the structuring of the whole process developed in the training-recovery block. This process is difficult to carry out and it requires us to take into account the interactions among the genetic block, the environmental influences, the learning process, technology and the factors determining the results. While the hereditary factors can establish the performance limits, the coaching process quality determines how close to these limits the athlete can go.

Finding out the immediately discernible differences between present and future, and the possibilities to eliminate them

To this purpose, the coach should conceive a development program or a series of practical actions able to delimit the improvement areas and to induce the behavioral change.

The coaching process will firstly include the athletes, the coach, the form, nature and dimension of the relation between them, the intervention program, sports performance and the context. Each one of these elements is interdependent and has numerous sub-elements.

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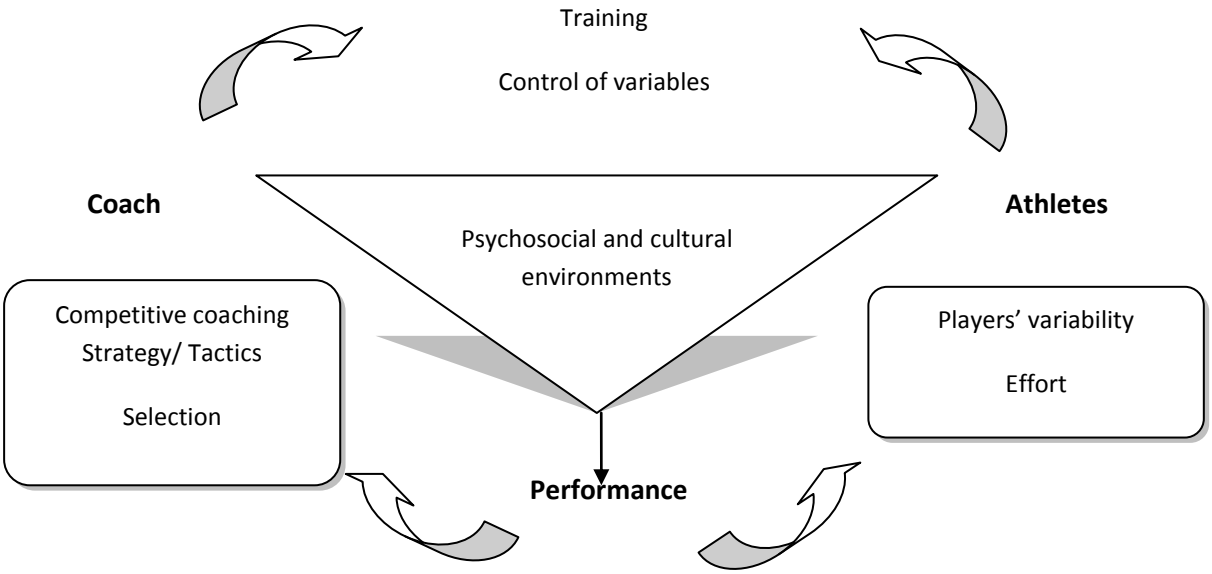

Figure 1. *Complexity of the coach-athlete-performance interaction*

Identifying the most appropriate process for the team behavioral change, by having in view its development stage and the specificity of its objectives

Concerning the activity organizing in order to complete the final objective, the coach should find the best modality to formulate the questions that will be addressed to his athletes during the precompetitive stage. Thus, the following sets of questions can be considered as useful tools in the coaching process:

Questions for the identification of each athlete's place and role within the team, according to the tactical conception:

- What are you going to do? - it implies a firmer decision, as compared to questions such as: *what could you do?, what are you thinking of doing?, which of these alternatives do you prefer?*, if the tactical (action) plan will include more than
one of the options or partial options combined among them.

- When are you going to do it? - it establishes, with an extreme accuracy, the time frame and, why not, the situation to be solved.

- Will this action meet your goal? - it determines the athlete to think about each tactical action and its effects, depending on the opponent's strategy, but also on the goal.

- What obstacles might you encounter on your way? - it determines the athlete to take into account all the possible tactical variants that could be adopted by his opponent.

- What other considerations do you have? - it compels the athlete to seriously analyze his future and delimit the weaknesses and strengths that might occur during the competition.

- Can you rate on a scale from 1 to 10 your degree of certainty that you will complete the agreed actions? - it refers to the athlete's self-confidence that he will fulfill his task, confidence generally resulted from his high training level.

- What prevents it from being a 10? - it makes the athlete become aware of the causes (engendered by the opponent, referees, environment) that may hinder him to win the contest.

In order to synthesize the above-mentioned aspects, we present a coaching technique with immediate results, conceived by M. Landsberg (2005):

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Thus, it can be considered that responsibility awareness are, with no doubt, two crucial qualities

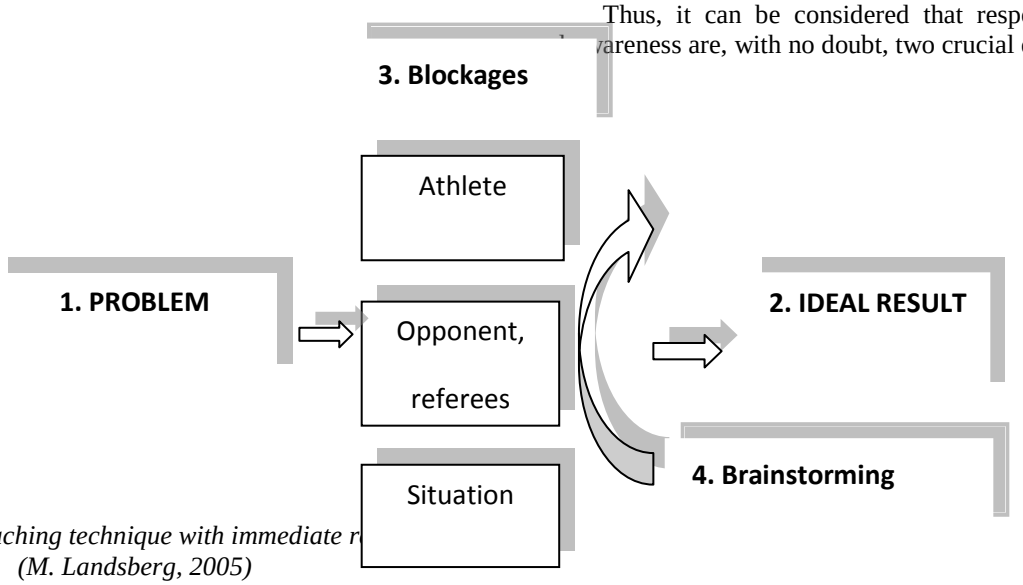

Figure 2. *Coaching technique with immediate r*
(M. Landsberg, 2005)

The specialty literature emphasizes that those who evaluate themselves by less than an 8 score on the scale will seldom succeed in fulfilling their tasks. However, when they are confronted to the necessity of admitting their failure, some athletes could suddenly find their motivation.

Questions for the identification of possibilities to mobilize one's internal resources:
- What do you feel when the competition starts?
- What emotions do you bear in mind about your latest defeat?
- What do you think you are afraid of?
- Where in your body do you feel tension?
- In what way do you inhibit your potential?
- What is your predominant feeling when you know you have done a good job?
- Can you give me a rating, on a scale from 1 to 10, for your level of confidence in your capacity to be successful in the contest? (J. Whitmore, 2008).

The inner awareness increases the corporal efficiency and, together with the athlete's feelings and attitudes, colors his perceptions and relations with the others. Most of the thoughts are impregnated with a specific emotion; all the emotions are reflected in the body; corporal sensations generate other thoughts. That is why worries, blockages and inhibitions can be approached through the mind, the body or the feelings, and the clarification of one of them tends to free the others, even if this doesn't always happen.

Responsibility, as another dimension of coaching, is indispensable to the performance obtaining. In case of a really acceptance of the choises or the taken responsibility for thoughts and actions, engagement to those increases and so does the performance. Becoming truly responsible involves invariably to make a choice.

for the performance in any activity and, implicitly, in sports.

Under these conditions, we can assert that the coaching role is to consolidate and preserve the athlete's self-confidence. In sports, where both success and failure are clearly defined situations, where rules are simple, the time intervals between competitions are short and the physical and/or mental demands are well determined, the intrinsic motivation obviously intervenes, although many publications (tabloids) try to make us believe that celebrity and wealth are each performer's dream. We don't exclude that this works with certain athletes, but most of them aim at reaching less tangible goals, such as identity and self-esteem, excellence and top experience, purely personal rewards.

- ***Operationalization***

The transfer from conception to practical application involves the active behavior of the coach (intentions, planning, training, competition), of the athletes and of the other concerned factors. The transposition, through practical operations, of what is thought and projected to the training and competition concrete situations (creating the conditions, the context) and even to the individualized training completes the coaching process.

Operationalization has three functions:

a) *practice management* (planning and directing the training lessons – units – under different preparation forms);

b) *sports competition management* (training, selection, leadership);

c) *program management* (organization, administration, financing, contacts, participations, professional meetings etc.).

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The balance among these functions is greatly influenced by the value, availability and contribution of the specialist team members.

The whole program effect depends on the context in which it is carried out (international legislation, national legislation – federation – owner, competition calendar, general social framework etc.).

The performance improvement should be ***stable, predictable and manageriable*** (possible to be achieved under the real conditions in which the process takes place).

Progresses are determined by the training scientific base, which takes into account all the parameters and the achievement principles. *Progresses shouldn't result from chance or some happenings.* They rely on the possibility to control the variables and make decisions, therefore on data, evidence, principles and methods.

Throughout the whole process, the coach should systematically apply the psychological training, particularly concentration-relaxation exercises, intellectual training, motivation, will, affective balance and, in a word, the competitive spirit permanent development. Responsibility and optimism should characterize both training and competitions.

- ***Individualization***

This activity depends on the sports group size, on player's needs, on the specificity of his position, on events etc.

In this sense, we should take into consideration that:

- the coaching process is unique and original;
- the coach must approach training in a particular way;
- the specificity of sports branches influences the training individualization method.

- ***Adjustment***

The coaching process nature involves a permanent adjustment, because the environment is continually changing, the training bounds are obvious and, consequently, the work tasks should be constantly adapted.

Adjustment is continuous, for the harmonization (optimization) of planning with the work tasks, with the practical reality, its perspectives and circumstances.

A coaching session model is thus made up of four important steps: in the first stage, the coach and the athlete settle, by common agreement, an objective; in the second stage, the participants use self-assessment and concrete examples, to illustrate the situation; the third step includes the options, so the participants make suggestions and choices; finally, conclusions are formulated, then the coach and the athlete take action, by establishing the time frames for the objectives and by identifying how to overcome the possible obstacles.

In order to apply this model (called *OROC*), M. Landsberg (2005) proposes:

- to use the greatest possible number of questions instead of suggestions, by stimulating the athlete to find useful ideas by himself;
- to combine creative and systemic thinking, especially in the option and the conclusion drawing stages;
- to exemplify and check the athlete's understanding in each stage, by using concrete examples from his own experience or from the athlete's life;
- to extend or to shorten the coaching meetings, depending on the situation.

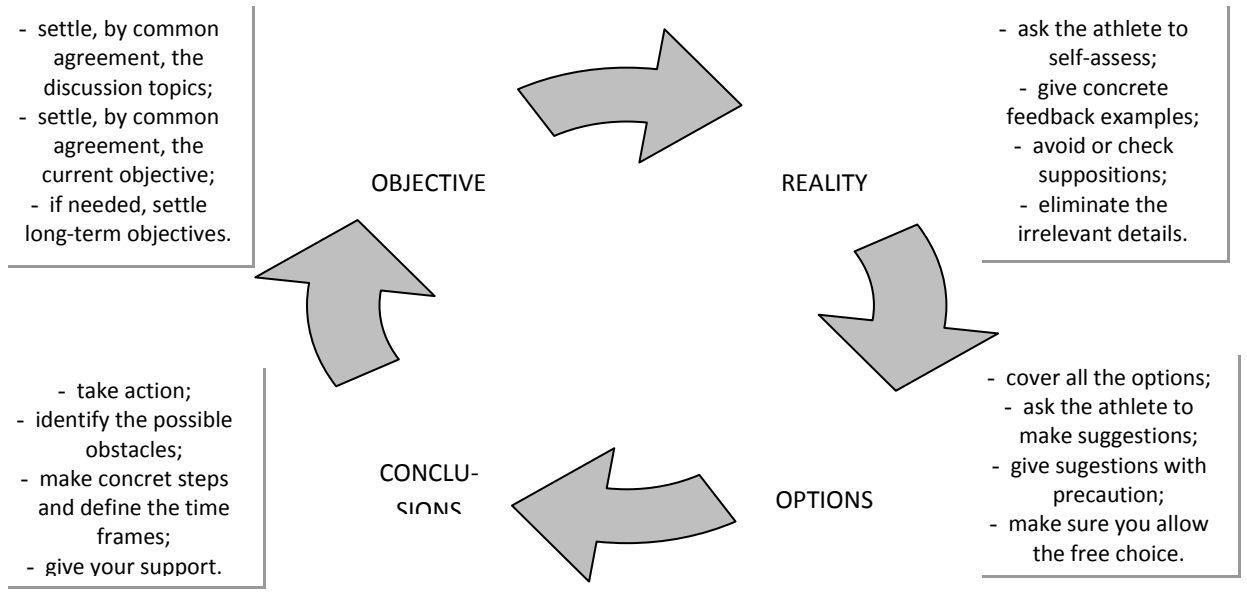

Figure 3. *The OROC model (M. Landsberg, 2005)*

Feed-back providing is one of the coach's most important aptitudes. Feed-back can be:

- ***positive*** – it consists of a simple evaluation and has a great power on the behavior reinforcement, when the coach specifies why or how the athlete has done a good job;
- ***constructive*** – it underlines the ways in which the athlete could have even better performances next time;
- ***negative*** – it describes a behavior that hasn't been successful, without proposing a solution.

- ***Monitoring***

The whole coaching process should rely on evidence and on the registered data interpretation: performance planning, analysis and evolution must be supported by sufficient and appropriate data collected during the competitions and the training sessions.

In this sense, the video-recorded data, telemetry, the evidence of procedures, their efficacy, the achieved labor, time keeping, grading, laboratory data, psychological data and so on become the monitoring prerequisites. These data will be organized, classified, intabulated, processed and interpreted.

- ***Personal and social significance***

We shouldn't ignore that the coaching process is an interpersonal activity. It has a direct impact on the involved athletes, on their close social environment, but also on the wider one. Media have an important role, because they highlight social recognition, classify and scores the way in which the coach helps the athlete achieve his status.

Conclusions

- Sports coaching is focused on the valorization of an athlete's or a team's performance capacity, in relation to the general potential and the specific performances.
- The coach possessing real managerial aptitudes can render efficient his athletes' training and can assure the expression of their maximum potential in the important competitions by the following actions: a rational analysis of the team's strengths and weaknesses; settling the team's unique objective; transposition, through practical operations, of what is thought and projected to the training and competition concrete situations; training individualization; adjustment through feed-back and feed-before; monitoring the whole training process; giving a personal and social significance.
- Among the coach's techniques, the athletes' questioning during the specific training stage, will lead to a higher awareness of the actions performed while competing and of their impact on the final result, the team's unique objective. In this sense, the present paper systematizes the possible questions in two great categories: questions for the identification of each athlete's place and role within the team, according to the tactical conception, and questions for the identification of possibilities to mobilize one's internal resources. We think that these tools induce a fundamental change of the way in which athletes perceive themselves and perceive the other teammates or opponents, their answers to questions becoming thus a personal feed-back that determines attitude and behavioral alterations which facilitate the tactical conception applying and the objective reaching.
- Coaching both requires and determines a fundamental change of the way in which athletes perceive themselves and perceive the other teammates or opponents.
- Coaching encourages the creative suggestions offered by all the team members, with no fear of being ridiculous or rejected.
- Coaching is both an attitude and a behavior, with many applications to the sports level, in general, and to the competition level, in particular.

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

❖ PHYSICAL EDUCATION AND SPORT

INCREASING MOTOR DENSITY IN PHYSICAL EDUCATION LESSON, FOR THE CHILDREN OF 11-13 YEARS

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Objective. This paper is to present and demonstrate that by using science-based methods and effective means to comply with the requirements and content of physical education lesson, and psycho-motor features of students can get an increase motor density of physical education lesson.

Methods. To verify the hypothesis and work to achieve the purpose, were used: the method of observation, explanatory method, method of questionnaires, testing method, statistical and mathematical method and graphic method, resulting in effective means, selected and applied taking into account the particular lesson and collective students.

Results. It notes that over 24 lessons, by implementing effective means, scientific and rigorously applied, motor density increased from 20% recorded in the density protocol from the first lesson ,at 44.13% from the last lesson, the progress being continuous.

Conclusions. Following the final results of the experiment, it can be said that hypothesis was checked and the purpose was achieved, can therefore conclude that the scientific application of effective means of working, and taking into account the psycho-somatic and driving features of the students is obtained an optimal motor density, leading to lesson tasks.

Keywords: motor density, growth, lessons, gymnasium, physical education

Introduction

Physical education and sports, represents and is a constant and continuous preoccupation, for all the factors which are responsible for the education of the young generations and for the state of health and propelling force of the population.

The goal of the school physical education determines the educational purposes, and this materialises on different plans and levels the general prescriptions of the goal.

The target of the physical school education, can be defined from a practical point of view, in which the main actions are set, in a historical period of time also defined from a strategical point of view, which ensures the domain's development on long term.

Another goal of the physical school education, is represented by the individual's personality development, according to the society's demands, of gaining the autonomy, of the efficiency and balance towards natural and social environment .

Taking into account the rationalization of the educational process, there appear significant changes in the aspects of the lesson methodology, this representing the way of translating the objectives of the physical school education.

To uphold this idea , Gh. Mitra and Al. Mogoş (1980), assert that, „the lesson will continue to represent, the methodical lever, through which, the pedagogue, taking action systematically in the base of a well elaborated programme, stimulating the possibilities of knowledge , the pupils' skills and interests, contributes to the development of the growing generations, for the futher participation, to the production of new material and spiritual values, to the progress of science, technique and economy".

As a completion, Gh. Cârstea in "The methodology of physical education" (1993), asserts that, „the other ways of organization of the activity of physical education (daily gymnastics, independent activity, sports activities, trips, campings), won't accomplish the lesson's role and functions, but will establish a continuation ".

As a logical continuation of the facts presented above, the specialists in the field, are continuously preoccuppied , to find ways and new solutions to lead to the growth of the pupils' physical and intellectual efficiency , in different ways of organisation.

The lesson represents the main form of organizing the educational process, because by the methodological generalizations which it contains, establishes a system of didactic demand scientifically based, capable of orientating the teaching activity of

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Received 09.05.2012 / Accepted 12.08.2012

pedagogues and trainers in order to obtain the maximum of efficiency.

Al. Mogoş and Gh. Mitra in "The methodology of physical education" (1980), define the lesson as being „the unitary pedagogical way through which generations of pupils, set up in homogeneous classes , working in groups, teams or independently, will obtain under the pedagogues' guidance and with their effort, the spiritual and material values, will assimilate the experience of life and work of the previous generations and will develop the abilities and skills, getting ready for life and social activity".

The physical education class represents an unitary pedagogical process which highlights the work of both the teacher and the pupil, the way in which the education and the schooling are made, all of this being orientated to the accomplishment of the objectives of physical education and sports .

To particularize, the physical education lesson represents the activity performed by pupils, with the guidance and lead of the physical education and sports teacher, that maximizes physical development by the development of the driving skills, they assimilate knowledge, abilities and main driving habits, utilitarian-applicative and specific for the sports domains, in an accurate period of time of 45-50 minutes.

Problem statement

The multiple tasks that need to be solved at the lesson, lesson that has a limited time, demand a special attention from the teacher when it comes to the rational use of each and every minute of time. The correct use of time and space lead to the achievement of a good lesson density .

The use in a helpful way when it comes to a lesson means taking into account certain conditions such as the uptake of the material,the execution of the exercises, the supervision of the pupils' work, to ensure active or pasive rest , auxiliary actions (putting in order the equipment), deciding the work teams.

As to fully achieve the target that the physical education and sports lesson has, and its efficiency to continue growing, a decision is needed, as compulsory, the setting of a three main tasks, not taking into account the type and the objectives of the lesson in discussion: *the optimum density, variety and attractivity.*

The efficiency of the physical education and sports lesson ought to be appreciated mainly, by the quality and quantity of the effort made by pupils during the lesson.

The maximum of efficiency when it comes to gymnasium lessons of physical education implies to strictly stick to the methodological and didactical methods, starting with setting the themes, the operational and instructive objectives, establishing the most correct content elements, telling exactly the time needed for reaching the rings, establishing a high functional and propelling density and ending with conceiving the lesson as an inseparable element part of a system of lessons and having a tight connection between instruction and education .

The quantity and quality of the effort invested in every physical education lessons is determined by its density. In fact this is the number one indicator for each and every lesson, because this makes the quality of lesson.

For every physical education lesson, which takes place in a group of pupils, the density is important only if this is applied simultaniously on individual or on groups of individuals representative from many points of view: number, level of physical development, level of motor skills, sex. The quality of lesson may be appreciated taking into account the method of putting into value the time required.

The indicator which highlights the way the time is spent is called density and represents the relation between the time spent to achieve the target of the lesson and the whole part of it.

The density is the first indicator for establishing the quality of a lesson or any other real activity, this referring to the quantity and quality of the physical effort taking into account the time component. The density can be observed, from "outside", by the professional men who have experience in "observation", but can't be analysed without real recordings basis.

The density, is considered by certain specialists in the field, the fourth effort parameter, which depends on the density's influence over the capacity of effort of the human body, this being defined as the density of effort.

The statement is partially true, because the density has a proved theorem which includes the rest of the effort parameters, volume, intensity, complexity, which express the quantity of effort invested, the types of density being according to parameters of the effort.

The parameters of the effort, as it was said above, determine the density type of the lesson, so,we can have a classification of the lesson density: *the movement density, the pedagogical density and the functional density.*

The movement density represents the relation between the time spent by pupils in an useful way for preparing for the lesson, and the full time of the lesson.

If we work with small groups of students, as in the physical education and sports activities in school, we may say that the results to be reported by using a number of subjects or by using compact groups of subjects and to take into account at least as an arithmetic mean. This action can take place in cases of scientific research, but the inspectors or methodic do not have "teams" of scientific researchers.

Anyway, as it was said in other works, there is a big mistake in saying that the teacher, who leads the lessons and wants to elaborate a methodological and

scientific work, can pay attention of the density of those lessons.

"The theory and methodology of physical education and sports" from NAPES Bucharest-National Academy of Physical Education and Sports, by using the precise synthesis of the specific bibliographical information, presents the following types of density and appropriate criteria: the volume of the physical effort, due to the time of the lesson, in our case, determines two types of density:

-The movement density (Md), represents the real time of practice/the subjects listed in the lesson time, more exactly the time spent by the subjects to put into practice the exercises, including the active brakes between the reccurences.

This density, which has a relative priority towards the other types, is calculated by using the logical formula: Md =The real working time of the subject/The lesson's scheduled time x 100.

We multiply this with 100 because there is statistically accustomed that everything to be expressed in percentage.

In the physical education lessons ,no matter their typology, as we explained above the movement density is very often used .It is true that this type of density has higher values in the lessons that have a purpose in enhancing skills and/or the movement abilities towards the lessons of 'primary initiation , in these skills and/or abilities of movement.

The experts appreciate that a good movement density must be at about 60%, this being connected to the operational objectives of the lesson.

-The pedagogical density (Pd), consists of the time spent by the way the subject is involved in the didactic process, the methods and the organization of the lesson , explanation, demonstration, corrections of the mistakes made in practice, the marking of routes/pathways, the transportation of sports materials etc.

So the pedagogical density doesn't refer to what and how much the teacher does in the teaching process, methodological and organizational.

When it comes to pedagogical density we talk about the passive breaks useful in practice. The logical formula of calculating the pedagogical density, again in percentage is the following: Pd= The time spent in an active way by the subject in the process of teaching, organisational and methodological /the time allocated x 100.

The pedagogical density value is, of course, higher in the lessons which have operational objectives of "acknowledge or primary initiation" of the movement skills and abilities when of course, there are made numerous explanations and demonstrations, many common practising mistakes are being corrected and so on.

Theoretically speaking, the sum between the movement density and the pedagogical one should be of 100%, but practically we can't have such good result, especially when we work with groups of subjects and there is some time wasted, and most of all when there is a lack of materials as it happen in Romanian schools.

The intensity and complexity of the physical effort determines a third type of lesson density –the functional density, the density that we often call the dynamic of the physical effort in lessons and other precise activities. As we can figure out from the name, this type of density is given by the progress of the main functions of the body during the lesson.

This progress, in practice, is measured by the heart rate (HR) and seldom, by the breathing frequency(BF), measured at the beginning of the lesson an during it, and at the end of it also. All the three types of density are measured only on the basis of a special protocol. The one who assists at a lesson and says, without a special protocol, that the density was weak, good or very good, makes a methodological mistake.

The density protocol shouldn't be mistaken with the lesson plan although there is a section that is alike in both cases. In order to avoid this mistake we have to make things very clear: the density protocol is established by any other person but the teacher during the lesson and the lesson plan is made by specialist before the lesson begins.

In most cases the density of physical education and sports lesson is not as it should be because of different elements, but the experience and the methodological thinking, give the useful alternatives to increase the density.

The elements that lead to a weak density and to an ineffective lesson are organizational reasons (mistakes in choosing the groups and methods of practicing lead to disorder, the lack of materials, leads to a small number of repetitions or to failure ,a lesson which is not well prepared in advance , can lead to time spent inefficiently, an improper place for this activity can lead to crowd, inadequate state of the equipment, can lead to a waste of time spent to fix it, the field or equipment which is not checked in advance can lead to accidents),of methodological nature (long and ambiguous explanations in a messy description, with improper terminology, the lack of understanding the main actions, unconvincing demonstration, the wrong execution of the exercise, the persistence in the same mistakes lead to a wrong memorizing of the exercise mechanism, irrational ways of acting, the intense use of the memory than of the body, the use of improvised elements leads to waste of precious time, the lack of interest in preparing the lesson in advance , even the lesson in progress and other emotional reasons (the lack of attractivity of the means used, the lack of games and competitions which are means of gaining the pupils' interest, lack of pupils' active participation).

Having in mind these cases and for assuring the efficiency required, some measures are asked, a

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

strong desire from the pupils by choosing a group and efficient methodological practice , direct work, in pairs, team work, encouraging and promoting the team or independent work, the use of concise and clear explanations , in order to gain the pupils' interest towards the lesson.

The measures of increasing density are nevertheless answers to action and do not need special description.

Procedures and research methods

The research hypothesis is the idea of combining in the best way the themes of the lesson, the use of the time and equipment in an efficient way, the propelling density may reach to, *pedagogigal and physiological density* may turn to the best parameters that the methodology demands (60-65% of the lesson time, representing almost 30-35 minutes).

The study took place in the 1st semester of the year 2011-2012, at Mihai Eminescu Gymnasial School in Brăila, at gymnasium, at Vth grade. I have chosen the V th grade because it makes the connection between one educational level to a more complex one. At this level, the pupils have no solid base of knowledge in this field, and have little information of the demands and terminology of the topic.

Having in mind this information, working at this educational level, means measures, ways and different and quite complex methods, for achieving an optimum of lesson density, in order to reach the goals set in mind.

There were used the following methods documentation, observation, explanation, the density protocol method, the statistic-mathematical method for interpreting the results and the graphic method.

Results

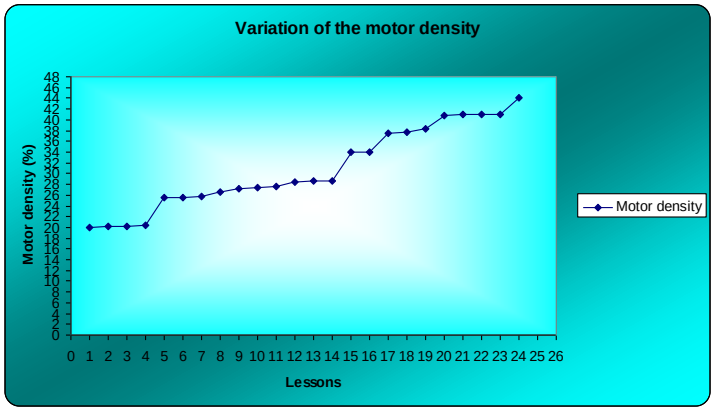
Table 1. Synoptic table

N° protocol	Motor density %	Pedagogical density %
1	20%	18.91%
2	20.02%	20.91%
3	20.18%	20.87%
4	20.44%	17.85%
5	25.47%	14.61%
6	25.53%	18.44%
7	25.78%	16.94%
8	26.53%	19.53%
9	27.14%	18.66%
10	27.31%	12.17%
11	27.53%	10.65%
12	28.52%	20.61%
13	28.61%	18.11%
14	28.66%	13.06%
15	33.94%	13.21%
16	34%	17.68%
17	37.54%	12.38%
18	37.72%	22.14%
19	38.4%	12.66%
20	40.89%	17.39%
21	41%	11.26%

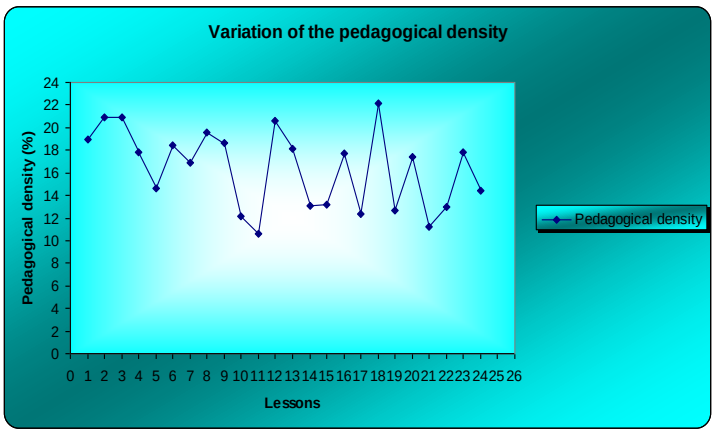
22	41%	12.93%
23	41%	17.8%
24	44.13%	14.46%

Studying the results obtained, we observe that the motor density has increased from one lesson to another but the pedagogical density had variations depending on the lesson themes .

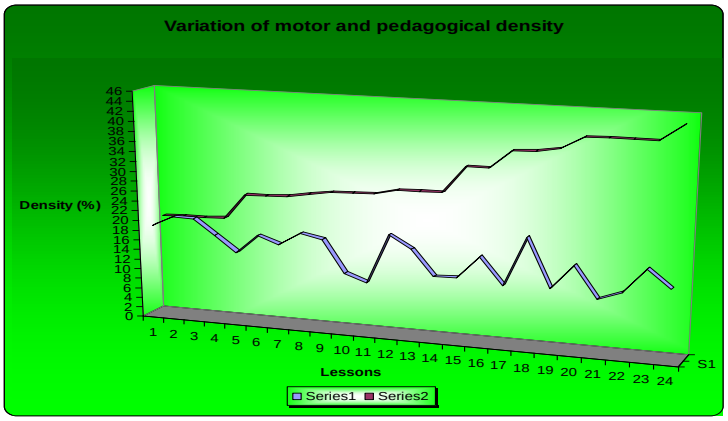
Graphic 1



Graphic 2



Graphic 3



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Discussion and conclusion

Although at the 5th grade the density is lower because there is quite a lot time lost with explanations and with multiple practice all these things coming from the fact that pupils come from primary school with a small amount of skills and movement abilities and with late reaction to tasks.

As a conclusion of the study after examinig and interpreting the results obtained , we may say that the hypothesis and the purpose of the study were checked, accomplished and confirmed.

It was revealed that choosing the most efficient systems of teaching , the best combination of methods got from abilities and movement skills made the lesson density increase in spite of all problems .

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THE IMPLEMENTATION OF METHODS USED IN ATHELTISM WITH THE PURPOSE OF DEVELOPING THE RESISTANCE DURING THE PHYSICAL DEVELOPMENT PROGRAM OF STUDENTS

DULGHERU MIRELA[1]

Abstract

Resistance is conditioned to a large extent by the psychological factors that play a stimulating and recovering role of biological processes that "supervise" this quality. Among these we mention in the first place the motivation complex and interests one. Therefore development of this quality among female students that are not athletes, becomes a difficult problem, the teacher's role is very important, his teaching skills and in particular by the selection means and the methods he uses. Knowing that the running time is not accepted by the students, this study tried to verify a hypothesis that by the implementation of certain methods used in athleticism to non-athlete students they can improve the performances from the semester control sample, running of 800 meters. The experiment was conducted on a group of 20 students, known methods and methodical procedures used for their efficacy in the scientific inquiry.

Conclusions: The working hypothesis from which we started this experiment and the experiment results analysis gives us the right to say that this was confirmed, fact proved by the performance values obtained in the final testing that were higher than the original.

Key words: methods, implementation, students, resistance.

Introduction

Strength or endurance is a motor quality that can be developed on almost any age on almost any age level with the condition to take into account the peculiarities of age, somatic-functional, psychological, sex, health status, etc.. It is known that resistance is a conditioned capacity that is based on metabolic efficiency of muscles and systems, and limiting factors are related to available energy in muscle and the mechanisms that regulate them. Resistance is the ability of the psychophysical organism to cope with fatigue specific to the work performed.

So we can say that resistance is the ability of a subject to make an effort without causing fatigue, or exceed (overcome) this phenomenon. Dragnea A. (2002) considered that the development of resistance level is reflected in high functional capacity of the nervous systems, respiratory, cardiovascular, metabolism, and the coordination capacity of the remaining systems and systems found in the body human. In the specialty literature we find different classifications of the forms of manifestation of this quality.

Resistance can occur in the forms: general strength, specific strength, anaerobic strength and aerobic strength. Ardelean T. (1982) presents the following manifestation forms, in athleticism, of resistance: resistance in speed regime or under the explosive force, cardiovascular strength and resistance with energetic character. Differentiates the forms of manifestation depending on the type of effort, so we meet: general resistance, regional resistance and local resistance, and resistance anaerobic and aerobic strength.

We believ that from a motor point of view, resistance has several forms: local, regional and global, in terms of methodology, can be: general and special, and physiologically, may be: aerobic resistance and

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Received 08.05.2012 / Accepted 09.08.2012

anaerobic resistance. General strength, specific strength, local strength and aerobic and anaerobic resistance. C. Bota (2000), presents, quoting R. Manno (1996), the following classification of forms of resistance: resistance - speed (from 8-10 sec. up to 45 sec.), short resistance (45 s to 2 min.), medium resistance (2 min. to 10 min.) long resistance I (10 min. to 35 min.), long resistance II (35 min. to 90 min.), long-III resistance (longer than 90 min.).

Resistance development is conditioned by a series of factors:

- resistance capacity
- type of muscles fibers contained in the activity;
- energy resources;
- enzymatic activity and hormonal mechanisms and adjusting cardiovascular capacity; peripheral capillarization and adjustment; blood composition;
- long capacity,
- volitional processed (boldness, perseverance),
- motivational processes.

Resistance is also conditioned to a large extent by psychological factors that play a stimulating role in the biological processes used to "supervise" the quality of this condition.

Emotional states can also cause changes in the resistance capacity. A relatively strong emotion may cause a reaction throughout the neuro-hormonal activationof the entire adreno-sympathetic system. Volitional processes are equally involved in the resistance capacity of the individual. It is important to recognize the existence of real fatigue of the body, of muscle, due to energy depletion substances or wear substances accumulation. In this case, it is not indicated that any increase in fatigue life to be resolved psychically, by fighting the feeling of fatigue.

The motivational complex and the one of interests is the most important psychological factor. It takes a strong motivation for some intense and long-term efforts to be supported. Therefore in developing this qualities among non-athlete female students, becomes a difficult problem, the teacher's role is very important, that his teaching skills and especially the selection of means and methods that it uses. Educating the capability (quality) of motor condition is not only by running, but also by other specific means.

Knowing that the running time is not accepted by the students, this study tried to verify a hypothesis that the implementation of methods used in sports training to non-athletic students can improve their performance in the control sample semester. The most common methods used in sports training for development of resistance are uniform efforts method (continuous), variables efforts method, interval training method or split.

The method of uniform efforts (continuous), is widely used in preparing beginners, especially early in the preparatory periods (basic training), mainly for the development of autonomic control systems that optimize the capture and transport activity of oxygen. The most common type is the duration running exercise regime that increases more and more the vegetative top level.

This type of effort, held close to the critical intensity, increases aerobic possibilities: thus, at beginners it is recommended a tempo equivalent to 6 to 6.5 min. / 1000 m and a heart rate of 140-150 pulse / min. while trained athletes will cross the 1000 m from 3.5 to 4 minutes. The duration running priority calls the slow fibers (red) and their oxidative enzyme suppressing the activity of fast glycolytic fibers. It is considered that maintaining a tempo run in 70-75% of VO2 max. does not contribute to the increase of aerobic capacity, but ensures that it is at that level.

During an ongoing effort to beginners, it is recommended to be between 10-15 minutes, and the athletes trained up to one hour, after which there is an overload of the cardiovascular and respiratory systems, the oxygen consumption decreases, and also the effect of the method used.

It is estimated that this method can be used by performance athletes to *return - oxygenation* after heavier training in the first period of preparation or for will develop. This method can be used to improve aerobic exercise capacity when using a heart rate of 170-180 beats / minute. Aerobic-anaerobic zone transfer (which is a high intensity exercise) may be made only by athletes with good resistance. Assay values are recommended to be changed after 4-6 weeks of use, setting new values for the next mesocycle. It is recommended that the respiratory rate does not increase from rest to exercise, more than twice.

Variables efforts method is based on altering the intensity and tempo of work in different exercises. Frequently used is the run, but the method applies to other specific means. The primary mean is running on the varied ground with repeated changes of intensity, especially due to terrain profile. It creates this type of effort, an imbalance between oxygen need and ways of ensuring it, for example by running the uphill portions. This oxygen debt determines the need for air and feeling of fatigue to be defeated.

Therefore, it is recommended that, after a portion of the hill, to follow moving downhill, aiming to ease the crossing unpleasant moments. Because dosing is relatively difficult and the times of peak loads are few and inconsistent, this system is used restrictively to athletes. It is used to educate beginners will, so we can try this method successfully for female students undergoing this test. *The method of training*

with intervals or split is used in many branches of sports with a cyclical character and in sports games. The basic principle of this method consists in a repetition due to incomplete body rebuilt after the previous repetition.

This mode enhances the ability energic-genesis lactacyd, producing metabolic acidosis by medium and submaximal lactate formation in the absence of oxygen. Practical methodology of application has as aim to modify the duration of efforts, rest interval, the tempo of work, the number of repetitions and actions of the subject during breaks. Some authors believe that the interval training is applied with an extensive version and an intensive one.

The extensive version is characterized by a high volume and low intensity of repeated and intensive version, conversely, low volume, high demand. The training in the intensive variant requests an oxygen debt between 90% and 30% of maximum force of isometric contraction, acting mainly on white muscle fibers, while red muscle fibers require extensive version (priority).

Both procedures require carbohydrate metabolism. Extensive version is used in training for long-term development efforts, while intensive form, for the prevailing of anaerobic.

Breaks between repetitions will be set to 30-90 seconds, during which allows recovery heart rate to 120-130 beats / minute, at which time a new iteration begins. It works in few series, 2-3 in number, composed of 4-3 repetitions (the lesson), because a higher volume leads to depletion of glycogen.

Experts consider that the break must be less than from a repetition to another, because the concentration of lactate in the blood increase after a few minutes after the start of the repetition, and the maximum is reached about simultaneously with the completion of work. We mention that the duration of breaks depends on the duration and intensity of each repetition, Ardelean T., (1982).

We did the brief overview of these methods in order to motivate the choosing of the methods and processes of sport performance that I thought that we can successfully use in our experiment and their implementation in the development of resistance in female students physical development program.

Work hypothesis

In our study, we developed the hypothesis that the implementation of certain development methods of the motor resistance capacity, usually used with success in sport performance, with the condition to respect and adapt the peculiarities of age, sex and sport specific activity to which currently female students participate, weekly physical education module that can improve their performance to control the tasks held quarterly.

Experiment organization and development

Description of experiment: The study was done on a group of 20 students, aged between 19 and 23 years, divided into 2 groups, students at the Faculty of Economic Sciences.

The experiment was conducted during 2009-2010, over 28 modules, each module having a duration of 100 minutes. The sports task that was behind this experiment was running resistance on 800 meters. In this experiment there were two tests, an initial one – at the beginning of the academic year (October 2009) and a final one - at the end of the academic year (May 2010).

Preparation was done according to the particularities of age, sex, health status and not least to keep in mind the weight of female students included in this experiment.

Research methods:

I used my scientific approach following research techniques and methods: observation, measurement and recording method, method study bibliographic, statistical and mathematical method, graphical method and experimental method.

Statistical data processing aimed to the following indicators: weighted arithmetic mean, the difference between mean, median, upper, lower limit, quartiles, standard deviation (S), coefficient of variation (CV). I chose a bunch of methodological procedures that we used during physical education classes that had as main objective the development of general resistance: uniform effort procedure, the procedure of repeated efforts, the process o variable and progressive efforts and sports games (volleyball, basketball and handball).

With the help of uniform process efforts intensity has remained constant throughout the practice of female students, in exchange the volume grew in the same lesson or from a lesson to another, progressively, according to the plan (ie,. Distance running from 300m to 1000m, 1200m or even changes in relation to time, by increasing running duration from 2 to 10 minutes).

Also, through the process of repeated efforts intensity remained constant throughout exercising but made the same unit of effort (distance) several times, repeating the effort standard pattern (eg 3x400 m).

Movement games, sports games have lacked the schedule were used to develop general strength, intensity and gradually increasing the time devoted to sports.

The Fartlek - a means of developing resistance to commonly used in sports performance, especially in athletics during periods of accumulation, general physical preparation, its execution time increased from 5 minutes to 15 minutes.

Active break was chosen as a complementary method of recovery, expressed walking, breathing

movements, recovery duration varies depending on the value of heart rate values were higher than the rest. The average duration of breaks was approximately 90 sec. - 2 min. to 3 min., the heart rate is around the threshold of 130 bpm. Examples of action systems that were used in the experiment:

- Alternating the brisk walking with the running in uniform tempo (2x 6 min, break 1-3 min).
- Slow rim in uniform tempo (8-10 min.).
- Repeated run (3-4 x 400m).
- The Fartek 10-15 min
- Sport games
- Relay
- Applied tracks (jumps, weight transport, climbing up the fixed stairs, walking in equilibrium) – 5-6 repetitions connected nu slight run.

To achieve the objective of developing general strength, I helped by traditional means (used in sports training), all this means respecting pedagogical principles aimed at educating quality motor resistance.

Obtained results

Statistical data and charts from records, processing the data obtained after completion of the experiment described above, are found in Table 1, where values of the statistical calculations of initial and final performance of resistance and Figure 1, where averages are presented graphically developments in performance sample that have evolved resistance to students who have been subjected to experiment.

From these results the effectiveness of the methods we implemented, reflected in increasing the capacity of resistance and consequently the progress reflected in performance that students have achieved the final testing.

Conclusions

The working hypothesis from which we started this experiment and the experiment results analysis gives us the right to say that this was confirmed, as evidenced by performance values obtained in the final testing that were higher than the original.

After interpreting the results, their analysis and synthesis, we consider necessary to make the following conclusions.

- Methods of developing resistance psychomotor ability, used in sport performance, namely athletics, provided much needed to be adapted to the peculiarities of age, gender, somatic development and physical education activities specific to female students, may lead to improve overall strength.
- We support the idea that the development of this quality is welcomed also in this age segment, because they know that there is a tendency to towards a sedentary life.
- We believe that an important role in meeting this objective it is a motivational factor, especially when subjects, in our case are non-athlete students.
- Sports, dance, relays and applied tracks are means approved by students and often used in educating the general resistance, but should not be neglected the methodological procedures established, verified, used in athletics, respectively in semi fond samples, background.
- Resistance is a psychomotor skill that can be improved, over its development we can act being able to achieve superior results in old age.
- The development of this quality does not require exceptional material facilities.
- It is imperative to respect this quality in psychomotor development continuity in the methods proven effective, often causing the continuity of progress.

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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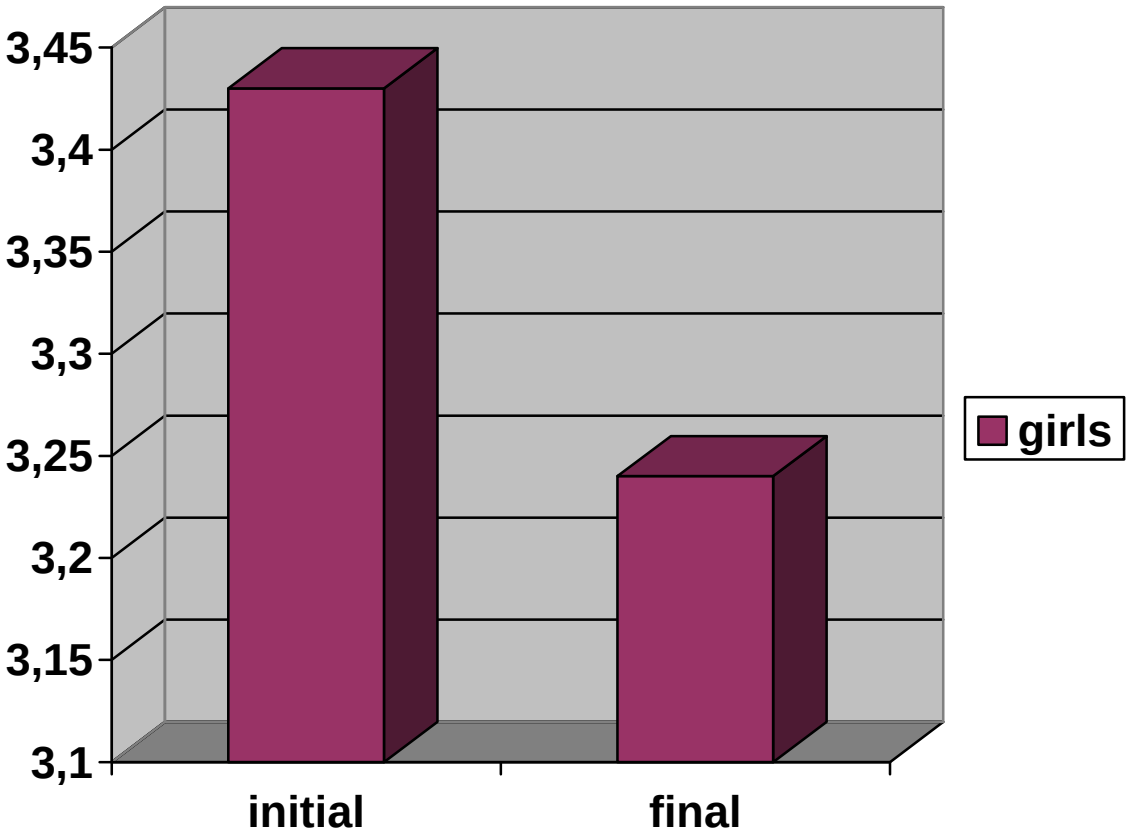
Table 1. *Table with the calculated statistical values of the initial and final parameters*

	INITIAL TESTING	FINAL TESTING
No of tested students	20	20
Arithmetic mean (min.)	3,43	3, 24
Means difference (sec.)	-	14,1
Superior limit (max.)	4,27	4,00
Inferior limit (min)	3,38	3,20
Lower Quartile (min)	3,41	3,35
Median (min)	3,51	3,38
Upper Quartile (min.)	3,58	3,44
Standard deviation	14,08	10,08
Coefficient of variability	6,02	4,89
Amplitude (sec.)	50	42

Figure 2. *The evolution of the mean results at the resistance tasks in the initial and final tests*



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ANALYSING THE EFFECTS OF A PERSONALISED PROGRAM OF PSYCHO-MOTOR EDUCATION ON SOMATIC AND MORPHO-FUCTIONAL CHARACTERISTICS OF FEMALE STUDENTS

DUMITRESCU REMUS[1]

Abstract

This study evaluates the effectiveness of a personalised program of educational psycho-motor skills through an analysis of basic somatic and morpho-functional characteristics of female students and its comparison with the results obtained for a control group that followed a non-personalized software.

First, a graphical data analysis was performed, as well as data validation and Kolmogolov-Smirnof, Cramer-von Mises and Anderson-Darling normality tests. For statistical analysis the T test was used for paired samples, the Wilcoxon test, the F test and linear regression. Also, the jackknife technique was used for data replication and results validation.

Keywords*:* personalised training programs for psycho-motor skills, fitness.

Introduction

In individual development, the importance of relationship-exercise nutrition is an essential factor in maintaining an optimal health status, and / or improving health and physical and psychological comfort.

Westcott, W., quoted by Quinn, E. (1994), shows that women who are physically active and retain their muscle tones, have a balanced metabolism and good control of body weight compared with sedentary women.

Experimental studies made by Willmore, H., & Costill, D. (1998), in animals and humans have shown that subjects undergoing food deprivation can lose up to 25% of body weight, a loss that is recovered quickly after the return to a normal diet. A hipercaloric diet leads to an increase of 15% - 20% in weight, which regress with the cessation of the diet.

Scope. The analysis of the effects of fitness in the physical education lessons, undertaken by female students in the University of Bucharest in order to obtain a positive effect in terms of somatic and morpho-functional parameters.

Hypothesis 1 - Making an individualized program of physical training improves physiological and morphological parameters of female students, with positive consequences for their health and physical welfare.

Hypothesis 2 – By applying an individualized, well established, fitness program, through the sizing of the load evolution, depending on characteristics and the progress obtained, it is possible to obtain a significant improvement in quality and effectiveness of lessons.

Methods and research techniques.

- Direct observation;
- Indirect observation.

The Sidentrop, D. & Tannehill, D. system (2000), *Developing teaching skills in Physical Education* was used for data registry. The system involves taking a period of time, in which the subjects are observed and their activities are classified.

The experiment was conducted on a sample of 20 subjects - 20 subjects **experimental group - control group**. At the start of the experiment, students were in their first year of college, all opting for fitness as a means of achieving their physical education course.

The subjects are female students in 16 faculties of the University of Bucharest aged between 18 and 22 years, registered in the medical department on the state of health.

Venue of the experiment. The experiment was conducted during two academic years 2009-2010 and 2010-2011, in room no. 1 inside the Faculty of Law, 36-46 Kogalniceanu Blvd. This room is specially equipped for physical education courses with topics on fitness and it is where preparations, measurements and initial and final testing was carried out.

Duration and stages. The annual training plan of the university was respected with on physical education lesson per week, including holidays and exam periods.

According to our research objectives there were several types of measurements carried out: ***somatic*** and ***general motric***

Data processing methods for small size samples

For this study the jackknife re-sampling method was used, consisting of recalculating basic statistics (mean and dispersion) of the sample data obtained by omitting successively an observation of the sample basis. In the present case the new samples were obtained through 12 draws for every 11 observations by successive omission of one of the observations (the first observation in the first extraction, the second in the second extraction, etc..), resulting in a total of 121 observations for each cell analysis: the experimental group, the initial test (IT) and final test (FT), and control group, initial testing (IT) and the final test (FT).

The re-sampling and calculation of basic

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Received 06.05.2012 / Accepted 10.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

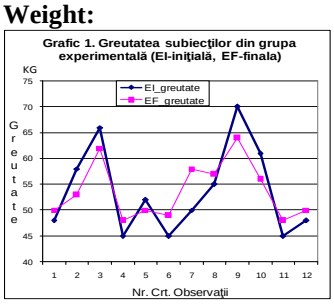
statistical parameters was performed using an SAS macro program and the statistical assumptions calculation was performed by direct application of statistical formulas using Excel.

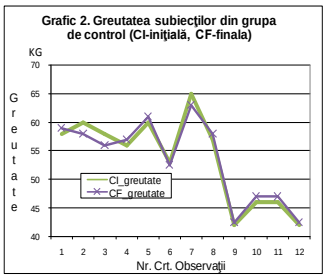
From the data measurements on the study participants the following variables were selected for analysis:
- Weight:
- The perimeter of the chest at inspiration (PTORINS):
- The Perimeter of the thighs at rest (PCOASR):
- Horizontal Rowing (RowingORIZ):
- Squats with bar on shoulders (GenoBara):
- Dynamometers left (DianmoS):
- The Cooper test (TCooper):

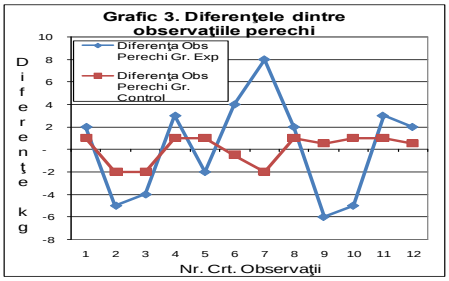
The duplicate data was eliminated, thus reducing the total samples to 12 subjects with single observations, both for the experimental group and for the control group.
- For the experimental group: 1,2,3,4,5,6,7,8,9,10,17,20
- For the control group: 1,2,3,4,5,6,7,8,9,10,19,20

The corresponding null hypothesis of the normality tests is that the data has a normal distribution. Thus, P values higher than the 5% limit indicate a normal distribution, while lower values lead to rejection. The cases where the normality hypothesis was rejected are those for which at least two tests had P values below 0.05.

Weight:







The analysis of the results obtained by applying the T test to the experimental group and the Wilcoxon test to the control group confirms the H0.1 hypothesis. Thus, the differences between the averages are not significant; the P values are well above the accepted threshold of significance of 0.05.

Table 1: Results for the significance of the average body weight

t-Test: Paired Two Sample for Means

	EI_greutate	*EF_greutate*
Mean	53.583	53.75
Variance	72.629	30.75
Observations	12.000	12
Pearson Correlation	0.886	
Hypothesized Mean Difference		0
df	11.000	
t Stat	-0.130	
P(T<=t) one-tail	0.449	
t Critical one-tail	1.796	
P(T<=t) two-tail	0.899	
t Critical two-tail	2.201	

Wilcoxon Two-Sample Test	
Statistic	151.5
Normal Approximation	
Z	0.0583
One-Sided Pr > Z	0.4768
Two-Sided Pr > |Z|	0.9535
t Approximation	
One-Sided Pr > Z	0.477
Two-Sided Pr > |Z|	0.954
Z includes a continuity correction of 0.5.	

The increased variability of the weight values of the experimental group compared to the control group is confirmed by the F test. The P value of 0.00016 for the significance test leads to the rejection of H0.2 and confirms the alternative hypothesis.

F-Test Two-Sample for Variances

	Diferenta Observatii Perechi E	*Diferenta Observatii Perechi C*
Mean	0.1666667	0.04166667
Variance	19.606061	1.70265152
Observations	12	12
df	11	11
F	11.515017	
P(F<=f) one-tail	0.000162	
F Critical one-tail	2.8179305	

Table 2: The F test results for differences in body weight dispersion

The regression analysis performed for the control group confirms H0.3 hypothesis, but does not confirm it for the experimental the group.

The negative slope of the regression line -0.44, with P value of 0.005 and R2 coefficient of 0.647 leads to accepting the alternative hypothesis for the experimental group, namely that for a higher initial weight, the weight loss is more rapid and greater increase in weight corresponds to a lower initial weight.

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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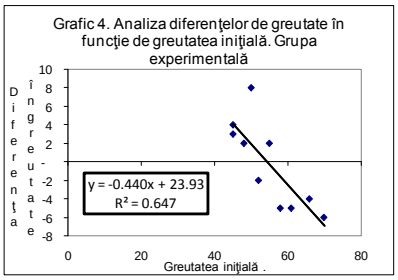
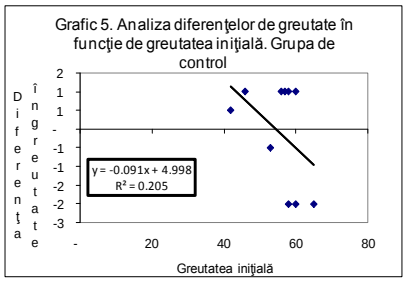
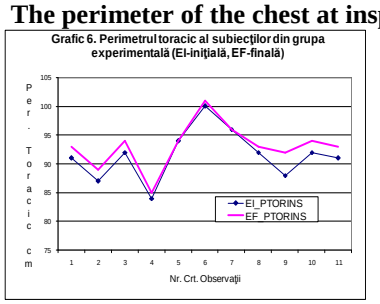


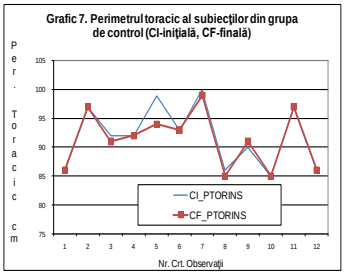


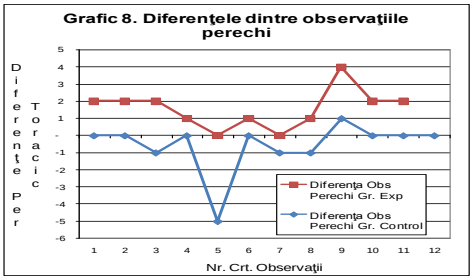
The T test statistics calculated for each sample separately gave a value of 0.1422 for the experimental group and a value of 0.1631 for the control group.

For the F test the value obtained was 3.11, which is higher than the critical F value of 2.82 at a significance level of 5%. This leads to the rejection of hypothesis H0.2. and the conclusion that the differences in weight between the two groups involved in psycho-motor training programs are significant.

The perimeter of the chest at inspiration (PTORINS):







The analysis of the results obtained by applying the Wilcoxon test for the experimental group and the T test to the control group confirms the H0.1. hypothesis for the data that includes the aberrant observation.

t-Test: Paired Two Sample for Means
Fără outlier

	CI_PTORINS	*CF_PTORINS*
Mean	91.2727	91.0909
Variance	27.0182	26.2909
Observations	11	11
Pearson Correlation	0.9933	
Hypothesized Mean Difference		0
df	10	
t Stat	1	
P(T<=t) one-tail	0.1704	
t Critical one-tail	1.8125	
P(T<=t) two-tail	0.3409	
t Critical two-tail	2.2281	

Hypothesis H0.2 is rejected based on the P value of 0.034 and it can be concluded that the effects of personalized methods of psycho-motor training on

Table 3: Results of the significance tests for the average chest perimeter at inspiration.

t-Test: Paired Two Sample for Means

	CI_PTORINS	*CF_PTORINS*
Mean	91.9167	91.3333
Variance	29.5379	24.6061
Observations	12	12
Pearson Correlation	0.962164	
Hypothesized Mean D	0	
df	11	
t Stat	1.342638	
P(T<=t) one-tail	0.103220	
t Critical one-tail	1.795885	
P(T<=t) two-tail	0.206440	
t Critical two-tail	2.200985	

developing the chest area are superior to traditional methods.

Table 4: Results of the F test for the dispersion of the chest perimeter differences

F-Test Two-Sample for Variances

	Diferenta Observatii Perechi E	*Diferenta Observatii Perechi C*
Mean	1.545454545	-0.583333
Variance	1.272727273	2.2651515
Observations	11	12
df	10	11
F	0.56187291	
P(F<=f) one-tail	0.186450991	
F Critical one-tail	0.339794264	

F-Test Two-Sample for Variances
Fără outlier

	Diferenţa Obs Perechi Gr. Exp	*Diferenţa Obs Perechi Gr. Control*
Mean	1.5455	-0.1818
Variance	1.2727	0.3636
Observations	11	11
df	10	10
F	3.5	
P(F<=f) one-tail	0.0304	
F Critical one-tail	2.9782	

The small negative slope of the regression lines and coefficients R^2 of less than 25% lead to the acceptance that the development of the chest area of the participants in the psycho-motor training program is not influenced by their initial values. It is to be mentioned here that omitting outlier reduced the absolute slope of the regression coefficient and R^2 which becomes completely insignificant.

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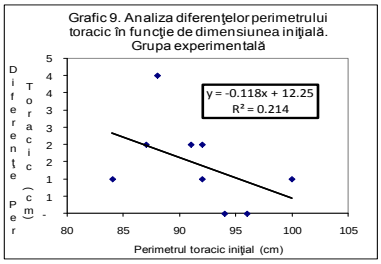
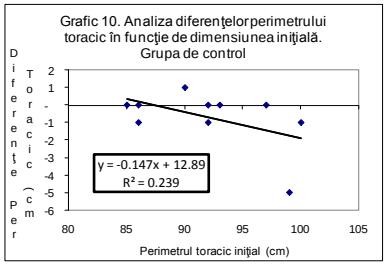
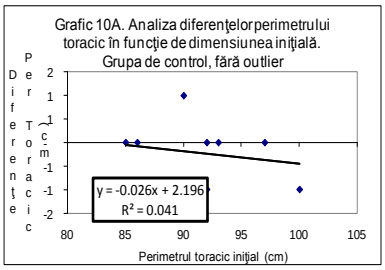
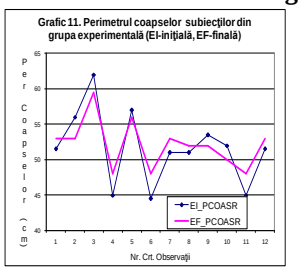


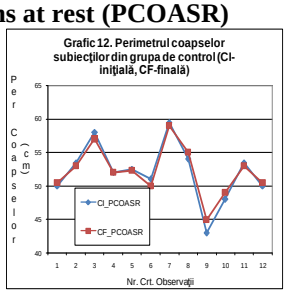




The T test statistics calculated for each sample separately gave values of 2.76 for the experimental group and 0.67 for the control group. For the F test, a value of 1.277 was obtained, which is lower than the F critical value of 2.82 at a significance level of 5%. This leads to acceptance of the hypothesis H0.2.

The Perimeter of the thighs at rest (PCOASR)





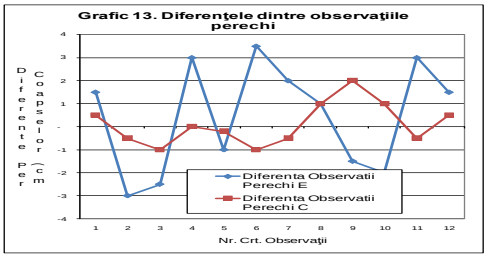


Table 5: Results of the significance tests for the average of the perimeter of the thighs at rest

The differences between the means are not significant; the P values are well above the accepted threshold of significance of 0.05. In conclusion it can be said that participation in psycho-motor training programs does not affect the average perimeter of the participants' thighs.

t-Test: Paired Two Sample for Means

	CI_PCOASR	*CF_PCOASR*
Mean	52.0833	52.1917
Variance	18.8106	13.7408
Observations	12	12
Pearson Correlation	0.9865	
Hypothesized Mean Difference	0.0000	
df	11.0000	
t Stat	-0.4115	
P(T<=t) one-tail	0.3443	
t Critical one-tail	1.7959	
P(T<=t) two-tail	0.6886	
t Critical two-tail	2.2010	

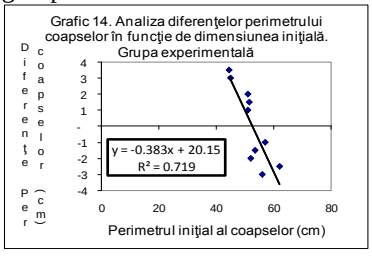
Table 6: Results of the F test for the dispersion of the differences in perimeter of the thighs

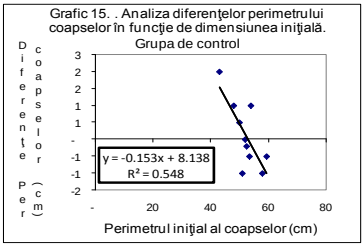
F-Test Two-Sample for Variances

	Diferenta Observatii Perechi E	*Diferenta Observatii Perechi C*
Mean	0.4583	0.1083
Variance	5.4299	0.8317
Observations	12.0000	12.0000
df	11.0000	11.0000
F	6.5284	
P(F<=f) one-tail	0.0021	
F Critical one-tail	2.8179	

The P value of 0.021 obtained for the F test leads to the rejection of hypothesis H0.2, concluding that the effect of personalized method of psycho-motor training on musculoskeletal development differs significantly from that of the traditional method.

It also shows that the impact is much greater for the experimental group; the regression slope is more than double that for control group and the R^2 coefficient exceeds 70%.





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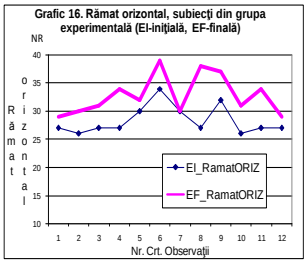
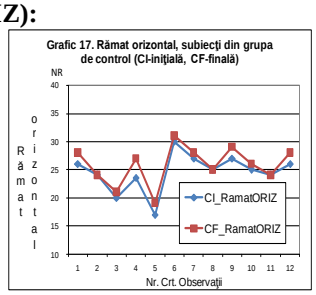
The T test statistics calculated for each sample separately gave values of 0.162 for the experimental group and values of 0.638 for the control group. Being well below the critical t value of 1.8, the results confirm the hypothesis H0.1

For the F test the value obtained is 2.57, which is lower than the critical F of 2.82 at a level significance of 5%. This leads to the acceptance of hypothesis H0.2.

Horizontal Rowing (RowingORIZ):





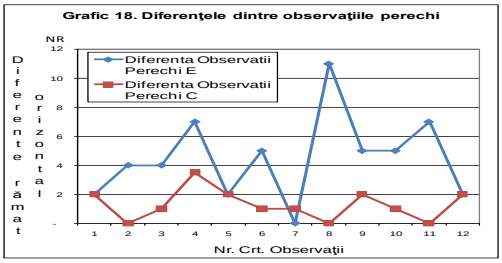


Table 7: Results of the significance tests for the average of the number of horizontal rowings

Wilcoxon Two-Sample Test	
Statistic	98.5
Normal Approximation	
Z	-2.979
One-Sided Pr < Z	0.0014
Two-Sided Pr > |Z|	0.0029
t Approximation	
One-Sided Pr < Z	0.0034
Two-Sided Pr > |Z|	0.0067
Z includes a continuity correction of 0.5.	

t-Test: Paired Two Sample for Means

	CI_RamatORIZ	*CF_RamatORIZ*
Mean	24.5417	25.8333
Variance	11.4299	11.7879
Observations	12	12
Pearson Correlation	0.9522	
Hypothesized Mean Difference	0	
df	11	
t Stat	-4.24364	
P(T<=t) one-tail	0.00069	
t Critical one-tail	1.79588	
P(T<=t) two-tail	0.00138	
t Critical two-tail	2.20099	

The analysis of the results obtained by applying the Wilcoxon test for the experimental group and the T test for the control group disproves the H0.1. hypothesis.

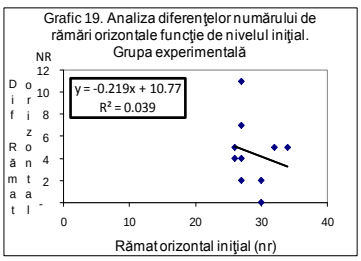
The differences between the means are significant; the P values are far below the accepted significance of 0.05. In conclusion it can be said that participation in psycho-motor training programs positively affects the development of the back muscles and the bodies of the participants.

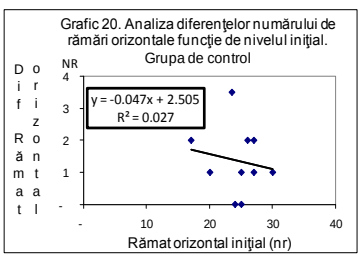
Table 8: Results of the F test for the dispersion of the differences of the number of horizontal rowings

The P value obtained for the F test leads to the rejection of hypothesis H0.2, thus concluding that the effect of personalised psycho-motor training method on the back and trunk muscle development differs significantly from that of the traditional method. This conclusion was verified by using the F test through re-sampled data. The F statistics of 4.24, far better than the 2.81 critical level of 0.05, confirms the correctness of the decision to reject the hypothesis H0.2.

F-Test Two-Sample for Variances

	Diferenta Observatii Perechi E	*Diferenta Observatii Perechi C*
Mean	4.5	1.29166667
Variance	8.636364	1.11174242
Observations	12	12
df	11	11
F	7.768313	
P(F<=f) one-tail	0.000996	
F Critical one-tail	2.81793	





Squats with bar on shoulders (GenoBara)

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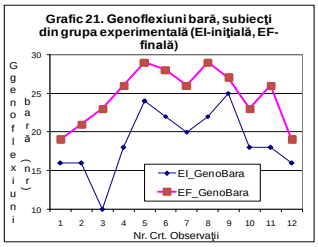
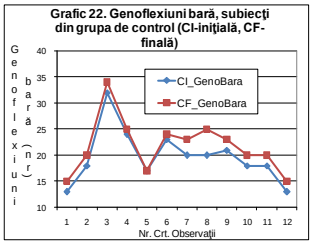




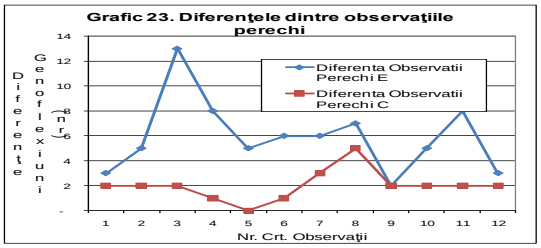


Table 9: Results of the significance tests for the average number of squats with a bar of 10 kg on shoulders

t-Test: Paired Two Sample for Means

	CI_GenoBara	*CF_GenoBara*
Mean	19.7500	21.7500
Variance	26.2045	27.4773
Observations	12	12
Pearson Correlation	0.9732	
Hypothesized Mean Difference		0
df	11	
t Stat	-5.7446	
P(T<=t) one-tail	0.0001	
t Critical one-tail	1.7959	
P(T<=t) two-tail	0.0001	
t Critical two-tail	2.2010	

t-Test: Paired Two Sample for Means

	EI_GenoBara	*EF_GenoBara*
Mean	18.7500	24.6667
Variance	17.2955	12.9697
Observations	12	12
Pearson Correlation	0.7223	
Hypothesized Mean Difference		0
df	11	
t Stat	-6.9774	
P(T<=t) one-tail	0.0000	
t Critical one-tail	1.7959	
P(T<=t) two-tail	0.0000	
t Critical two-tail	2.2010	

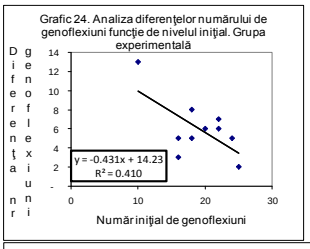
The analysis of the test results obtained by applying the T test to both groups denies hypothesis H0.1.

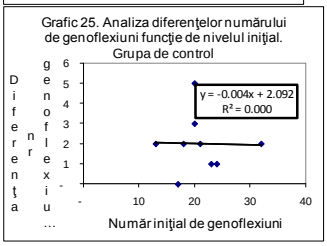
The differences between the averages are significant; the P values are far below the accepted significance of 0.05. It can be said that participation in training psycho-motor programs positively affects leg muscles development.

F-Test Two-Sample for Variances

	Diferenta Observatii Perechi E	*Diferenta Observatii Perechi C*
Mean	5.917	2.000
Variance	8.629	1.455
Observations	12	12
df	11	11
F	5.9323	
P(F<=f) one-tail	0.0032	
F Critical one-tail	2.8179	

Table 10: Results of the F test for the dispersion of the differences for the number of squats with bar on shoulders

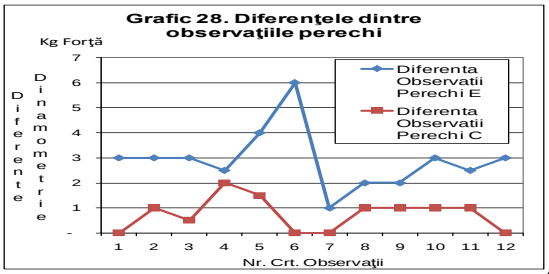




The significant coefficient R^2 and slope of the regression of -0.431 with a P value of 0.046, leads to the conclusion that leg muscles development for the participants in a personalised psycho-motor training program is influenced by its initial values.

The F test statistics obtained for the data sample is 2.83, confirming that the limit of personalised psycho-motor training program has higher effects than the traditional program.

Dynamometers left (DianmoS)



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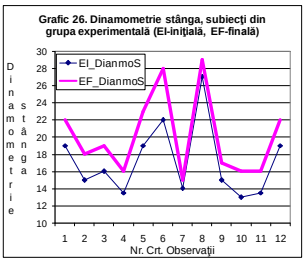


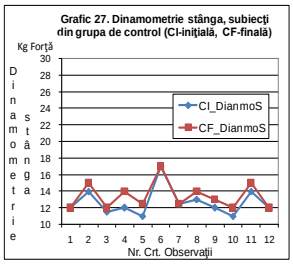


Table 11: Results of the significance tests for the average number of dynamometers left

t-Test: Paired Two Sample for Means

	EI_DianmoS	*EF_DianmoS*
Mean	17.1667	20.0833
Variance	17.7424	22.6288
Observations	12	12
Pearson Correlation	0.9702	
Hypothesized Mean Difference		0
df	11	
t Stat	-8.2705	
P(T<=t) one-tail	0.0000	
t Critical one-tail	1.7959	
P(T<=t) two-tail	0.0000	
t Critical two-tail	2.2010	

Wilcoxon Two-Sample Test	
Statistic	125
Normal Approximation	
Z	-1.447
One-Sided Pr < Z	0.074
Two-Sided Pr > |Z|	0.1479
t Approximation	
One-Sided Pr < Z	0.0807
Two-Sided Pr > |Z|	0.1614
Z includes a continuity correction of 0.5.	

The analysis of the results obtained by applying the Wilcoxon test for the control group disproves hypothesis H0.1, by comparison, the T test for the experimental group disproves hypothesis H0.1, the very low P value showing that the muscle force of the arms increases significantly for the experimental group.

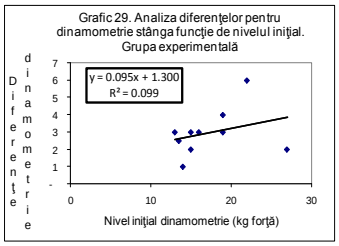
F-Test Two-Sample for Variances

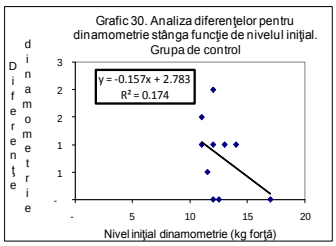
	Diferenta Observatii Perechi E	*Diferenta Observatii Perechi C*
Mean	2.9166667	0.75
Variance	1.4924242	0.43181818
Observations	12	12
df	11	11
F	3.4561404	
P(F<=f) one-tail	0.0254438	
F Critical one-tail	2.8179305	

Table 12: Results of the F test for the dispersion of the differences for dynamometers left

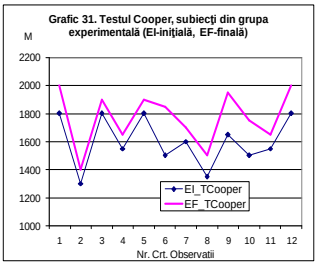
The P values obtained for the F test statistic leads to the rejection of hypothesis H0.2

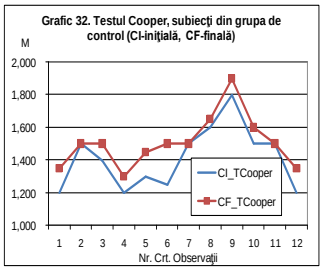
T test statistics calculated for each sample separately gave values of 3.9 to for the experimental group and 2.73 for the control group. Being well above the critical t value of 1.8, the results refute hypothesis H0.1. The F test statistics obtained for the data sample is 3.21, confirming that the personalised psycho-motor training program has significantly superior effects compared to the traditional program.





The Cooper Test (TCooper):





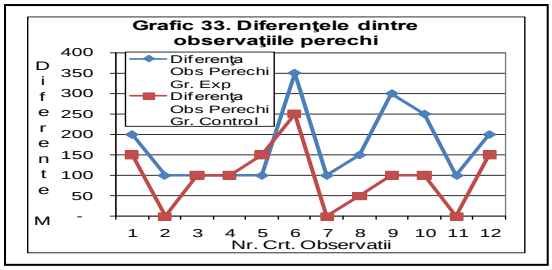


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Table 13: Results of the significance tests for the Cooper test

t-Test: Paired Two Sample for Means

	EI_TCooper	*EF_TCooper*
Mean	1600.0	1770.8
Variance	30909.1	38390.2
Observations	12	12
Pearson Correlation	0.8907	
Hypothesized Mean Difference		0
df	11	
t Stat	-6.6431	
P(T<=t) one-tail	0.0000	
t Critical one-tail	1.7959	
P(T<=t) two-tail	0.0000	
t Critical two-tail	2.2010	

t-Test: Paired Two Sample for Means

	CI_TCooper	*CF_TCooper*
Mean	1412.5	1508.3
Variance	35511.4	25378.8
Observations	12	12
Pearson Correlation	0.9198	
Hypothesized Mean Difference		0
df	11	
t Stat	-4.4115	
P(T<=t) one-tail	0.0005	
t Critical one-tail	1.7959	
P(T<=t) two-tail	0.0010	
t Critical two-tail	2.2010	

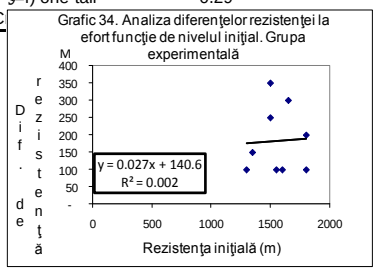
The results of both tests refute hypothesis H0.1 with high significance for both P values. It can be concluded that both psycho-motor training methods have a beneficial effect on enhancing resilience to exercise of the participants.

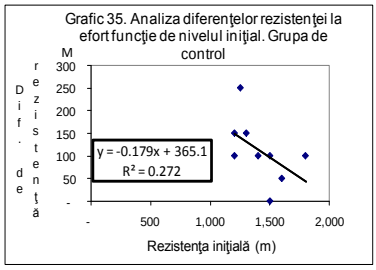
Table 14: Results of the F test for the dispersion of the differences of the results of the Cooper test

F-Test Two-Sample for Variances

	Diferenta Observatii Perechi E	*Diferenta Observatii Perechi C*
Mean	170.83	95.83
Variance	7935.61	5662.88
Observations	12	12
df	11	11
F	1.40	
P(F<=f) one-tail	0.29	
F C		

The P value obtained for F test statistic leads to confirm hypothesis H0.2. Thus it can be concluded that the effect of the personalized psycho-motor training method on the body's ability to withstand prolonged effort is superior to that achieved by the traditional method.





The small negative slope of the regression lines and the R^2 coefficients of less than 30% lead to accepting that the development of the chest area in the participants to the psycho-motor training programs is not influenced by its initial values.

The F test statistic of 1.59, lower than the critical F value of 2.82 at a significance level of 5%, confirms the previous result and thereby validates the hypothesis H0.2.

Conclusions and recommendations

The overall evaluation of somatic effects leads to the conclusion that both psycho-motor training programs have differentiated effects on participants. A simple statistical analysis on the differences between initial and final values of somatic characteristics would lead to the false conclusion that these programs do not have a significant influence on them. That is wrong if we consider that these programs are aimed at harmoniously developing the bodies of the participants, a development that to some extent takes the initial coordinates of the participants for personalized training, and not an absolute improvement of somatic parameters, namely body weight.

Regression analysis results, coupled with that of the T test, the Wilcoxon test and F test confirms that participants have made progress in harmoniously developing their bodies, the somatic parameters evolving to standard values, appropriate for their age and their generally good health status. The effect is apparent in the weight and perimeter of the thighs, the exercises having a significant regulatory effect on them. The advantage of practicing personalized methods is obvious when we consider that the phenomenon of regression to the mean is more pronounced for participants in this program.

Morph-functional parameters results reflected the efficiency of different methods of training the participants, with visible effects for the experimental group for the horizontal rowing parameters (the measure for the development of the trunk and back muscles), squats with the bar on shoulders (the measure for locomotor development) and dynamometers left (the measure of arm muscle development). For the Cooper test (the measure of resistance to prolonged effort), however, the results obtained by participating in two psycho-motor education programs show similar performance statistically.

Based on the results, it can be concluded that the effects of personalised psycho-motor training program are higher for most parameters analyzed, although prospects vary according to their nature.

In the case of somatic parameters, regression to the mean is noticeably stronger for the experimental group for body weight and the perimeter of the tights.

For the chest perimeter, the results are comparable between the two groups; there was no clear indication of the superiority of a method over the other.

In the case of morpho-functional parameters, the personalised training method gave superior results for three parameters, horizontal rowing, squats with the bar on shoulders and dynamometers left. For the other parameters, no significant differences between the two programs other than the average regression of the squats with bar, but at the same time it cannot be concluded from the results obtained that the method is inferior to traditional methods.

The results indicate also provide the best method of planning and analysing of the effects of psycho-motor training programs. Thus, their primary objective, the harmonious physical development of the participants, should be evaluated primarily based on the baseline characteristics of the participants and from knowledge of specific somatic parameters such as age, gender and size.

The Jackknife re-sampling technique was a key tool in improving the analysis and validation the results.

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THE CONDITIONAL MOTOR CAPACITIES – RESISTANCE AND FORCE DURINT THE UNIVERSITY PHYSICAL EDUCATION CLASS

FINICHIU MARIN[1]

Abstract

Purpose: Physical condition progresses, the premises of speed development are created, but also of strength, resistance and intermediate and coordination capacity, motor skills reinforced in previous stages, pre-university school education should be further improved. The composition of physical exercises for young people is confused with that of adults. Conditional expression level of capacity and the coordination is higher; deficient attitudes caused by vicious positions are identified and work is currently under progress to combat them. Exercise programs are selected taking into account the changes in growth of the body and are made so as to contribute to the harmonious development of body, favorably influencing general health status and intellectual activity.

Methods: The methods and research techniques used are part of proper investigation methods (observation, experiment) and processing methods, analysis and interpretation of collected data (statistical, mathematical, graphic) by measuring and assessing the level of expression of resistance force under local and cardio-respiratory resistance.

Results: The systematic and consistent application of the established motor program had a beneficial effect on the level of expression of the two conditional capacities studied on the 50 young people. After final testing in May 2011 in all 6 assessment tests, increases of their manifestation values were recorded, even if some have a value slightly above the minimal set.

Conclusions: The calculation of statistical indicators of motor performance at the conditional capacity level – strength and resistance, after final testing, for the pattern under investigation, presents a significant increase of the arithmetic means of the motor parameters, compared to initial testing and the minimal set. The university physical education lesson is the only way of preparing and improving physical condition, health education for a healthy lifestyle. Physical condition, through its objectives to improve conditional capacities strength and muscular resistance, can increase the ability to solve problems of daily life to prevent accidents. Designing and planning university physical education allows us to achieve the instructive - educational objectives of university physical education and sports subsystem, in order to achieve a functional independence throughout life.

Key words: conditional motor capacity, resistance, force, lesson, physical education.

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Received 05.05.2012 / Accepted 11.08.2012

Introduction and research objectives

In accordance with the theory of the examination and grading of students, applicable to all objects of education and therefore to physical education, the effectiveness of teachers is evaluated mainly by the progress that the subjects have made in acquiring knowledge, training skills, and developing motor skills. Developing motor skills requires a rigorous objectification of the physical training process of subjects. The objectification of the training process refers to the establishment of some concrete ways of quantitative and qualitative assessment of progress on which to evaluate and value methods, procedures and means used. Motor skills development is an area that gives us ample and concrete opportunities of objective assessment of progresses achieved by subjects, of the quality of work performed by them and teachers.

Physical education and sport practice shows that the level of motor skills development, largely determines the fulfillment of the requirements within the discipline programs regarding the broadening and improvement of the knowledge system, skills and motor habits in students. Their motor abilities are unique parameters through which we can determine the value and contribution of each to achieve different motor actions. Thus, to determine the amount of force, the standard parameters used is - load, for speed - swiftness of movement, for resistance – the action duration, and for skill - the complexity and precision of the action.

Conditional motor capabilities such as speed, strength and endurance are located in the capacity group directly dependent on physical condition, based on metabolic efficiency of muscles and other equipment and systems (cardio-vascular, respiratory, nervous system). Limiting factors of conditional capacities are related to the amount of energy available in the muscle and the mechanisms that regulate energy flow (enzymes), speed and force of contraction and number of motor units involved in the activity.

Because during the physical education lesson, the means primarily used mainly address the achieving of the physical education objectives, of an optimal physical condition. In the research that we will approach we will address only the physical state conditioned by the health state by which each individual can improve their expression of components of physical condition, even if the motor performance level is low. Cardio-respiratory resistance represents the element that most characterizes the expression level of individual physical condition, systematic and continuous repetition of the program of sports activities

gives the body energy increase without the installation of fatigue.

Motor capacity or motor resistance is an easily perfectible quality. As a result of ongoing and systematic specific exercises, it can be kept at peak value for a long period of time. Resistance is the perfectible motor ability that is maintained a long period of time. For it, some basic requirements must be respected, and of these requirements the most important is continuity – the major rule that requires planning per semester or academic year of actions that can help develop resistance; the continuing growth of duration or distance growth and the continuous assessment of progress; the development of running is indicated to be performed through duration running on varied terrain; the interval training method is not indicated during classes, as this method requires knowledge of the possibilities of each individual.

The development of aerobic capacity leads to improvements in aerobic response of the body, manifested by the power of the cardiovascular and respiratory systems to carry a greater amount of O_2, which in turn, can be changed by repeating the physical exercise at "about 60 - 80% of maximum heart rate", with a duration of 15 – 50 minutes (depending on the intensity of effort), with a training frequency of 3 to 5 days/week and achievable by methods such as walking, running, swimming, cycling, skating, skiing and other long-term activities.

The development of muscle strength is in a direct proportionality relationship with the musculature mass that can be improved by using the strength exercises of an isometric, isotonic and isokinetic type. The development of local muscle strength can be achieved by using small loads but with many repetitions; the use of force exercises require practice of a rhythmic breathing and a good heating of the muscle groups on which we are working on.

Getting a good physical condition by developing muscle strength, entail: maintaining in normal parameters the body weight, an increased functional capacity and the decrease of the risk of bone injuries, muscles and joints; specialists in this field show that at the muscles level the burnings are more intense; the force is the individual's ability, which over the years, loses the least of its value.

A load that causes muscle contraction at a lower intensity of about one third of its maximum power produces no effect towards growing, probably because it is insufficient to produce a deficit of O_2. A load that exceeds two thirds of maximum muscle strength, momentarily lowering the intake of O_2, causes the enlargement of capillaries, increasing their activity by about 40%.(Demeter, A., 1966)

Specialists consider that the most important risk factors are: smoking, hypertension and motor inactivity. To improve cardio-respiratory resistance, it is recommended that exercises to be done with lower heart rate intensity for a long period of time and practice with high intensity over a short period of time.

By establishing research objectives we seek to determine if:

- During the university physical education lesson can be applied a program of specific means to

determine the development of general and local strength, cardio-respiratory resistance and local resistance;

- The expression level of strength, of cardio-respiratory resistance and local resistance, measured after the program, can be mainly determined by the use of specific resources.

Research hypotheses

Our practical and methodological approach was based on the following assumptions:

- Knowing the level of manifestation of the conditional motor capacity – strength and endurance, can direct the methods and used means selections during the university physical education lesson.
- University physical education lesson, as most forms of organized sports activities, is likely to be improved by continuously analyzing its systemic components.
- Recalling our specialized domain expertise, we want to offer another point of view, in approaching the university physical education lesson.

Research procedures and methods

The research was conducted according to the teaching process of the university physical education classes in the academic year 2010 - 2011, included in the curriculum (14 hours/semester). The sample subject to research included students from year I, consisting of 50 students, the selection of these subjects was random. Initial testing (it) took place during physical education classes in October/November 2010 and final test (ft) during physical education classes in May 2011.

Research methods and techniques used are part of proper investigative methods (observation, experiment) and processing methods, analysis and interpretation of collected data (statistical-mathematical, graphical) by measuring and assessing the expression of resistance, local force regime and cardio-respiratory resistance.

Skills evaluated (Finichiu, M., 2010) were addressed to: **a.** abdominal muscle - lifting the trunk from dorsal position for 30" and raising the legs stretched from hanging, **b.** leg muscles – long jump from standing position and vertical jump from standing and squat positions; **c.** muscular arms - pull-ups at the fixed bar from hung position and **d.** cardio-respiratory resistance from a moderate tempo duration run, over the distance of 1000 m.

Research results and their interpretation

By calculating (Niculescu, M., 2002) statistical indicators (Table 1, Figure 1 and 2), based on the data collected, we can make a precise and accurate assessment of central tendency, by finding the maximum (Max) and minimum (Min) and also the values with the highest frequency, and distribution of knowledge level data collected by the objective assessment of the degree of scattering data and the arithmetic average recovery (X). They were calculated using the best indicators of dispersion: the amplitude (W), standard deviation (S) and coefficient of variation (Cv%).

Table 1. *Calculated statistical indicators*

Evaluated competences		Minimal Set	Testing	Statistical indicators						
				X	S	Cv	Med	Max	Min	W
Abdominal musculature	Lifting the trunk from dorsal position for 30" (no.rep.)	**22**	**it**	**22,08**	12,67	17,98	21	27	18	9
			ft	**24,33**	12,88	16,54	23	29	21	8
	Raising the legs stretched from hanging (no.rep.)	**5**	**it**	**5,23**	9,08	15,34	5	10	2	8
			ft	**7,44**	9,33	14,21	6	12	4	8
Inferior limbs musculature	Long jump from standing position (cm)	**220**	**it**	**209,35**	17,45	19,09	204	234	185	49
			ft	**222,04**	16,35	17,73	219	254	200	54
	Vertical jump from standing position (cm)	**30**	**it**	**27,18**	13,23	18,43	25	38	20	18
			ft	**32,11**	11,79	15,21	29	43	24	19
Superior limbs musculature	Tractions from hanging at the fixed bar (no.rep.)	**5**	**it**	**3,98**	8,67	23,44	3	9	1	8
			ft	**5,18**	9,01	19,11	4	12	3	9
Cardio – respiratory resistance	Duration run over a 1000 m distance (min.)	**4´30"**	**it**	**4,36**	7,32	21,66	4,4o	3,55	5,10	1,15
			ft	**4,19**	5,69	19,02	4,25	3,40	4,43	1,03

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

a. Abdominal musculature

By collecting data from the task „*lifting the trunk from dorsal position for 30"*„ which determined the expression of resistance level under the abdominal muscle strength can make the following interpretations:

- The arithmetic mean calculated after initial testing (22,08), is approximately equal to the minimal set, but less than 2,25 no. rep., compared with the arithmetic mean value after final testing (24,33). The difference between the arithmetic mean after final testing and minimal scale is 2,33 no. of repetitions.
- The lowest recorded minimum value (18), after initial testing is less with 4 repetitions than the minimal set, and with a repetition after the final testing.
- The amplitude, standard deviation and coefficient of variation, after initial and final testing, show a collective with average homogeneity and a normal distribution of results.

By collecting data from the task *"raising the legs stretched from hanging"* that determined the resistance manifestation level in strength regime of the abdominal muscle we can make the following interpretations:

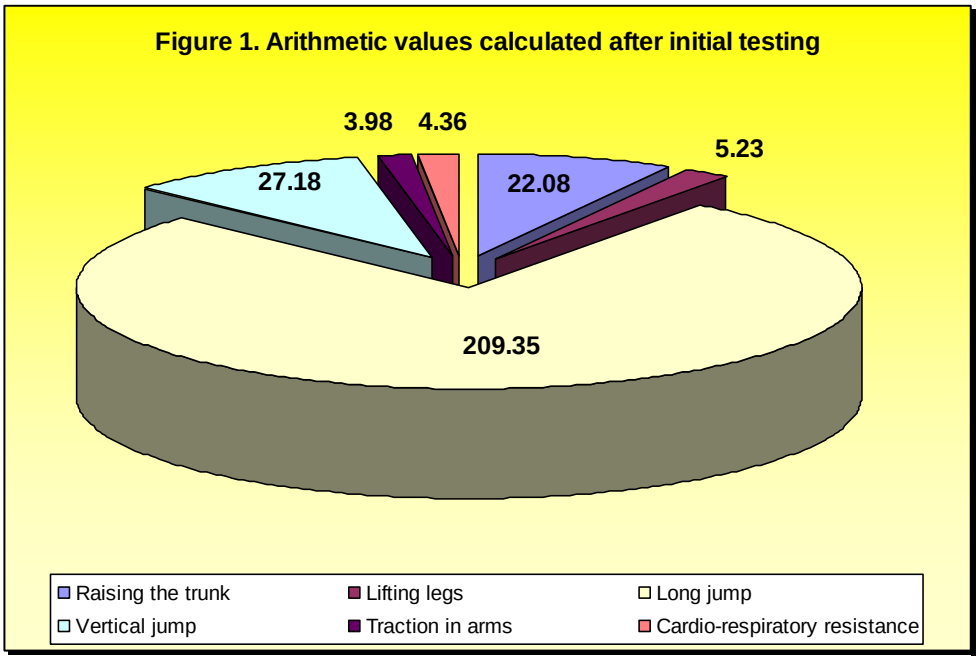
- The arithmetic mean calculated after initial testing (5,23) is higher than the minimal value set of 0,23 no. rep.; after the final testing, calculating the arithmetic mean shows the arithmetic average value of
- 7,44 no. repetitions, greater than 2,44 no. rep. from the established minimum scale and greater than the arithmetic mean value of 2,21 no. of repetitions after initial testing.
- The lowest recorded minimum value after the initial testing (2) and after the final testing (4) is lower by a total of three repetitions and 1 repetition than the minimal set (5).
- Amplitude, standard deviation and coefficient of variation, both after the initial testing and after the final testing, show a group with high homogeneity and normal distribution of results.

b. The musculature of inferior limbs

Testing the explosive force of the inferior limbs on horizontal through the task *„long jump from standing position"*, the following statistical values were calculated:

- By calculating the arithmetic means, after the two tests, we can observe the lowest value of the arithmetic mean, after the initial testing (209,35), with 10,65 cm comparative with the minimal set and 12,69 with the arithmetic mean after the final testing. The arithmetic mean calculus, after the final testing, (222,04) revealed a higher value compared with the minimal established set, the difference between these two values being of 2,35 cm.
- After initial testing, the lowest recorded minimum value (185) is 35 cm lower than the minimal set, after final testing this minimum was 200 cm by 20 cm lower than the minimal set.
- After the calculation of central tendency, after the two tests, amplitude, standard deviation and coefficient of variation show a collective average homogeneity and normal distribution of results.

Figure 1. Arithmetic values calculated after initial testing



Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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The task *"vertical jump from standing position, from squat"* that tested the explosive strength of the inferior limbs on vertical, allowed us to obtain the following statistical values:

- The arithmetic mean calculated after initial testing (27,18) is less than the minimum scale (30) for this age is less than 2,32 cm to 4,43 cm compared with the arithmetic mean value calculated after final testing (32, 11).
- The lowest recorded minimum value (20), after initial testing is less than 10 cm, than the minimal set; after final testing the lowest recorded value (24) was 6 cm less than the minimum scale.
- The amplitude, standard deviation and coefficient of variation, after the two tests, show us a collective with average homogeneity and normal distribution of results.

c. The superior limbs musculature

The task *"tractions from hanging at the fixed bar"*, through which the resistance in force regime of the scapular-humeral flexors was tested, allowed us to obtain the following statistical values:

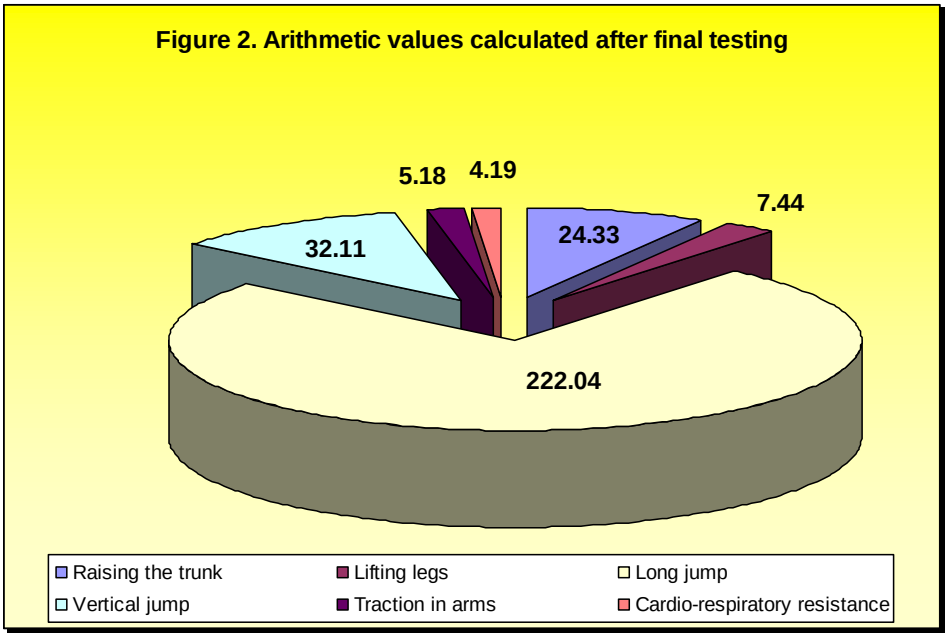
- The calculus of arithmetic mean (3,98), for the recorded values at this task after the initial testing, reveal the fact that this is lower by 1,02 no. of repetitions, compared with the minimal set (5). After final testing, the calculated arithmetic mean (5,18 no. rep.) is higher by 0,18 no. rep. compared with the minimal value set and with 1,20 no. rep. compared with the arithmetic mean value calculated after initial testing.
- The lowest recorded minimum values, Low = 1, after initial testing, and Min = 3, after final testing, are lower by a total of four repetitions, and respective 2 repetitions, than the minimal set established for this age category.
- The amplitude, standard deviation and coefficient of variation show a weak collective consistency (23,44) after the initial testing and an average homogeneity (19,11) after the final testing and a normal distribution of results.

d. Cardio-respiratory resistance

Cardio-respiratory resistance tested through the test "*duration run over a 1000 m distance*" allowed, after recording the data, to calculate the following values of statistical indicators:

- The arithmetic mean calculated after initial testing (4,36), is less than the minimal set with 0,06 minutes (4,30); after the final testing there is a clear increase in the arithmetic mean calculated at the value of 4.19 minutes higher with 0,11 minutes comparative with the established minimal set.
- The lowest recorded minimum (5,10), after initial testing, is lower by 0,40 minutes compared with the minimal set (4,30); after the final testing the lowest value recorded was 4,43 minutes less than the established minimal set with 0,13 minutes.
- The amplitude, standard deviation and coefficient of variation show a weak collective consistency, after the initial testing and a collective with average homogeneity after the final testing, there is a normal distribution of results.

Figure 2. Arithmetic values calculated after final testing



Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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Conclusions

- The calculation of statistical indicators of motor performance at the conditional level capacity - strength and power, after final testing, for the sample under investigation, presents us a significant increase of the arithmetic means motor parameters, compared to the initial testing and the established minimal set.
- The university physical education lesson is the only way to prepare for physical activity and to improve the physical condition, education of health, and a healthier lifestyle.
- Continued presence in physical education classes provides a minimum of movement and allows the knowledge and learning of the techniques and physical activities that must continue throughout life.
- Rigorously developed educational programs for health can help young students gain more knowledge, to develop attitudes and behavioral habits to promote and maintain a physically active lifestyle.
- Physical condition, through its objectives to improve conditional capacities strength and muscular resistance, can increase the ability to solve problems of daily life to prevent accidents.
- Designing and planning university physical education allows us to achieve the instructive - educational objectives of university physical education and sports subsystem, in order to achieve a functional independence throughout life.
- School is an effective tool in providing education for physical activity and self-knowledge of individual fitness conditions.
- Implementing an active lifestyle, physically, adopted at an early age, can be maintained over the entire lifetime.
- The components of physical fitness provide a continuous physical functionality as man gets older and include muscular strength, muscular resistance and flexibility.

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ASCERTAINING STUDY ON THE MANIFESTATION LEVEL OF THE ABILITY TO BALANCE AT CHILDREN OF 4-5 YEARS RURAL AREAS

FINICHIU MARIN[1]

Abstract

Purpose: This article is an accessible material, well-structured and easy to use by educators, teachers of physical education and sports, coaches in physical education classes, namely during the performance sport activities. Prepared in accordance with current modern bibliographical needs, this article aims to support the theoretical and practical-methodological knowledge in whose possession to be able to respond to social and motor orders related with the skill development, namely with the balance in children of preschool age.

Methods: Research methods used in this research are part of private methods and of those processed, analysis and interpretation of data collected by the study. Measurements and records method consisted of applying and recording the "Flamingo" and Matorin test results.

Results: Knowledge level of manifestation of the equilibrium capacity (coordination) in pre-school children in independent motor activity, by use of specific means to physical education and sport, is subject to the manifestation of motor skills, functional and psychological characteristics of each individual. Independent physical education activities will ensure the continuity of motor preparation, since at this age, by establishing a proper proportion between the individual physical condition and learning motor skills specific to physical education and sport, but also a gradual scaling of the physical exercise.

Conclusions: Programming the physical education and sports activities shall be in conformity with the geographical environment, the material conditions of the school curriculum and with the analytical curriculum of the field. At the preparation and organization of physical education classes and sports, should be taken into account the number of children, the ratio number of girls and boys, health, level of physical development, psychological differences, the place that the physical education and sport occupies at the group's daily schedule, the conditions in which it is carried on (in room or outdoor), the provision of school material, etc.. The use of the most efficient means and methods specific to physical education and sports can provide an improvement in health, harmonious physical development, an individual optimal physical condition, along with training and development of mental skills necessary to integrate

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Received 05.05.2012 / Accepted 11.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

children into society.

Key words: equilibrium capacity, children, rural area.

Introduction and research objectives

Physical exercises contribute to the functional and morphological development of the body, positively influence the development of musculoskeletal system, internal organs and central nervous system. They promote the development and improvement of motor qualities, intellectual skills. Through physical exercise, children get to know motor opportunities, which enrich and make clear their conscious activity. Some children are shy, dreamy, reserved, feel insecure and fearful than others. Fitness routine based on activities as close to their age and capabilities is a remedy at hand to help them gain confidence in themselves (Finichiu, M., 2008).

In young children, an essential role is held by the physical exercises and movement games that, in time, lead to the formation of qualities such as agility, flexibility, speed, spontaneity, skill etc. (Prescorniță, A., 2004). Whereas, game movement contributes to the development of psychic abilities, especially thinking, language, memory, will - and in that is a reflection of reality, its transposition and transformation on an imaginary plan, it has an important role in the formation and development of human personality.

The main objective of the dynamic balance developing (coordination) is to help develop human capacity to carry out the motor acts and actions with a higher degree of coordination in terms of efficiency and with a minimum energy and nervous consumption. The teachable equilibrium capacity within certain limits will act to reduce risks of accidents during executions and a precise role in the development of high performance capacity.

Research objectives aimed at: the provision of the theoretical and practical database to understand the subjects approach during the physical education lesson;

- understanding the application capacity, programming and interpret the aspects of the balance capacity development;
- gathering up to date information with regard to the approach of this psychomotor ability – balance;
- The acquisition of new motor acts and actions to increase the motor baggage and their application in appropriate cases thus improving coordination capacity value.

The ability to balance (coordination) educated within certain limits will act to reduce risks of accidents during executions and a precise role in the motor capacity development to achieve high physical performance. Having a particularly rich content of components, it plays a key role in the harmonious physical development and therefore in achieving the training and competition goals. The question is:

The ability to balance (coordination) is more developed in girls than in boys? Or the differences obtained are influenced by the planning and programming made by specialists? To what extent the balance capacity share (coordination) influences the results of the top individual sports? But in the collective ones? Benchmarks from the primary cycle, aim at the acquisition of children of the capacity to carry out motor activities with high index of speed (promptly and adequately responding to visual signals, auditory and tactile) implementing progressive motor tasks with high degrees of complexity; of handling the body segments (running, jumping, creeping, balancing, climbing, carrying loads) by force of their muscles, to submit and support the efforts easily extended uniform and variable of extended duration. These objectives help develop children's motor skills (speed, coordination skills, strength and resilience) that are essential components in daily activities and in the adaptation and environmental mastery. Our theoretical and methodological intervention objectives were:

testing a large number of children in order to accumulate a factual material as rich as possible;

processing data collected depending on the statistical and mathematical methods, which to make the base of an objective interpretation;

develop conclusions drawn from the survey and highlight the relationship between study content and practical activity content.

Research hypotheses

The conducted research was based on the following assumptions:

1. Choosing the methods and means used in the physical education and sport activities can be determined by the level of manifestation of the equilibrium capacity (coordination) of children.

2. The methods and means contained in the physical education curriculum can be continuously improved and adjusted to the new demands of current reality.

3. Carrying out the objectives and strategy content and the assessment of motor parameters, functional and somatic contributes to the quality and efficiency of the training process.

Research procedures and methods

The research was conducted according to the teaching process of physical education and sports classes for children from middle group (4-5 years) of kindergarten in the village Drajna, village Ogretin, Prahova County, from September to November, the school year 2011 to 2012. In the collection of significant data, we found it necessary to establish a representative sample consisting of 20 subjects (11 girls and 9 boys), the selection of these subjects was random and sought to include an equal number of boys and girls.

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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Measurements and records method consisted of the application and reporting of results to the following tests:

- *The Bass Test* (Epuran, M., 2005) consists of performing 10 jumps performed on marked spaces (11 spaces marked, size 2.54 cm x 2 cm) with chalk or tape on the ground or floor ; starting position: from sitting to his right foot on the shaded area, goes by jumping and lands on the left foot in the other marked area, in which he maintains the equilibrium position for 5", followed by a series of lift offs and landings when on a leg and the other and maintaining the balance for 5" until the end of the track. The sole of the foot must cover completely the mark so that this is no visible. A good score consists in covering each marker with the sole without touching the ground/floor with the heel or other part of the body and maintain static position for 5 seconds. 5 points are given for each correct landing and coverage of the mark and one point for every second is added while maintaining the static equilibrium. The subject can get a maximum of 10 points for each marker or a total of 100 points for the entire track. Each of the 5 seconds of trying to keep the equilibrium will be counted aloud, with one point given for each second or with the registration of the points for each marker. The subject is allowed to re-balance, trying to maintain the equilibrium for 5 seconds, after he landed properly.
- *The„Flamingo" Test*

(http://www.topendsports.com) consists of maintaining a steady position for 1 minute in a position of standing on one leg, barefoot or with socks, on a strip (5 cm high and 3 cm wide), with the other leg bent knee and grasping the ankle; arm is raised ahead, bent from the elbow, leaning upon the examiner's arm and has the role maintain balance; the test begins when the arm has broken the contact with the examiner; time is measured as the balance is kept, that is the time in which he does not drop the bent leg and no part of the body does not come into contact with the ground; if the hand escapes the ankle it supports or if one side of the body contacts the soil, the test is repeated. The effective time of maintaining the equilibrium is recorded.

- *The Matorin Test* (Epuran, M., 2005) consists of making a return jump around the longitudinal axis of the body, towards left or right. The values of each type and the amount of the two rotations are recorded. The measurement is performed using a compass in sexagesimal degrees. Matorin equaled performance over 360° with the mark "very good".

Research results and their interpretation

By processing the collected data (Table 1) and calculating the statistical indicators we have the possibility to accurate assess the central tendency, the knowledge of the maximum (Max) and minimum (Min) values and the highest frequency, but also the distribution level of the collected data by the objective assessment of the degree of data scattering and the arithmetic average recovery (X). We have calculated the most commonly used indicators of dispersion: the amplitude (W), standard deviation (S) and coefficient of variation (Cv%).

1. Based on the collected data by applying the ***Matorin Test***, which tested the equilibrium capacity, of coordination of each individual by performing a jump with rotation around the longitudinal axis, we noticed

The value of the calculated arithmetic mean (figure 1) for the girls sample ($75,45^0$, figure 2) is lower than the one calculated at the boys sample ($112,22^0$, figure 3), with $36,77^0$; taking into account the level of physical and mental development, this difference between the arithmetic means of the two sample that were tested for the equilibrium capacity, the coordination one based on a jump rotation around the longitudinal axis, is much too high.

❖ The amplitude and standard deviation presents us a normal distribution of the results from the data range.

❖ The coefficient of variability shows us that the recorded results from the girls sample present a low homogeneity (25,39%), the boys sample recording a medium homogeneity (10,70%) for this task.

Table 1. *Calculated statistical indicators*

	Statistical indicators	Matorin Test (degrees)	Flamingo Test (seconds)	Bass Test (points)
Girls	**X**	**75,45**	**24,09**	**20**
	Median	70	25	20
	Maximum	100	35	50
	Minimum	50	15	0
	W	50	20	50
	S	19,16	6,25	15,49
	Cv%	25,39	25,95	77,45
Boys	**X**	**112,22**	**42,22**	**52,22**
	Median	110	45	50

	Maximum	130	50	70
	Minimum	90	30	20
	W	40	20	50
	S	12,01	5,65	17,87
	Cv%	10,70	13,38	34,22

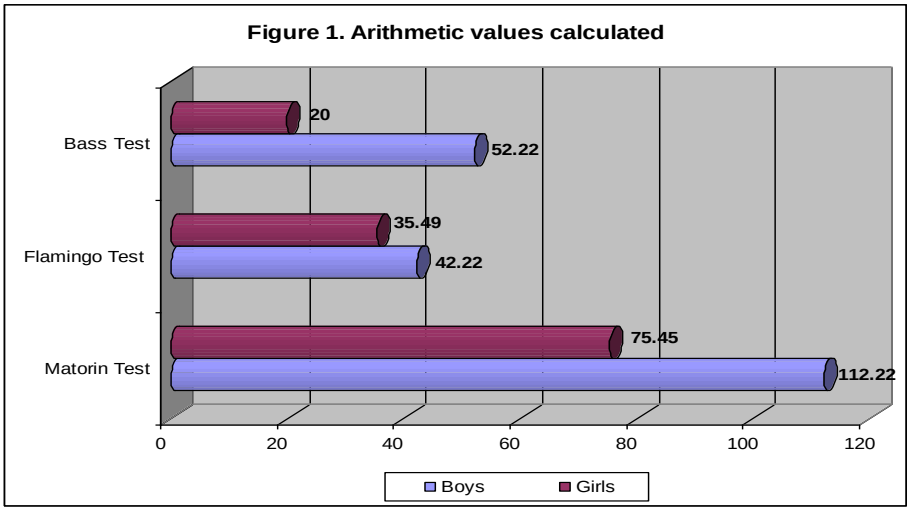
2. By applying the ***Flamingo Test*** we determined the manifestation level of the equilibrium capacity, of coordination of subjects by maintaining a balance position for 1 minute, in a position of standing on one foot, barefoot or with socks on a strip (5 cm high and 3 cm wide), with the other leg bent knee and grasping the ankle; arm is raised ahead, bent from the elbow, we noticed:

❖ The value calculated for the arithmetic mean (figure 1) at the girls sample (24,09 seconds, figure 2) is lower than the one calculated at the boys sample (42,22 seconds, figure 3), with 18,13 seconds.

❖ The amplitude and standard deviation presents us a normal distribution of the results.

❖ The coefficient of variability shows us that the recorded results from the girls sample present a low homogeneity (25,95%) and the boys sample recording a medium homogeneity (13,38%) for this task.

Figure 1. Arithmetic values calculated



3. By applying the ***Bass Test*** we determined the manifestation level of the equilibrium capacity, of coordination by making certain jumps from one foot to another on distinctive marks on the ground and maintaining the equilibrium for 5 seconds, we noticed:

❖ The calculated value for the arithmetic mean (figure 1) at the girls sample (20 points, figure 2) is lower than the one calculated for the boys sample (52,22 points, figure 3) with 32,22 points.

Figure 2. Arithmetic values calculated for the sample of girls

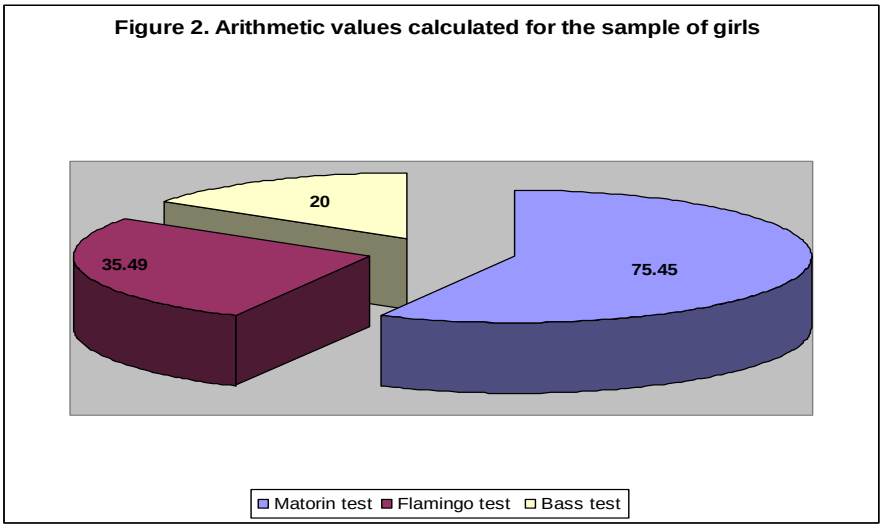
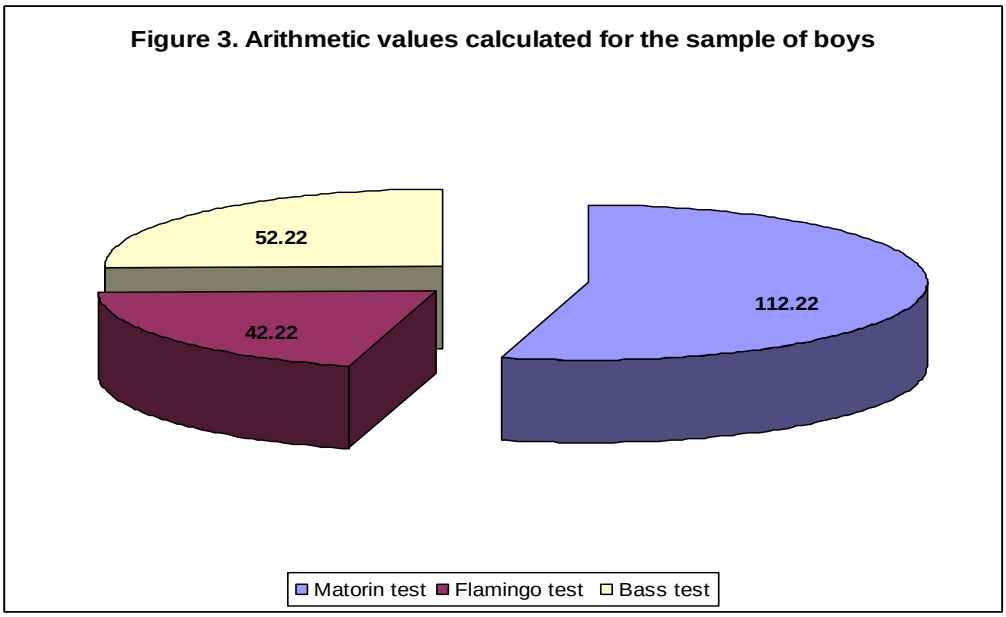


Figure 3. Arithmetic values calculated for the sample of boys

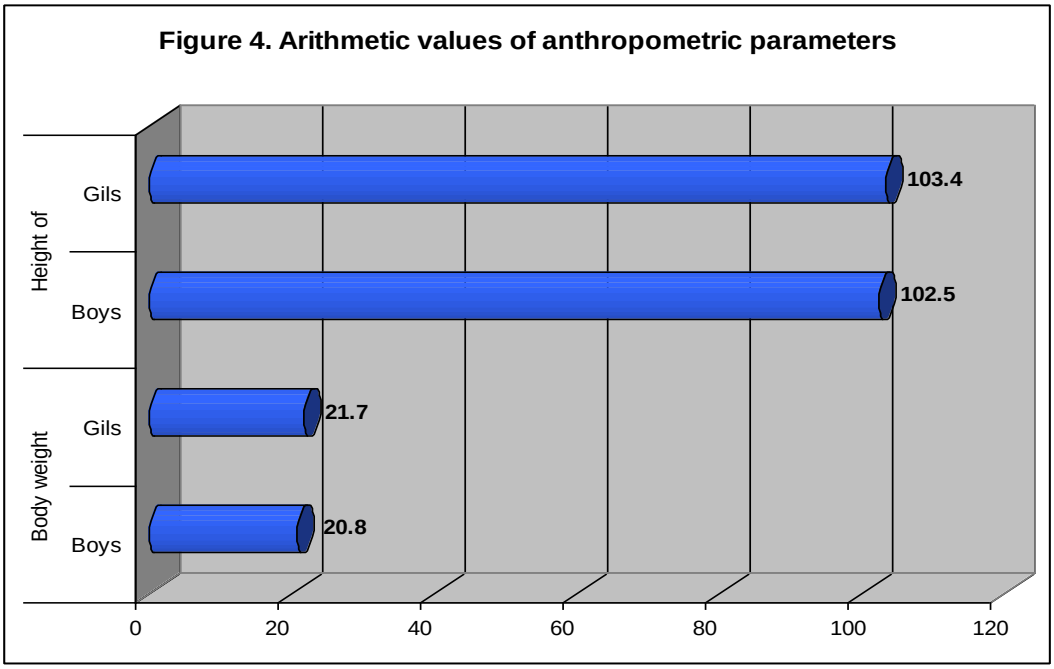


- The amplitude and standard deviation presents us a normal distribution of the results.
- The coefficient of variability presents us a girl sample with a homogeneity that indicates not to trust the average (77,45%) and a boys sample with the weak homogeneity, of the recorded results, (34,22%), for this task.

Assessing the level of growth and physical development is based on anthropometric measurements (Figure 4) made on the members of the experiment sample by introducing the values of the arithmetic means obtained in different formulas that aim at the growth and development phenomena [Dragnea, A., 1984], as follows:

❖ From a somatic development point of view, after making anthropometric measurements, the girls present arithmetic means of the two anthropometric parameters superior to the boys sample, thus fitting in the general evolution of the two sexes, for this age.

Figure 4. Arithmetic values of anthropometric parameters



Conclusions

- Respecting the age and sex characteristics during the instructive – educational process, also the specific of the geographical environment, allows the achieving the educational objectives by completing and modifying the analytical curriculum specific to the physical education and sport field.

- The contribution of physical activity is to improve health, recreation, obtaining a well-being state with the purpose to increase the school performance for a long period of time.
- The multitude of means used by the practical activity of the physical education and sport field, the large number of relationships with other related fields, require the selection and use of methods and means with the highest efficiency in the educational activity, with the purpose to achieve a physical condition optimal for that age.
- Programming the physical education and sport activity must be realized in accordance with the specific of the geographical environment, with the material conditions of the educational unit and with the analytical curriculum of the field.
- The use of the most efficient means and methods specific to physical education and sports can provide an improvement of health, a harmonious physical development, an individual optimal physical condition, along with training and development of mental skills necessary to integrate children into society.
- Getting used to practicing physical exercise can represent the first step in developing an individual motor capacity necessary to the achievement of the motor skills specific to the different sport fields, a gradual scaling if the physical effort by respecting the age and sex particularities.
- In the preparation and organization of physical education classes and sports, we should take into account the number of children, the ratio number of girls and boys, health state, the level of physical development, psychological differences, the place that physical education and sports occupies in the group's daily schedule, the conditions in which the activity is carried out (indoor or outdoor), the provision of school material, etc.
- Ascertaining the study confirms the research hypothesis and the need to educate the equilibrium capacity, of coordination in comparison with the level of manifestation of the individual motor qualities.
- Using a relatively small number of domain-specific means, but simple and long practiced, contributes to the increase of the individual physical condition manifestation level, confirming the research hypothesis.
- Educating the children to practice continuous and systematic physical exercises and to participate in various sport activities depending on everyone's skills.
- The difference between the arithmetic means calculated for both samples, girls and boys, which has tested the ability of balance, coordination based on the three tests is high.
- After the anthropometric measurements, the arithmetic means calculated for the sample of girls are superior to the sample of boys, being thus in the national development of both sexes for this age.

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

DANCE ATTITUDE DIFFERENCES BETWEEN FEMALE AND MALE STUDENTS

JADRANKA VLAŠIĆ[1], GORAN OREB[1], DARKO KATOVIĆ[1]

ABSTRACT

Dance is often stereotypically categorized as "women's" sports' activity and as such, dance is not a favorite sports' activity among men. In regards to various transformational, educational and nurturing benefits that dance enables, the dance attitude of students of the Faculty of Kinesiology was assesed. Questionnaire showed positive, although different dance attitudes among genders. Dance course had greater influence in attitude change on male students. Positive dance attitude is a good prerequisite for dance activities' engagement, especially that of male individuals.

Key words: female and male students, dance, attitudes.

Introduction

Dance is a conventional aesthetic activity that many authors consider to be a combination of sports and art (M. Zagorc, 2000, S. Bijelić, 2006). As a kinesiological operator, dance is efficient from the aspect of transformational, educational and nurturing effects (G. Oreb, 1992; X.X. Li & Y. Yoa, 2005). Traditional beliefs and prejudices (D. Brennan, 1996; M. Björling, 2007) towards dance are causing minimal dance application in physical education classes and also minimal dance selection as a sports or recreational activity, especially considering male individuals.

Stereotypical "men's" and "women's" sports (Oglesby and Hill, 1993, according to K. Bosnar, H. Sertić, F. Prot, 1999) have following characteristics:

Traditional "men's" sport	***"Women's" sport***
Specialized, intensive	In balance with other life aspects, diffuse energy is being invested
Exclusive, elite	"for every girl"
Directed towards profit/win, spectacular for audience	Didactical, serves to development, private
Serious, rules' limited	Natural, spontaneous, fun
Risky, advantureous	Safe, health-friendly
Aggresive, directed on dominance over the opponent	Friendly, cooperative
Coaches and staff are males	Coaches and staff are females

According to description above, dance belongs to the cathegory of "stereotypical" women's sports and that is one of the reasons for decreased application of dance contents into the physical education classes and for decreased men's dance involvement. Stereotypes slow down sports development, and dance as well; therefore youth and young people need to be raised unfettered by gender limitations. In order to accomplish that goal, PE classes are ideal tool where PE teachers, as students' role models, can influence on positive attitudes formation towards all sports in both female and male students.

Attitude is being defined as an inherited, relatively permanent and stabile organization of emotions, valorizations and reactions towards certain object (B. Petz, 1992).

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Received 07.05.2012 / Accepted 07.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

Attitude is permanent valorization of people, objects and ideas (G. Aranson, T.D. Wilson, R.M. Akart, 2005). All attitudes have emotional, cognitive and behavioral component and can be more based upon one over the other component. Once formed attitudes can hardly be altered as long as there is a functional and motivational basis upon which attitude formation was established on. However, there are ways or methods that can be used to change the attitude, one of them being persuasion. Persuasion consists of messages created with the goal of inducing changes in attitudes and behaviors of an individual receiving those messages. Important roles in persuasion have individuals who persuade, messages themselves, messaging tools and audience (according to M. Zvonarević, 1981). Attitudes define behavior; an individual behaves in accordance to his behavior, but also changes attitudes with behaviors. This can, among others, depend on the specific situation an individual is in. Individual's behavior imposed by situational factors that is not in accordance with his own attitudes may influence on the alteration of the previous attitude. This supports the fact that application of dance structures in PE classes and experiencing pleasant emotions that dance enables is beneficial to eventual negative dance attitude change in students.

Positive attitude towards certain activity still does not imply that an individual will engage in that activity. When it comes to an activity such as sports, it is to be assumed that an individual with negative attitude towards it will unlikely take part in it. Therefore, to incite involvement in such activities attitude questioning and promotion aiming to change attitude positively takes place. While having generally positive attitude towards sports, it is possible to expect negative attitude towards, for example, dangerous sports such as the martial arts, as well as sports where the aesthetic component is prevailing (K. Bosnar, H. Sertić, F. Prot, 1996).

Previously mentioned reasons have inspired the authors to assess the dance attitudes of male and female students of the Faculty of Kinesiology, the ones to become PE teachers, coaches and sports employees, who will throughout their functions in sports become certain role models, especially for youth. It is assumed that with their positive dance attitudes and promotion of dance contents, they will have influence on positive dance attitudes of individuals they will work with, regardless whether it comes to PE classes, sports or recreation.

The purpose of this research study was to determine the differences in dance attitudes between male and female students and also to determine alterations in dance attitudes influenced by Dance course classes.

Research methods and procedures

The participants in this study were 80 female and 85 male students of the third year at the Faculty of Kinesiology, University of Zagreb. The average age of participants was between 21-23 years old. The basic requirement in defining this sample of participants was completed class program from Dance course.

Students' dance attitudes were assessed using dance attitude scale SPP (J. Vlašić, K. Bosnar, 2007). The scale consists of 20 items of both directions (positive and negative) with answers containing five grades: "completely agree", "mostly agree", "not sure", "mostly do not agree", and "do not agree at all". The answers are valorized using points from 1 to 5 in such way that the greater result indicates positive dance attitude. The overall, summarized result ranges from 20 to 100 points. Dance attitude assessment was conducted at the beginning and at the end of the Dance course educational process.

The results were analyzed using Statistica 7 programs. Descriptive parameters were obtained for every individual variable of interest; mean (M), minimal value (Min), maximal value (Max), and standard deviation (SD). The normality of results' distribution was tested using Kolmogorov-Smirnov test (K-S).

To determine statistically significant differences in dance attitudes between male and female students, as well as to determine statistically significant differences in dance attitudes on the overall sample of participants in both measurements, T-test for dependant samples was used. Parameters obtained included: mean (M), standard deviation (SD), t-test value (t), and alpha level (p).

Results

Table 1. Descriptive parameters of the first and the second dance attitude measurement in female students (SPP).

FM	N	Min	Max	Range	M	SD	Kurt	Skew
1SPP	80	52	100	48	78.32	10.84	-0.21	-0.35
2SPP	80	37	99	62	81.71	9.83	4.04	-1.06

FM- female students; N-sample size; Min-minimum; Max-maksimum; M-mean value; SD-standard deviation; Kurt-kurtosis; Skew-skewness (coefficients of variability).

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
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Descriptive parameters of variables for dance attitude assessment in female students (Table 1) confirm the increasement of the average points in the first measurement test by 3.39 points in the second measurement, which indicates the increasement by 3.39 in positive direction. Based on that notion, female students had a positive dance attitude which even got better under the influence of Dance course classes. Distribution of participants' results in both measurements was mildly asymmetrical, indicating female participants' results to have been of somewhat higher values.

Table 2. Descriptive parameters of the first and the second dance attitude measurement in male students (SPP)

MS	N	Min	Max	Range	M	SD	Kurt	Skew
1SPP	85	30	92	62	66.12	12.55	0.21	-0.62
2SPP	85	29	92	63	71.05	14.07	0.92	-0.99

MS- male students; N-sample size; Min-minimum; Max-maksimum; M-mean value; SD-standard deviation; Kurt-kurtosis; Skew-skewness (coefficients of variability).

Descriptive parameters of variables for dance attitude assessment in male students (Table 2) show the increasement of the average points in the first measurement test by 4.93 points in the second measurement, which indicates the increasement by almost 5 points in positive direction although the dance attitude of male students was positive. Distribution of participants' results in both measurements was mildly negatively asymmetrical, indicating male participants' results to have been clustered at somewhat higher values. This indicated that the sample was heterogenous.

Table 3. Descriptive parameters of the first and the second dance attitude measurement in all students.

S	N	Min	Max	Range	M	SD	Kurt	Skew	Max D	p
1SPP	165	30	100	70	72.04	13.22	0.27	-0.51	0.07	0.25
2SPP	165	29	99	70	76.21	13.28	1.19	-1.15	0.02	0.25

S-all students N-sample size; Min-minimum; Max-maksimum; M-mean value; SD-standard deviation; Kurt-kurtosis; Skew-skewness (coefficients of variability). Max D- deviation of the relative cumulative empirical frequency from the relative theoretical frequency; p-alpha level of K-S test.

Descriptive parameters' values from Table 3. show the increasement of the average points from the first measurement test by 4.17 points, which indicates the increasement by 4.17 points in positive direction although the dance attitude of all students was positive. Distributions of both assessment results were mildly negatively asymmetrical and flattened. This, in other words, indicated greater quantity of results in the area of somewhat higher values demonstrating that the sample was heterogenous. Kolmogorov-Smirnov test results showed that results' distributions were not statistically different than the normal distribution.

Table 4. T-test results of the first and the second dance attitude measurement in the overall sample, in male and female students

	S				FS				MS			
	M	**SD**	**t**	**p**	**M**	**SD**	**t**	**p**	**M**	**SD**	**t**	**p**
1SPP-2SPP	-4.17	15.63	-3.43	0.01	-3.39	13.64	-2.22	0.02	-4.92	17.35	-2.61	0.01

S-all student; FS- female students; MS-male students; M-mean value; SD-standard deviation; t-t-test value; p-alpha level

T-test (with alpha level of 0.01) showed statistically significant differences in dance attitudes in the overall participants' sample. Statistically significant differences in dance attitudes were also found between the first and the second measurement in male students, whereas for female students, statistically significant difference in dance attitudes between the first and the second measurement was found at the alpha level of 0.05. Conclusively, the group of students whose dance attitudes were significantly changed from one measurement to another had somewhat greater contribution to the statistically significant difference in dance attitude of the overall sample.

Discussion

Descriptive parameters of variables for dance attitude assessment confirm the increasement of the average number of points from the first measurement test in female students (Table 1) by 3.39 points, whereas this increasement for male students was by 4.93 points. In other words, the average number of points from the first measurement test increased by 3.39, that is, by 4.43 points in the positive direction. Based on this, it is evident that the positive dance attitude of female and male students has changed for the better under the influence of the Dance course classes. The increasement of positive dance attitude in male students compared to female students is indicative of the fact that male students were less familiar with and were less involved in dance activities. In that way, male students were more exposed to the negative dance attitudes and stereotypes on dancing. However, the fact that Dance course class influenced the positive changes is promising and encouraging for all dance instructors and dance enthusiasts.

Descriptive parameters' results of dance attitude of all students (Table 3) show that the average number of points from the first measurement test increased by 4.17 points, meaning this increasement was by 4.17 points in the positive direction at the second measurement test, although the dance attitude of all students should be defined as a positive one. The results' distributions of both dance attitude measurements show the greater quantity of results to be in higher values' area and also show that the participants' sample was heterogenous. Kolmogorov-Smirnov test results confirm that results' distributions were not statistically different from normal distribution.

The differences in dance attitudes in the first and the second attitude assessment of male and female students, which means before and after Dance course educational process, and the differences in dance attitudes between the first and the second assessment of all students were analyzed using T-Test for dependant samples.

T-test (p=0.01) showed statistically significant differences (Table 4) in dance attitudes in the overall sample and in dance attitudes of the students in the first assessment compared to the students in the second assessment. Female students showed statistically significant differences in dance attitudes at the alpha level of 0.05. The group of students whose dance attitudes were significantly changed from the first to the second measurement contributed somewhat more to the found statistically significant difference in dance attitudes. The cause for this result may be attributed to Dance course classes. This could be supported by the fact that statistically significant difference was found in the results of male students, and especially having on mind scientifically established fact that dance belongs to stereotypical "women's" sports' activity (Oglesby, Hill, 1993, according to K. Bosnar, H. Sertić, F. Prot, 1999).

Many research studies have confirmed that dance as sports' activity is chosen by women (F. Prot, K. Bosnar, 2000; F. Prot, K. Bosnar, G. Sporiš, 2006), whereas men discard dance as a sports' activity. This reasearch study established students' positive dance attitude. Such result is extremly valuable since the SPP questionnaire relates primarily to the attitude towards ethnic/folk and social dances that students are generally not well familiar with. It is especially important to highlight the prejudices and negative attitudes towards ethnic dances. These are mostly based on the lack of information on their values for which the educational system is partly responsible by not giving enough tributes to the tradition and nation's own culture. Positive influence of Dance course classes on dance attitudes in students needs to be valued from the aspect of the fact that PE teachers are the biggest authorities for sport that chidren and youth encounter, and therefore it is reasonable to expect that PE teachers will have significant influence on molding their attitudes towards sports (F. Prot, K. Bosnar, 2000), dance included. Due to this reason, it is clear that students, future PE teachers will influence with their positive attitudes on the positive attitudes of their students, that is, on the change of the stereotypes in their students. Additionally, the changeability of stereotypes' influence that is more pronounced in sports that individuals reject compared to sports that are accepted, needs to be accentuated. The positive influence of performing certain activity on the attitude towards that activity was confirmed in dancers themselves. Dancers' attitudes towards their own dance form are more positive than towards other dance forms, in some dancers (ethnic

and modern dance) this was also partly due to the time period they spent engaged in certain dance technique (P. Nieminen, Varstala, 1999). All previously mentioned implies that students' positive dance attitude was changed to an even better attitude by dance contents application. This research project hypothesized on positive influence of dance classes, that is, dance contents and/or experience, on dance attitude, which was proven as well as the hypothesis on different dance attitudes in male and female students.

Conclusions

This research study confirmed the positive influence of Dance course classes on dance attitude positive change in students of the Faculty of Kinesiology, University of Zagreb which implies that increased application of dance structures are needed in PE classes, sports and recreation. More intensive application of dance structures during mandatory education (PE classes), as well as during sports training and recreation, would most likely contribute to the dance attitude change as a stereotypical "women's" activity, and with that would also influence on dance popularity among male population. Statistically significant differences in dance attitude between female and male students and greater influence of Dance course classes on dance attitude change in male students agree with the above mentioned.

These research results are concrete contribution to PE teachers and dance pedagogues in regards to dance structures' application with the goal of enhancing the overall status of school-aged children and youth, as well as their contribution to the nurturing component of the PE classes.

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

A COMPARATIVE STUDY REGARDING THE IMPACT OF PHYSICAL EXERCISES OVER THE SOMATIC INDICATORS FOR CHILDREN LIVING IN URBAN AND RURAL AREAS (10-11 YEARS)

LUPU ELENA[1]

Problem Statement: Once a child starts its school experience, the learning process is triggered, as it is considered that it has to develop on the basis of a healthy organism, due to the fact that the intellectual effort requires a greater physical resistance. Furthermore, knowing children's anatomic and physiologic particularities is a necessary condition for a good proceeding of the Physical Education lesson in school, because it enables the members of the didactic staff to understand the importance of physical education for primary school pupils, and the necessity of these lessons to be realised in an organised and systematic manner. Somatic parameters are a barometer for the didactic staff, and a comparative presentation of these parameters could represent a starting signal for the didactic process.

Purpose of Study: This research started from the hypothesis according to which there are significant differences in the somatic development of children in urban areas, as compared to those living in rural areas, and we believe that these differences occurred due to the lack of movement. The present research was undertaken on a group of 20 subjects: 10 subjects living and learning in urban areas, and other 10 in rural areas.

Research Methods: For our research we used the bibliographic study method, observation method, enquiry method (discussion, conversation, Lexical association – La, etc.), pedagogical experiment method, statistical-mathematical method, and graphical method.

Findings: The purpose of this research was to observe if significant differences occur in the somatic development for children from urban areas, which have only two Physical Education lessons are more sedentary, as compared with children from rural areas, who, in addition to the two lessons of Physical Education they have in the weekly syllabus, spend about 2-3 hours a day outdoors playing ball, running or playing several specific countryside childhood games (catch, hide and seek, etc).

Conclusions: Therefore, Physical Education lesson combined with leisure activities has a positive effect on children's growth and development, an aspect which should be taken into consideration, and we should offer more outdoor time for children living and studying in urban areas.

Keywords: pupils, urban, rural, motion, sedentary lifestyle, Physical Education, somatic indices.

Introduction

Once a child starts its school experience, the learning process is triggered, as it is considered that it has to develop on the basis of a healthy organism, due to the fact that the intellectual effort requires a greater physical resistance. Furthermore, knowing children's anatomic and physiologic particularities is a necessary condition for a good proceeding of the Physical Education lesson in school, because it enables the members of the didactic staff to use correctly the means and methods and methodical processes of Physical Education, and can easily understand the reason for which some exercises are indicated while others are not, and can take measures for a rational dosage of children's effort, in accordance with their possibilities, having the purpose of making the teaching process more efficient.

Research purpose

This paper, by approaching the issues of this subject, has the following purposes:

- To identify the somatic and functional parameters;
- To identify possible somatic and functional differences which occur between the two groups of children, coming from urban and rural areas;
- To identify the causes which lead to the occurrence of somatic and functional differences between the two groups of subjects.

Research objectives

The objectives which laid the bases of this study are the following:

1. The analysis of the cases in which somatic and functional differences appear between the two groups of subjects;
2. The evaluation of the somatic and functional differences between the two groups of subjects;
3. Acknowledging the reasons which lead to the occurrence of these somatic differences.

Research hypothesis

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Received 09.05.2012 / Accepted 06.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

This research started from the hypothesis according to which there are significant differences in the somatic development of children in urban areas, as compared to those living in rural areas, and we believe that these differences occurred due to the lack of movement.

Operational process and involved subjects

We undertook the research on a number of 20 pupils, randomly chosen and all boys, coming from rural schools (10 pupils) and urban schools (10 pupils). These schools, where the didactic process is developed, have approximately the same learning conditions, and, at least theoretically, have the same knowledge level.

Research methods and techniques

In our scientific activity, we used acknowledged research methods and techniques:
1. Bibliographic study method;
2. Observation method and enquiry method (discussion);
3. Statistical-mathematical method;
4. Graphical method.

Obtained results and their interpretation

It is important to note, before doing the analysis and interpretation of data, that in terms of physical signs we have to note weight gain and stature growth, which are relatively slow in the first two years of school, when the difference from one year to another does not exceed two kilograms – weight gain is emphasized later –, while in the last two years, when the difference of weight rises from year to year, from two to four kilograms. Thus, for the whole small schooling age weight gain range extends from 20-29 kg, for boys, and between 19-28 kg for girls.
Therefore, body weight grows 3-4 times more than other somatic indicators. "Growth is not equal, alternating from growing in height (period of growing taller) to growing in weight (period of growing fatter), which affects all body segments, but mainly the torso and limbs." (Căpraru E., Căpraru H., 2010)
After this period, the growth process becomes slower, between 113-132 cm for boys and 111-131 cm for girls. Growing in height is primarily based on the inferior limbs and has annual averages of approximately 4,5 cm for boys and 5,0 cm for girls. Without being robust, without having an impressive constitution, we might even say delicate, the small pupil has a muscular force that is continuously growing: "he is agitated and does not find his place, runs more, but instead gets tired easily. The muscular system grows up to approximately 27.5% of body weight." (Stănescu M., 2004)
Being clumsy at first when manipulating objects, especially those required in school, the pupil becomes more skilled, learning how to organise his gestures according to the context.
All these aspects described above have been observed and noted by the following authors: Stănescu M. (2002, 2004), Ifrim M. (1986), Căpraru E., Căpraru H. (2010), in books such as: *Physical Education for Preschool Children and Pupils*, and *The Didactic of Physical Education* (Stănescu M); *Motric Anthropology* (Ifrim M.); *Mother and Child* (Căpraru E., Căpraru H.).
For this reason, we believe that, through an early identification of the phenomena affecting the human body, enabling it to develop and transform, we can help the members of the didactic staff to understand the importance of physical education for primary school pupils, and the necessity of this lessons to be realised in an organised and systematic manner, due to the fact that somatic parameters are a barometer for trainers, and a comparative presentation of these parameters could represent a starting signal for the didactic process.

The present research was undertaken in two phases:
- Phase 1 or phase of somatic-metrical indices measurement – height and weight
- Phase 2 or enquiry phase.

Phase 1 – in this phase we measured and weighed pupils from the two groups, and we have recorded the final data in tables.
In order to improve the teaching system, and to increase the efficiency of the teaching process by opening new research directions for field specialists, we undertook the study below, in accordance with data from Tables No. 1, 2, and Graph No. 1.

Statistic indicators recorded for 4th grade pupils, aged 10-11 years, from rural areas

Table No. 1

No.	Name and Surname	Age - years -	Height - cm -	Weight - kg -
1.	E.A	10	124	22,5
2.	G.F.	10	125	34,7

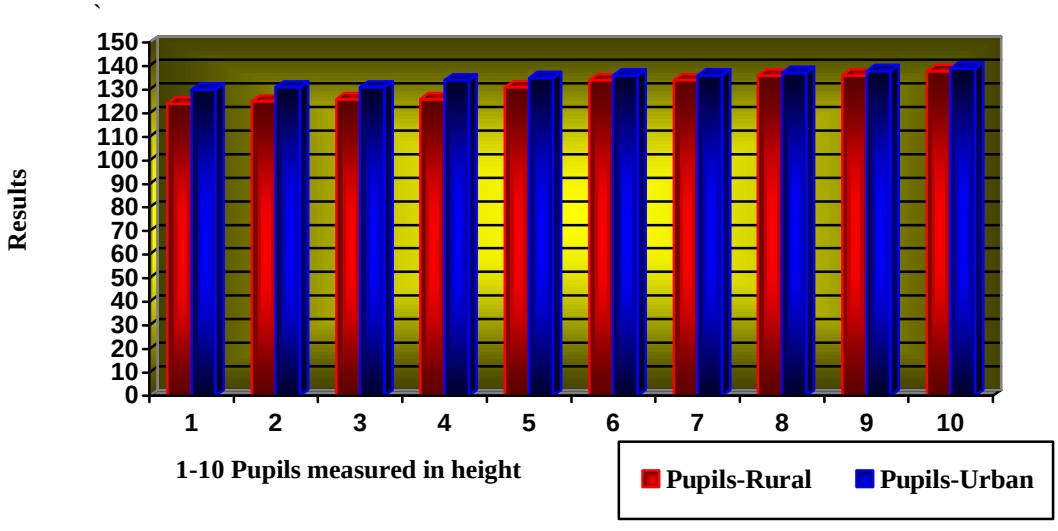
3.	T.N	10	126	29,2
4.	Z.F.	10	126	30,5
5.	I.H.	10	131	27,5
6.	Ş.I.	10	134	29,7
7.	O.R.	10	134	30,2
8.	W.S.	10	136	28,4
9.	V.L.	11	136	33,4
10.	L.M.	11	138	33,3
X	Average	10,2	131	29.94

Statistic indicators recorded for 4th grade pupils, aged 10-11 years, from urban areas

Table No. 1

No.	Name and Surname	Age - years -	Height - cm -	Weight - kg -
1.	N.G.	10	130	28,8
2.	E. L	10	131	32,0
3.	C.B.	10	131	32,5
4.	P.C.	10	134	36,5
5.	B.Z.	10	135	30,7
6.	N.I.	10	136	30,5
7.	T.A.	10	136	38,5
8.	Z.P.	11	137	34,6
9.	I.I.	10	138	30,8
10.	T.V.	11	139	29,8
X	Average	10,2	134	32.47

Graph No. 1 Representation of statistic height indicators in centimeters for pupils in rural and urban areas



Graph No. 2 Representative graph regarding height (cm) and weight (kg) average, presented in comparison for the two groups of pupils - urban and rural areas

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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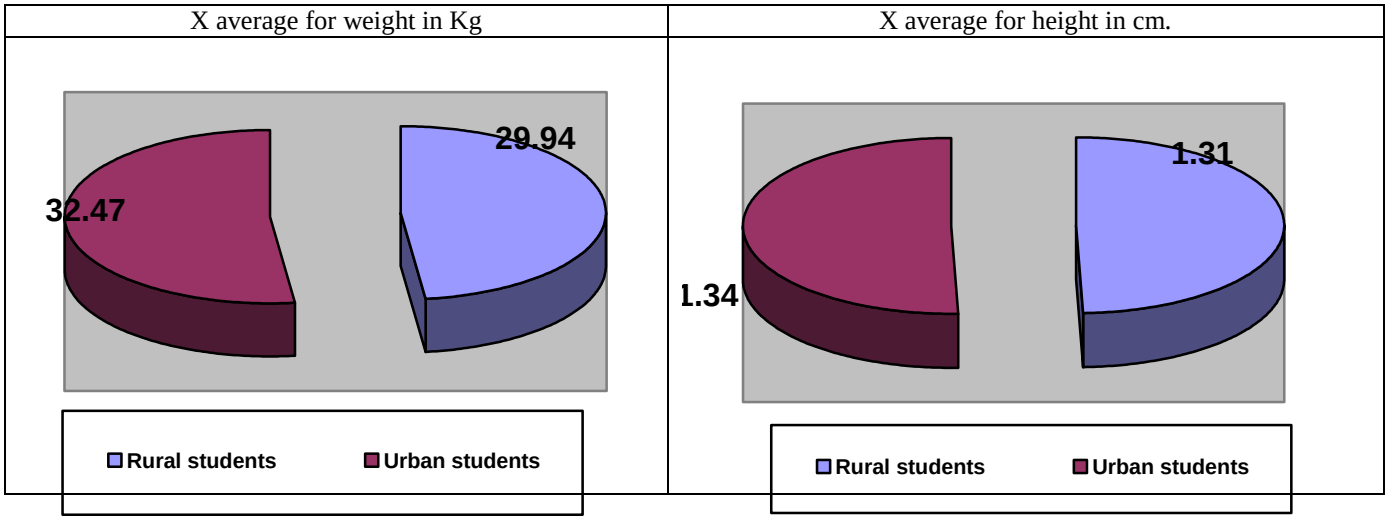

Phase 2 – is the enquiry phase both for the entire group and individually. As a consequence of the undertaken research, we observed that there are significant differences for the two groups for leisure activities (see Tables No. 3 and 4).

Statistic indicators recorded after the enquiry for pupils – rural areas

Table No. 3

Question for the enquired group	Answers %	
1. How many lessons of Physical Education do you have weekly?	2 lessons	100%
2. Do you play outdoors after school?	Yes - 90/%	No - 10%
3. How many hours do you spend playing outdoors?	3-4 hours	90%
3. Which are your favourite games? Please enumerate.	Catch, hide and seek, football, volley - 90%	No answer - 10%
4. If you do not play outdoors, which other activities do you prefer?	TV, PC games	10%

Statistic indicators recorded after the enquiry for pupils – urban areas

Table No. 4

Question for the enquired group	Answers %	
1. How many lessons of Physical Education do you have weekly?	2 lessons	100%
2. Do you play outdoors after school?	Yes - 20/%	No - 80%
3. How many hours do you spend playing outdoors?	1-2 hours/ 20%	I play outdoors only on Saturdays and Sundays 80%
3. Which are your favourite games? Please enumerate.	Badminton, football 20%	No answer 80%
4. If you do not play outdoors, which other activities do you prefer?	TV, PC games	80%

The statistical indicators, registered after our investigation for pupils who live and learn in urban and rural areas, proved that urban subjects, besides the two Physical Education lessons, spend little time outdoors, in the park or playing (1-2 hours on weekends, and the rest of their spare time is spent in front of the TV, or computer – 80% of pupils), as compared with subjects from rural areas, who spend 90% – about 3-4 hours daily after their school program - outdoors playing

different games (catch, hide and seek), sports such as football or volleyball, and completing their chores.

If we observe the recorded indicator from Tables No 1 and 2, we notice that pupils from rural areas are smaller and thinner (have recorded X= height 1.31 m and weight 29.94 kg), as compared to those from urban areas who have X= 1.34 m height and 32.47 kg). Therefore, they are either skinny and tall, or small and fat. Thus, the absence of motion after school led to negative modification of height and weight indices, confirming the hypothesis according to which there are significant differences in the somatic development of children in urban areas, as compared to those living in rural areas, and we believe that these differences occurred due to the lack of movement.

Conclusions

- Somatic parameters are a barometer for trainers and their future activities, and a comparative presentation of these parameters could represent a starting signal for the didactic process, because it is widely known that any delay for a child's somatic development is an alarm signal for other activities which may disturb his/her learning capacity.
- Between the somatic indicators of urban subjects and rural subjects there are major differences, which we believe that occurred due to the sedentary life characterising children living in big cities.
- The absence of motion after school led to negative modification of height and weight indices, thus confirming the hypothesis according to which there are significant differences in the somatic development of children in urban areas, as compared to those living in rural areas, and we believe that these differences occurred due to the lack of movement.
- Physical Education lesson, combined with leisure activities, has a positive effect on children's growth and development, an aspect which should be taken into consideration, and we should offer more outdoor time for children living and studying in urban areas.
- This present study completes other previous researches in this field, and the scientific approach of the mentioned subject opens new perspectives for field specialists.

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STUDENTS/PUPILS COMMUNICATION ACTS AS A NEW WAY OF RESPONDING TO THE PROFESSOR'S TYPES OF COMMUNICATION IN UNIVERSITIES AND HIGH SCHOOLS

OPREA VIOREL[1]

Abstract

Problem Statement: The present research aims to bring to the forth a long debated issue, less approached in practice, regarding the distribution of behavioural acts of pupils and students, which could represent a new manner of instruction and a new answer to the professors' types of communication.

Purpose of Study: This research has been undertaken within Physical Education and Sport lessons, on a group of 434 students from the Petroleum-Gas University of Ploiesti, and on a group of 412 pupils from the high schools of Ploieşti (206 pupils from "Toma N. Socolescu" from Ploieşti, and 206 pupils from the Industrial 1Mai Group, Ploieşti).

Research Methods and techniques. The research methods and techniques used to address the purpose and research objectives are: bibliographical method; observation method; statistical-mathematical method; graphical method; experimental method.

Findings: This paper started from the hypothesis according to which, if within operational projects (and here we refer to the didactic scenario), we anticipate and prepare messages, and then the receptive capacity of pupils/students will increase significantly, as well as the instructive efficiency.

Conclusions: The pupil/student must have initiative and take responsibility, value the experience in the learning process. The pupil /the student are the one to respond to the teacher's requests and have to enter into the flow and interaction-oriented action, knowledge, creation. The pupil/student must have initiative and take responsibility, value the experience in the learning process.

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Email: vopreaefs@yahoo.com
Received 09.05.2012 / Accepted 06.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

Keywords: pupils, students, professors, physical education, types of communication.

Introduction

Communication is a manner of interacting with people through the means of language, gestures, etc. The concept of communication, though, "…in a more general sense, refers to the process of emission, transmission and reception of information in different systems and situations…"(Bîltac, Gh., 2008).

Behaviour gives birth to a new social relationship which will lead to the distribution of pupils'/students' behavioural acts as a new manner of answering for the professor's types of communication. "The importance of this new approach perspective consists of considering communication a collective activity, driven by rules assimilated unknowingly. For this reason, it is necessary to emphasize a communication grammar, which makes it possible for us to coordinate each participant in the communication process" (Oprea V., 2009).

In other words "the communicator and interpreter must have a common system of abstraction and typicalization" (McQuail, D., 1999), event which determined us to approach this research, through which we aim to bring to the forth a long debated issue, but less approached in practice, regarding the distribution of behavioural acts for pupils/students, which may represent a new and efficient manner of training and answering the professors' types of communication.

The act of communication belongs in the same extent to the subject and object of general education between that it realize a way of transmission-reception of necessary information for building some performance or energetical skills.

The dimension of communication act takes a special importance in realise quality and efficiency instruction process. In this acceptance we think that prepairing message that will be transmited to the student/ sportsman should be made in advance into an operational didactical project cadre, and more exactly in the didactical scene in which, with help of already done operational didactical project, are being prepaired also the means and contents from comunication act of the information to the students/ pupils. All those form pull the interes for improving communication act in scene of organization forms in physical education teaching or realise of sportive instruction. It is well known that the educational process is accomplished through and for communication, being ultimately an act of communication.

Communication, in turn, contains in itself educational potential: transmission of knowledge,training and facilitating the operations of intellectual thinking, self-regulation of intellectual activity, the transmission of codes characteristic of each science, etc.., between communication and education existing an interdependence relation.

Communication, both the teaching and the society level, remains an open question for research into the possibilities of achieving a seamless communication, a communication with minimal information loss, achieving satisfaction for both interlocutors, and where the received message would significantly coincide with the input from the end of issue.

Research purpose

The purposes of this research are:

- Indentifying the types of communication used in the relational sphere, specific to the Physical Education and Sport activity;
- To help choosing the means and methods most efficient in lessons;
- To distribute the pupils'/students' behavioural acts;
- To identify a new manner of answering the professor's types of communication;
- To attract the specialists' attention over the communicational sphere specific for the Physical Education activity.

The objectives which laid the basis of this study were the following:

1. Analyzing the situations when behavioural acts are exercised by pupils/students with the purpose of communicating in Physical Education and Sports activities;
2. Evaluating the efficiency of the specific means and methods for the communication act and distribution of the behavioural acts.

Research hypothesis

This research started from the hypothesis according to which, if within the operational projects (the didactic scenario) we will anticipate and prepare messages, then the reception capacity of pupils/students will increase significantly, event which will lead to a more efficient training for the Physical Education and Sports lesson

The operational process

The entire research has been realized in the conditions of the didactic process, during practical Physical Education lessons of 1st and 2nd year students of the Petroleum-Gas University from Ploieşti, as well as pupils from grades 9 and 10 enrolled in the "Toma N. Socolescu" Group Ploieşti and from the Industrial 1Mai Group from Ploiesti between 2009 – 2011.

Research methods and techniques

In our scientific approach we have used widely known research methods and techniques:

1. Bibliographic study method;
2. Observation method;
3. Measuring and recording method
4. Graphical method;
5. Experimental method.

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

Subjects

This research has been realized on a group of 434 students enrolled in the Petroleum-Gas University from Ploieşti, and on a group of 412 pupils from Ploieşti high-schools (206 pupils enrolled in the "Toma N. Socolescu" Group from Ploiesti, and 206 pupils from the Industrial 1Mai Group, Ploiesti).

Data analysis and interpretation

In order to fulfill the research tasks, and to emphasize the distribution of pupils'/students' behavioural acts as an answer for the professor's types of communication, we have observed the manner in which the pupils/students are prepared/unprepared, attentive/indifferent when receiving the message, we have seen the execution, how they ask for further explanations, have motric auto-corrections or are lacking discipline.

For this reason, and in order to present more clearly all the observed aspects, we have conceived two diagrams – Diagram No. 1 for pupils, entitled *The distribution of the pupils' behavioural acts as a response for the professor's types of communication,* and another diagram – Diagram No. 2 – *The distribution of the students' behavioural acts as a response for the professor's types of communication* – according to the protocol below.

As a result of the analysis for protocol no. 1, which contains the following indicators:

1. Pupils are *ready for receiving the messages*;
2. Pupils are *not prepared, not attentive, not interested;*
3. Pupils *present positive reactions in receiving the messages;*
4. *Frequently expect explanations;*
5. *Expect corrections*;
6. *Demand further explanations*;
7. *Perform with neglection*;
8. *Have motric auto-corrections*;
9. *Present manifestations of indiscipline regarding the distribution of behavioural acts, as a response to the professor's types of communication,* and we have recorded the following aspects:

- Pupils are *ready for receiving the messages* 33, 921 %; (1)
- *Not prepared, not attentive, not interested* 9,235 %; (2)*]*
- *Present positive reactions in receiving the messages* 12,300 %; (3)
- *Frequently expect explanations* 8,26 %; (4)
- *Expect corrections* 6,109 %; (5)
- *Demand further explanations* 4,994 %; (6)
- *Perform with neglect* 9,262 %; (7)
- *Have motric auto-corrections* 10,355 %; (8)
- *Present manifestations of indiscipline* 5,564%.(9)

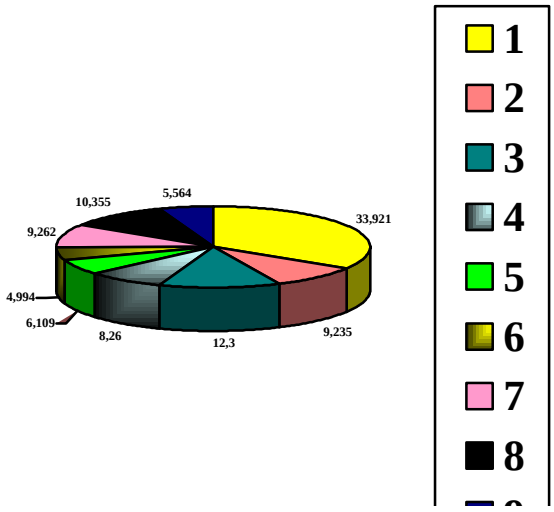

Figure 1. *Results for the distribution of the pupils' behavioural acts as a response for the professor's types of communication*

After the analysis of the observation protocol No. 2, identical with the observation protocol No. 1 regarding the observed indicators, but applied at another level – students – with the same purpose – *the distribution of the students' as a response at the professor's behavior acts*, the following results have been found:

- Pupils are *ready for receiving the messages* 41,026 %; (1)

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
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- *Not prepared, not attentive, not interested* 14,018 %; (2)
- *Present positive reactions in receiving the messages* 5,438 %; (3)
- *Frequently expect explanations* 4,15 %; (4)
- *Expect corrections* 11,096 %; (5)
- *Demand further explanations* 8,346 %; (6)
- *Perform with neglecting* 8,566 %; (7)
- *Have motric auto-corrections* 5,988%; (8)
- *Present indiscipline manifestations* 1,372 %.

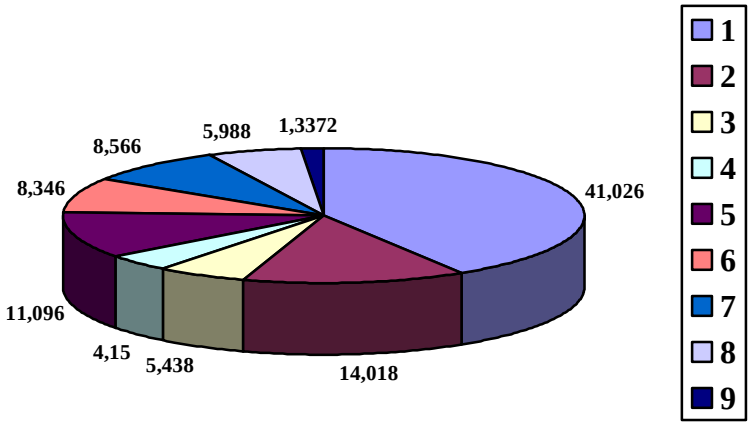
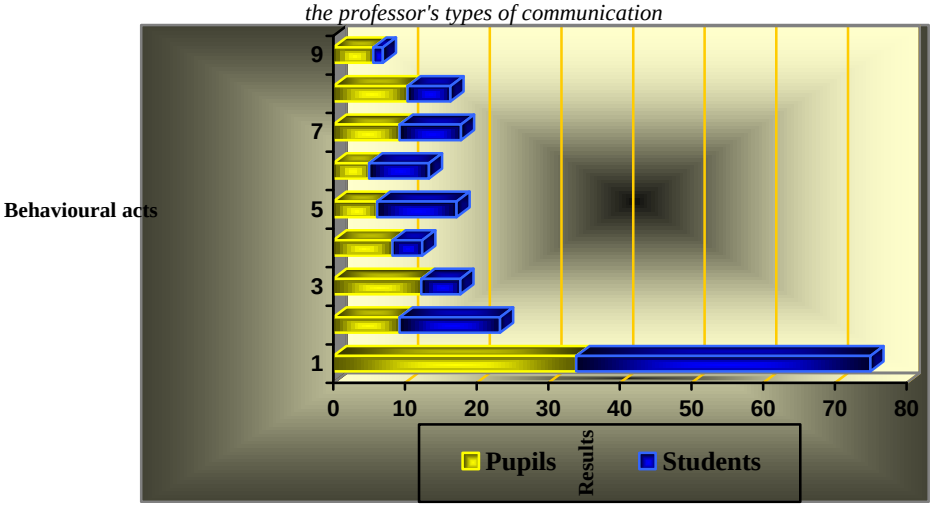


Figure 2. *Results for the distribution of the students' behavioural acts as a response for the professor's types of communication*

Analyzing the observation protocols No. 1 and No. 2 *the distribution of the pupils' behavioural acts (see diagrams No. 1 and 2) as a response for the professor's types of communication* we may observe the differences between the values of their behavioural acts:

- Pupils 33, 921 % are less *prepared for receiving messages* than students 41,026 %; with 7,105 %;
- In the case of the conduct regarding the *not prepared, not attentive, not interested,* students 14,018 % register values smaller with 4,783 %, compared with pupils 9,235 %;
- Pupils present *an increased positive reaction in receiving the messages,* registering values of 12,300 % with 6,862% more than the students who have 5,438 %;
- The percentage for the *expecting explanations* conduct registers the value of 8,26 % at pupils with 4,11% more than the percentage registered by the students 4,15 %;
- At the conduct – *expecting corrections*, pupils 6,109 % present themselves with a percentage 4,987 % less than the students' 11,096;
- Pupils *demand for further explanations* in a lower percentage 4,994 % with 3,352% less than the students' 8,346 %;
- In what the conduct *neglecting the performance* is concerned, an increase of the percentage for the pupils 9,262 % with 0,696% more than 8,566 % at students;
- For pupils we encounter *motric auto-corrections* with a percentage of 10,355 % , 4,367 % higher than students 5,988%;
- For the indicator regarding the *manifestations of indiscipline*, pupils 5,564% have a value higher with 4,192% as compared to the students with 1,372 %.

Graph No. 1 *Presenting the differences regarding the results of the analysis of pupils'/students' behaviural acts from protocol No. 2 - a new manner of answering the professor's types of communication*



Conclusions

The professor is an active character, being the link of the relation and the stimulus of the lesson, and of the distribution of behavioural acts for pupils/students.

Among the activities of behavioural distribution we most often find: explaining, demonstrating, demanding to participate, defining, comparing, stimulating, directing, and creating discipline.

The professor is the character with the most numerous corrective reactions and with a direct involvement in the distribution of pupils'/students' behavioural acts.

The repertoire of the decisions specific for the class activities is varied.

Pupils/students are those who have answered to the professor's demands and who have entered in the flux of interaction oriented towards action, knowledge, creation, which led to a significant multiplication of events which will, in time, end with a more efficient training in the lesson of Physical Education and Sports, thus confirming the hypothesis.

The pupil must have initiative and to hold responsibility, to cherish the experience gained during the learning process.

For the learning process one must not ignore any of the positive means, and pupils/students must be advised to make an entire use of their capacities in this purpose.

We attempt to relax the pupil/student through conversations with subjects of a general interest regarding the activity of Physical Education and Sports.

When the pupil/student successfully learns a new motric act, and can accomplish what the professor told him, the communicational flux is opened, which makes training more efficient, thus confirming the hypothesis.

Quality and efficiency of pedagogical communication specifical to phisical education might be richen if the message that are sent to the scholars, students and reception condition (codification - ancodification) are optimisated.

In psysical education and sport are used many comunication types. Those are taken like independent variable, manipulated into such a way as always instructional objective are realised.

All communication types are used if involved factors into the communication of pedagogical message are facilitated the teaching- learnig-evaluating activity. In this way can emited the presumtion that the concret situation in which is expand teaching- learnig-evaluating activity in psysical education and sport, are those which define chooseing the right communication type.

It is necessary that utilised or specifical communication types in pshysical education and sport to be treated in systemical – cybernetical vision. Thereby the tree elements (subject- process-object) made an ansamble in which is prepairing, transmiting, acquiring and rechecking sent message in teaching-learning-evaluating activity cadre.

The pupil /the student are the one to respond to the teacher's requests and have to enter into the flow and interaction-oriented action, knowledge, creation. The pupil must have initiative and take responsibility, value the experience in the learning process.

The teacher:

- is the most active character with the integrative role;
- stimulates both form and content of activities (thinking what he is teaching, who, when, what
- methods, means and for what purposes);
- the most common activities: explanation, demonstration, application with argument,

- definition, comparison, inference, a conclusion, stimulation, guidance, challenging the
- students' responses, with a view to discipline;
- has the most frequent reactions of corrective type;
- has a large repertoire of decisions specific to the classic regulatory activities, evaluation,
- support, encouragement, explanation, questioning.

The pupil / the student is the one to respond to the teacher's requests and has to enter into the

- flow and interaction-oriented action, knowledge, creation. The pupil must have initiative and take
- responsibility, value the experience in the learning process.

The pupil / the student use the following conducts:

- voice-hearing and visual gesture reception;
- non-verbal attention to each code;
- motor gestures accompanying verbal language (adjustment and adaptation);
- regulating the conduct;
- inter-individual communication;
- early retroaction (feed - forward);
- socio-motor representations;
- gestures of control;
- affective movements.

The main subsystem of the teaching in physical education is the educational or instrucţional action itself.

In physical education and sports are used more types of communication. They can be taken as independent variables manipulated so that the targeted instructional objectives are always achieved.

This requires substantial improvements in the communication act

Communication, in turn, contains in itself educational potential: transmission of knowledge, training and facilitating the operations of intellectual thinking, self-regulation of intellectual activity, the transmission of codes characteristic of each science, between communication and education existing an interdependence relation.

Communication, both the teaching and the society level, remains an open question for research into the possibilities of achieving a seamless communication, a communication with minimal information loss, achieving satisfaction for both interlocutors, and where the received message would significantly coincide with the input from the end of issue.

This study complements the various studies conducted so far in this field, scientific approach to the topic mentioned leads eventually to a progress in terms of communication relative to teaching physical education classes and sports.

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AN EVALUATION REGARDING THE EFFICIENCY OF PROFESSORS' BEHAVIOURAL ACTS IN PHYSICAL EDUCATION LESSONS.

OPREA VIOREL[1]

Abstract

Problem Statement: This study complements the various studies conducted so far in this field, scientific approach to the topic mentioned leads eventually to a progress in terms of communication .

Purpose of Study: This research has been undertaken on a group of 24 professors within high school and university levels of education, with a pro-efficient formation, Ph.D. graduates (9 professors), and grade I teachers (in number of 15). The teacher is the most active character with the integrative role and the one who stimulates both form and content of activities. It has the most frequent reactions of corrective type and he has a large repertoire of decisions specific to the classic regulatory activities, evaluation, support, encouragement, explanation, questioning.

Research methods and techniques. The research methods and techniques used to address the purpose and research objectives are: Bibliographical method; Observation method; Statistical-mathematical method; Graphical method; Experimental method.

Findings: The research was mainly conducted in indoor and outdoor sport fields and tracks of the Petroleum-Gas

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Email: vopreaefs@yahoo.com
Received 09.05.2012 / Accepted 06.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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University of Ploiesti, of the Industrial 1 Mai Group, Ploiesti from Ploiesti.

Conclusions: If we identify types of communication used mainly by the teachers of physical education and sports and we include them in the teaching scenario, like a provoked educational event, then the quality and effectiveness of teaching physical education and sports will increase dramatically.

Keywords: professors, physical education, high school and university levels of education.

Introduction

The series of behavioural acts used by professors in the relationship between pupil/student-professor – within the Physical Education lesson in high-school and university levels of education represent a determinant element in communication and the relationship which will be established along the instructive process, because Physical Education and Sports activities "…are conceived for humans, in certain social and financial conditions, which makes the two types of motric activities formative-educative elements of a great value." (Dragnea A., 2000, Colibaba-Evulet , 2007).

The teacher is the most active character with the integrative role and the one who stimulates both form and content of activities.

It has the most frequent reactions of corrective type and he has a large repertoire of decisions specific to the classic regulatory activities, evaluation, support, encouragement, explanation, questioning (Biltag, 2008, Oprea, 2008).

Purpose of the research

Approaching the issue of the chosen theme, this paper aims the following:

- To identify the behavioural acts used by professors in the relationship between pupil/student-professor - within the Physical Education lesson in high-school and university levels of education;
- To identify types of communication used within the relational sphere, as a characteristic of Physical Education and Sports activities;

Objectives of the research

The objectives which were at the basis of the realization of this study were the following:

1. The analysis of the moments when the identification and difference of behavioural acts occurs, these being used by professors in the pupil/student-professor relationship;
2. An evaluation regarding the efficiency of professors' behavioural acts in Physical Education lessons.

Research hypothesis

This research has started from the hypothesis according to which if we will identify the types of communication mainly by professors of Physical Education and Sports and we will include them in the didactic scenario, as a provoked pedagogical event. As a consequence, the quality and efficiency of teaching Physical Education and Sports will increase**.**

The operational process and the subjects involved in the research

This research has been undertaken on a group of 24 professors within high school and university levels of education, with a pro-efficient formation, Ph.D. graduates (9 professors), and grade I teachers (in number of 15), from the Petroleum-Gas University of Ploieşti, and from the Industrial 1 Mai Group, Ploiesti , between 2009 – 2011.

Research methods and techniques

In our scientific approach we have used widely known research methods and techniques:

1. Bibliographic study method;
2. Observation method;
3. Measuring and recording method;
4. Graphical method;
5. Experimental method.

Research content

For the identification and differentiation of behavioural acts, the professor is the active character, having an integrative role, thinks of the subject he teaches, of whom he teaches, when, with what methods, means and purpose, using corrective reactions, he has the right of decision and an important role for the following indicators, part of the Ph.D. thesis, *Types of communication and their use in Physical Education and Sports,* sustained by Oprea Viorel în 2010 Piteşti, chapterVI:

A. Organizing and structuring indicators;
B. Indicators of communication distribution;
C. Indicators of resolution and evaluation;
D. Indicators for the manifestation of the formative potential;
E. Indicators for values modeling;
F. Indicators of the socio-affective climate;
G. Indicators of creativity stimulation.

A. Organizing and structuring indicators are indicators which:

- the professor organizes and leads the didactic process
- conceives the objectives necessary for the didactic process

- creates the algorithms for the lesson
- structures a series of content elements
- uses in the lesson the demonstration and presentation, on their basis creating an argument for his/her actions;

B. Indicators of communication distribution - In this situation, the professor will turn to:
- the creation of an interactive situation and will demand interactive answers
- the frontal and individual demand of the pupils/ students in the lesson.

C. Indicators of resolution and evaluation
- the activities (motric, cognitive, active, affective, moral) of pupils/students are directed-evaluated through the means of three behavioural types: positive, negative and neutral.

D. Indicators for the manifestation of the formative potential:
Through this type of indicators we aim that the professor to become an objective, which will lead in time to a stimulation of behavioural acts and attitudes of direct communication of one's criticism, and a personal presentation – reflexive and interpretative.

E. Indicators for values modeling:
These indicators point to the capacity of evaluation and implementation of: models, values, social and group positive attitudes; strong moral-character values and attitudes; practicing models and a horizontal-vertical transfer of positive working experiences and positive attitudes derived from these.

F. Indicators of the socio-affective climate:
In the sphere of the pupil's/student's personality or within a group of pupils/students, the main types of styles, actions or influences may be direct, indirect or combined from the two characteristics through the domination of the empirical values (Andersen,2007).

G. Indicators of creativity stimulation:
Creativity is an important parameter for the Physical Education lesson, this being the motivation which determines the professor to turn towards the establishment of a creative behaviour of the pupils/students, who are seen as individualities, as members of the group, and have to use the following indicators within the lesson; non-verbal communication which is a substitute – a gesture of indicating the pupils which helps at their training, and the arrangement of materials; uses object language; codes of performing the tasks, associated with body motion and face expressions; the linguistic unity; spatial and temporal codes; feed-back; technical and tactical codes; the language of signals and warning (Argyle, 2005).

The results obtained and their interpretation

Involving all the above mentioned aspects, the professor is thus directed towards the establishment of a creative behaviour of the pupils/students, seen as individualities, as members of the group.

It is very important to mention, before analyzing and interpreting the data, that in the nowadays society "…the professor of Physical Education and Sports presents himself as a package of duties, given in the first place by the position of educator, and, secondly, by the profile of his/her specialization, which is Physical Education and Sports, motric activities different in comparison to other instructive-formative activities" (Dragnea A., 2000).

In Bontaş's (1994) opinion (Oprea V., 2009), "…the didactic communication is a professional communication of the professor with the student within the didactic process – the lesson – and outside of it, oriented towards the creation of a favourable social and psychological climate."

That is why we believe that after the identification of the various communication types, mainly used by professors of Physical Education and Sports, we could include them in the didactic scenario, as a provoked pedagogical event. As a consequence, the quality and efficiency of teaching Physical Education and Sports will increase.

For this reason, we have undertaken this study, and the data were registered and interpreted according to Table No. 1, *Observation protocol regarding the identification of the professors' behavioural acts in Physical Education lessons* and Graph No. 1, *Representative graph regarding the identification of the professors' behavioural acts in the Physical Education lesson for the high-school and university levels of education*, aimed to improve the teaching system, with the purpose of increasing the efficiency of training and opening new directions of research for other specialists.

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
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Table 1. *Observation protocol regarding the identification of the professors' behavioural acts in the Physical Education lessons*

Behavioural acts	Average
A. Frontal relation	7,68
B. Individual relation	7,836
C. Receptive to the pupil's/student's behaviour	6,321
D. Intervenes when mistakes are made	6,232
E. Demonstrates	*9,787*
F. Demonstrates with the help of other means	1,787
G. Demonstrates –explains	6,402
H. Corrects (explains)	7,357
I. Verbal communication	16,156
J. Non-verbal communication	6,675
K. Para-verbal communication	5,787
L. Combined communication	5,342
M. Makes the pupils/students active	8,031
N. Disciplines the class	4,218
O. Reactions feed-back	4,215
P. Evaluating the behaviour for pupils/students	3,445
Q. Ensured retention	3,654
R. Authority chosen as the ruling style	4,323
S. Democracy chosen as the ruling style	3,576
T. A combined ruling style	3,398
U. The quality of the information transmitted	5,457

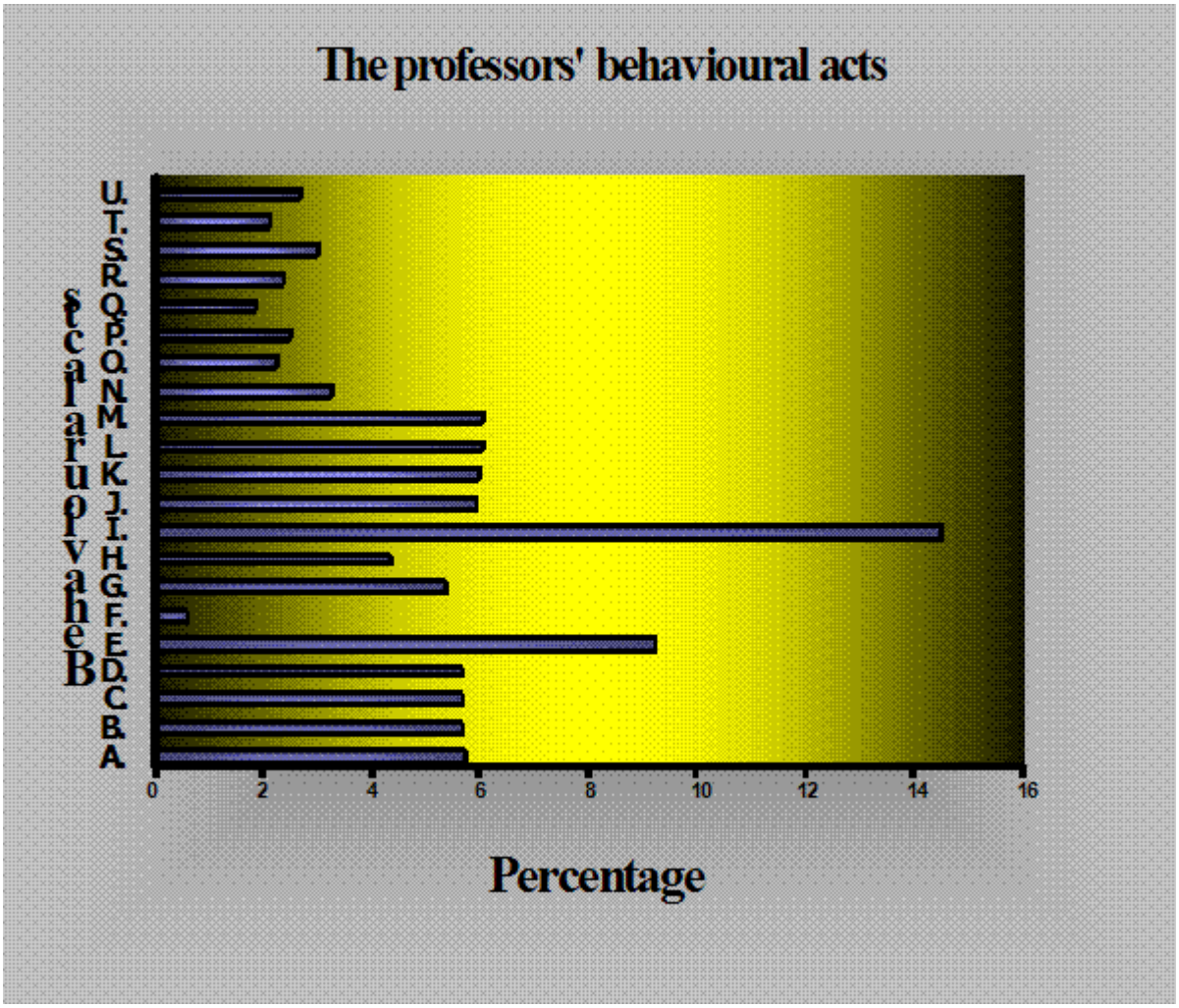
In what the *identification of the professors' behavioural acts in Physical Education lessons* is concerned, we can observe that:

- For behaviours regarding the types of relations, and here we refer to *frontal and individual relations*, we have recorded values close to 7,68, respectively *7,836*, values which show that these behaviours can be improved;
- Another behaviour observed and close to the value of the precedent is the one regarding the *professor's receptiveness to the student's behaviour,* with a value of *6,321*;
- *Interventions when mistakes are made* are recorded with a value of 6,232 this also being eligible for improvement;
- Professors have the best indicators for behaviours - *demonstrates 9,787 verbal communication* 16,156 and *make the students active* 8,031;
- The categories of behaviours which need a greater attention and which have to be further studied are: *the ruling style, ensuring retention, evaluating the students' behaviour, reactions to feed-back, disciplines the class*, at these the professors having values under the average of *5*;
- *Demonstrates with the help of other means* is the behaviour which has recorded the lowest average 1,787;
- The category of conducts which represent a real interest for us, and which has been studied, is the one regarding types of communication used by professors of Physical Education and Sports during lessons, and which shows that, in what the *non-verbal communication* 6,675, *the paraverbal communication* 5,787, *and the combined communication* 5,342 having an average of 4, these have to be implemented, in order to realize a more efficient and complex act of education;
- These low values concerning communication types show us a low value for the *quality of the* 2,657,

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

which is unpleasant, due to the fact that this behaviour has repercussions over the feed-back.

Figure 1. *Representative chart regarding the identification of the professors' behavioural acts in the Physical Education lessons in high-school and university levels of education*



Caption: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, R, S, T, U – these letters correspond to the indicators in Table 1 with the Observation protocol regarding the identification of the professors' behavioural acts in the Physical Education lessons.

Conclusions

The behavioural acts regarding types of relations, and here we refer to *frontal and individual relations*, we have recorded values close to 7,68, respectively 7,836, values which show that these behaviours can be improved;

Professors have the best indicators for behavioural acts – *demonstrates 9,787*, *verbal communication* 16,156 and *make the students active* 8,031, which confirms the hypothesis according to which, if we will identify the types of communication mainly used by professors of Physical education and Sports and we will include them in the didactic scenario, as a provoked pedagogical event, then the quality and efficiency of teaching Physical Education and Sports will increase significantly;

When the behavioural act is in accordance with the demands and in coordination with all the communication types, the teaching label and the transmitted message are one of great value. Low values recorded for these behavioural acts show a low quality of the transmitted message, thus confirming the hypothesis according to which the efficiency of the instructive process is influenced by the quality and

efficiency of the professor's behaviour during the lesson;

Summary of communication is the message, and usually seeks a purpose. Messages include transmitted information and the symbol code is intended to provide a specific or personal meaning to this data.

The professor must build the message both in its view and in terms of students, communication being influenced by what students deliberately choose to charge.

One of the biggest mistakes in communication is the teacher wrongly assume that pupils/students know certain information about the subject of the message.

The most important moments in the message are the first few minutes. The ending of message must remind the main ideas, to produce the expected response from students. Efficiency of transmission of a message is given not only by the perfect knowledge of its contents, but also by how it is transmitted.

If the messages to be sent to students and the conditions of reception (coding-decoding) are optimized, the quality and effectiveness of pedagogical communication specific to teaching physical education and sports can be enhanced.

Introduction of modern technology for teaching-learning-assessment in the content of messages and in teaching scenarios will significantly increase the effects of the above processes.

In physical education and sports are used more types of communication. They can be taken as independent variables manipulated so that the targeted instructional objectives are always achieved.

This requires substantial improvements in the communication act. The types of communication used or those specific to physical education and sports should be treated from a systemical-cybernetical view. Thus the three elements (subject-object-process) represents a group in which the transmitted message is being prepared, transmitted, assimilated and checked through the teaching-learning-assessment activities.

The best way and occasion to send the didactic message is the didactic operational project where some events in the teaching operational scenario may be placed in a position to increase the interest of pupils/students to receive messages.

It is better to choose those didactic methods and processes by which pupils/students become predominantly broadcasters in the learning process so that he can learn easier and more quickly the skills. The preferred methods are the active ones, enabling students to engage in activities, satisfying their curiosity and need for action, indicating its creativity and imagination.

If the messages to be sent to pupils/students and the conditions of reception (coding-decoding) are optimized, quality and effectiveness of educational communication specific to physical education and sports can be improved.

The categories of behavioural acts which need a greater attention and have to be further studied are those related to the ruling style, retention insurance, behaviour evaluation, reactions to feed-back, and collective discipline;

This study completes the various other studies realized until present days in this domain, the scientific approach of the mentioned subject, finally leading to progress regarding didactic communication, reported to Physical Education and Sports lessons.

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

EFFECTS OF PLYOMETRIC TRAINING USED IN PHYSICAL EDUCATION CLASSES ON INTERMEDIATE LEVEL

PĂUN LAURIAN[1], PĂUN DAN GHEORGHE[2], ALUPOAIE MIHAELA[2], CĂTUNĂ GEORGE CRISTIAN[2]

Abstract

Purpose

Possessing a professional and scientific experience accumulated by associating the management of teaching-learning process specialised in physical education on intermediate level, with the design, organisation and completion of a thematic scientific research, I have performed an experimental research having as objective, target and work hypothesis the objectivation and assessment of the effects of using the plyometric exercises included in the syntagm known as *"plyometric training"*, in the structure of the physical education classes of the didactic activity of two 6th form classes at school no. 1 from Braşov.

Methods

Observing the conditions related to the performance of an experimental research, for the organisation and development of the one designed and the evaluation of the registered results, the following methods were used: observation; experiment; conversation; questionnaire; explanation, demonstration and correction, using the verbal and non-verbal language; compared analyses of results; statistic processing of results.

Conclusions

The designing, organisation and development of the experimental research according to the topic determined were associated and included in the teaching-learning process specific to the didactic activity subordinated to the content and objectives of the physical education curriculum for intermediate level.

The results registered and their determining causes has validated the work hypothesis enounced and has objectivised the achievement of the purpose and targets of the research performed, being acknowledged the contributing potential to the improvement of the content of the applicative methodology used for the increase of the efficiency of the teaching-learning process specific to the physical education as didactic activity in the intermediate level.

Key words:

Plyometrics, Eccentric contraction, Concentric contraction, Work with force delivery, Muscular power.

Purpose

Possessing a professional and scientific experience accumulated by associating the management of teaching-learning process specialised in physical education on intermediate level, with the design, organisation and completion of a thematic scientific research, I have performed an experimental research having as objective, target and work hypothesis the objectivation and assessment of the effects of using the plyometric exercises included in the syntagm known as *"plyometric training"*, in the structure of the physical education classes of the didactic activity of two 6th form classes at school no. 1 from Braşov.

Establishing a verification system formed of 6 control tests for the evaluation of the level of manifestation of the physical capacities "speed" and "power" and a set of 12 plyometric exercises, I have configured the base of performing the experimental research, within which the experimental class performed, during 64 classes of physical education, a 10-minute program included in the structure of *"development of physical qualities"*, when the rationalised and standardised plyometric exercises in execution were used.

The plyometric training, in the current form, is synonym to what Verhoşanschi I. considered to be "the work with force delivery" (Verhoşanski I., 1972) pursuant to the research performed on the effect of different methods used for the development of the strength of athletes' feet in the jumping trials using three work possibilities: with their own body weight, with burdens, with depth jumps, from a platform with a height of 0,70 and 1,10m,

- in the first two situations, the exercises relied on concentric muscular contraction, whereas in the last situation, the muscular contraction was eccentric, by extension, thus, it was called "work with force delivery".

The grounding of different training methods used for the development of speed and power, belongs to Ruch T. and Fulton J (1963). who mentioned:

- Frick, who enunciated the concept of "concentric contraction" and "eccentric contraction", as expression of the "state of tension" of the execution muscularity;
- Fenn, who systematized the possibilities of the

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Received 06.05.2012 / Accepted 06.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

" state of tension" in the following illustrative chart (Table 1):

Table 1

Kind of contraction	Function	External force which opposes the muscle	External mechanical work	Rhythm of power supply
• Isotonic shortening	• Acceleration	• Smaller	• Positive	• Increases
• Isometrically constant length	• Fixing	• Equal	• Of no kind	• -
• Extension	• Slowing	• Higher	• Negative	• Decreases

For the terminological universalisation of "eccentric contraction", respectively of the "muscle extension", by deceleration movement, it was adopted the "plyometric" concept which came from "plyo", synonym, among others, to bending, plying".

As opposed to the mistaken translation of "the work for development of power", as being for "development of force" (Zațiorski , 2002), Nett T. and Ullrich (1961), Mollet R.(1961) or Urtebise (1994), I am exclusively and expressly using the concept of "power" since, in general, performance, in most of the sport branches, is determined by the level of manifestation of speed and power in the movement of the body and of its segments in horizontal or vertical plan, in direct relation to the specificity corresponding to each of these.

Considering this manner to achieve the development of the feet strength with significant effects in the increase of height jumps and of speed in movement, I have considered useful and necessary an experimental research focused on the topic of the "effects of using plyometric training in the classes of physical education of intermediate level".

The specialised literature does not contain any research related to the topic approached, thus, I have considered that the organisation and performance of an experimental research with the title mentioned may be included in the constant preoccupation and professional condition related to the la contribution that may be brought to the field of reference, obtaining thus the professional perfection of both the coordinator of the research, and of those who, appropriating it, will register an increased efficiency of physical education classes.

Observing the structural organisation and the relatively standardised algorithmic sequence of topics of the physical education classes, I have considered that:

• if it is introduced a constant demand in terms of the time of execution and standardisation of the subjects of performances,

- then the processing of the data registered during the initial and final verifications, their compared analysis and the determining interpretation of systematised findings,

- shall impose the emphasizing of the determining relations between the results obtained and the validation of the research hypothesis.

The design and performance of the experimental research proposed had as targets:

l. the selection and indexation of the works of reference in the specialised literature;

2. involvement in the performance of the envisaged research of the staff of physical education department of School No. 1 from Brașov;

3. determining the algorithm of research development;

4. determining the subjects, the place and the period of experimental research;

5. elaboration of the control tests of the verification system;

6. elaboration of the records of registration and processing the results of the investigations performed;

7. elaboration of a file on the general structure of research and the distribution of it to the subjects of the experimental class;

8. analysis, processing and interpretation of the results of the experiment performed with the subjects of each class involved in the research, with the staff of physical education department.

Method

Observing the conditions related to the performance of an experimental research, for the organisation and development of the one designed and the evaluation of the registered results, the following methods were used:

- observation;
- experiment;
- conversation;
- questionnaire;
- explanation,

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- demonstration and correction,
- using the verbal and non-verbal language;
- compared analyses of results;
- statistic processing of results.

From designing to completion, the experiment included in its algorithmic development the following:

• presentation, discussion and consensual acceptance within the physical education department of the organisation and development of an experimental research, at the end of the school year 2009-2010, during the school year 2010 - 2011;

• designation of the future classes 4th A and 4th B as experimental class and class of control;

• elaboration of the structure of control tests to be used for the verification of the level of manifestation of the conditional qualities speed and power, presented in tabel no. 2;

• determining the sequence of verifications:

- first, in September 2010;
- second, in December 2010;
- third, in January 2011;
- fourth, in June 2011;

• rationalisation of the exercises to be used in the structure of plyometric training during the physical education lessons of the experimental class, presented in tabel No.3;

• use of plyometric exercises during each lesson of the experimental class in the structure of the ”development of physical qualities within an interval of 10 minutes, observing the content and algorithm of development of each lesson;

• the content and development of the lessons of the class of control were conform to the syllabus for each semester, according to the requirements of the physical education curriculum for the 4th forms.

Table 2

System of verification of the level of manifestation of speed and power in the execution of the following control tests:

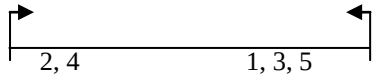
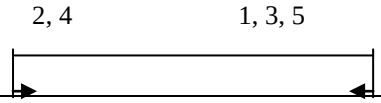
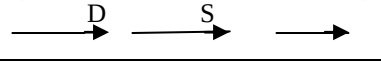
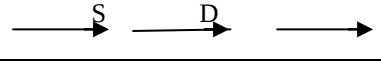
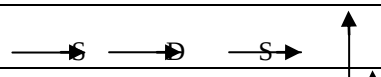
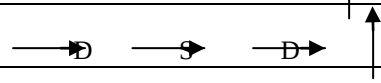
1) 6x5 m, running, with stopping and turning:: • 3 times left, after stopping left-right and • 2 times on right, after stopping right-left	
2) 6x5 m, running, with stopping and turning: • 3 times right, after stopping right-left and • 2 times on left, after stopping left-right	
3) on spot, 3 long jumps in the following order: *” left – right – left”*	
4) on spot, 3 long jumps in the following order: *”right – left – right”*	
1) with 3 steps take off, vertical jump, from the left foot. .	
2) with 3 steps take off, vertical jump, from the right foot.	

Table 3

Plyometric exercises used for ”development of physical qualities”

1.	from the standing position with lateral support on fixed scale : • slow genuflections, on the left leg;
2.	from the standing position with lateral support on fixed scale: • slow genuflections, on the right leg;
3.	on fixed scale, with partner on the shoulders : • slow genuflections on both legs;
4.	from the sitting position with support on legs : • passing on dorsal lying and return, with slow movements;
5.	from facial lying position : • flexions and stretching of arms, with slow movements;
6.	from the sitting position : • deep, slow genuflexions and vertical jumps;
7.	jumping step with landing in deep genuflections on each leg;
8.	jumping step with deep genuflections on each leg;

9.	jumps from gymnastic bench, from the left leg and landing with deep genuflections on the left leg;
10.	jumps from gymnastic bench, from the right leg and landing with deep genuflections on the right leg;
11.	jumps from gymnastic bench, from both legs, landing with deep genuflections;
12.	deep jumps from platform of 0.75 m and landing in deep genuflexions.

Results.

In table no. 4, one presents the results registered on the control tests by the subjects of the experimental class and of the class of control, whereas in table no. 5 one calculates the numeric and percentage differences registered during the verifications performed on Saturday and Sunday.

Table 4
Results registered on control tests for the verification of the level of manifestation of speed and power

Checking	Class	Results on control tests					
		1	**2**	**3**	**4**	**5**	**6**
1	VI A	12.34	12.58	3.38	3.19	0.34	0.32
25-26.09.2010	VI B	12.13	12.41	3.49	3.31	0.36	0.34
2	VI A	11.21	11.39	3.89	3.72	0.43	0.41
18-19.12.2010	VI B	11.79	11.96	3.71	3.51	0.40	0.38
3	VI A	11.48	11.67	3.64	3.54	0.41	0.40
8-9.01.2011	VI B	12.18	12.22	3.41	3.32	0.38	0.35
4	VI A	10.85	11.12	4.21	4.02	0.48	0.46
11-12.06.2011	VI B	11.95	12.05	3.68	3.63	0.39	0.36

Table 5
Numerical and percentage differences between the results registered on the verifications performed

Control test	The difference	Class	Differences between checks			
			V2-V1	**V3-V2**	**V4-V3**	**V4-V1**
1	**d.c.**	**VI A**	1.13	-0.27	0.63	1.49
		VI B	0.34	-0.39	0.23	0.18
	d.p.	**VI A**	9.15%	-2.40%	5.48%	12.07%
		VI B	2.80%	-3.30%	4.09%	1.48%
2	**d.c.**	**VI A**	1.19	-0.28	0.55	1.46
		VI B	0.45	-0.26	0.17	0.53
	d.p.	**VI A**	9.45%	-2.45%	4.71%	11.60%
		VI B	3.62%	-2.17%	1.39%	4.27%
3	**d.c.**	**VI A**	0.51	-0.25	0.57	0.83
		VI B	0.22	-0.30	0.27	0.30
	d.p.	**VI A**	15.08%	-6.42%	15.65%	24.55%
		VI B	6.30%	-7.71%	7.91%	8.59%
4	**d.c.**	**VI A**	0.53	-0.18	0.46	0.83
		VI B	0.20	0.19	0.31	0.44
	d.p.	**VI A**	16.6%	-4.83%	12.99%	26.01%
		VI B	6.04%	-5.41	9.33%	13.79%
5	**d.c.**	**VI A**	0.09	-0.02	0.07	0.14
		VI B	0.04	-0.02	0.01	0.03
	d.p.	**VI A**	26.47%	-4.87%	17.07%	41.17%
		VI B	11.11%	-5.00%	2.63%	8.33%
6	**d.c.**	**VI A**	0.09	-0.01	0.06	0.14
		VI B	0.04	-0.03	0.01	0.04
	d.p.	**VI A**	28.12%	-2.43%	15.00%	43.75%
		VI B	11.76%	-7.89%	2.85%	11.76%

Discussion and conclusion

The compared analysis of the results registered reveals the following findings:

- the differences in x of the initial results certify a positive difference favourable for the class of control;
- in the sequence of the following verifications, the differences become significantly positive and favourable to the experimental class;
- between the results obtained on the tests 1 and 2, the differences registered both between the verifications and between the classes, reveal a better coordination and a more accurate technical execution of left-right stops unlike the execution of the same procedures in the right-left sequence;
- it is emphasized a certain natural predilection for the left leg, as "beating leg", opposite to the right one, on long jumps, by the jumps in the sequence "*left-right-left"* for both classes of the experiment on the tests no. 3 and no. 4;
- the differences registered on the tests no. 5 and 6, confirm the favourable difference of power on the left leg;
- the numerical and percentage values of the differences between the results registered on the verifications no. 2 and no. 3 emphasize a decrease of the value of the results registered on both classes:
  - which confirm the negative effect of the lack of continuity in the physical activity in general,
  - with a lower decrease of the value of the results of experimental class, as an effect of using a program, proposed and accepted and performed on its domicile by each subject of the experimental class.

The differences emphasized between the results registered in the sequence of the verification performed, confirm the efficiency of using plyometric exercise in the experimental class:

- in the 24 lessons, during the period 13.09.2010 – 20.12.2010;
- in the 40 lessons, during the period 10.01.2011 – 12.06.2011.

Pursuant to this research performed, it was acknowledged the possibility to associate the didactic activity specific to physical education on intermediate level to the performance of an experimental research.

The designing, organisation and development of the experimental research according to the topic determined were associated and included in the teaching-learning process specific to the didactic activity subordinated to the content and objectives of the physical education curriculum for intermediate level.

The results registered and their determining causes has validated the work hypothesis enounced and has objectivised the achievement of the purpose and targets of the research performed, being acknowledged the contributing potential to the improvement of the content of the applicative methodology used for the increase of the efficiency of the teaching-learning process specific to the physical education as didactic activity in the intermediate level.

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

THE INFLUENCE OF AEROBIC GYMNASTICS IN IMPROVING THE QUALITY OF LIFE FOR FEMALE STUDENTS IN MEDICAL ACADEMIC ENVIRONMENTS

PRUNEANU MANUELA (PETREANU)[1], PETREANU ADRIAN[1], SIMION GHEORGHE[2]

Abstract

For the young, physical exercises and sport, organized and continuously practiced are the main factors to counter the sedentary lifestyle, stress and intellectual overwork, and to spend pleasant and useful leisure time. This paper is a pedagogical experiment of longitudinal type through which we want to put out the development and implementation of the experimental programs we proposed, by means of aerobic exercises, to improve the effort capacity, respectively, the well being of female students in medical academic environment.

The purpose of this paper is to identify potential biomotric female students in medical academic environment to apply the most optimal variations of specific programs of aerobic exercise.

Studying the problem addressed was achieved by applying the following methods: the study and analysis of scientific scholarly literature (documentary analysis), observations made during aerobic exercise classes, experimental method, methods of measurement and evaluation, tests method and statistical-mathematical method.

Aerobic exercise scientifically performed in a continuous manner, after 4-6 months is starting to have the following results: excess body fat reduction, general body toning, morphogenetic line aesthetics, increases overall body strength in professional activities, daily activities, etc., positively impacting the training of future doctors. The evaluation identified the performantial behavior for each subject that was part of the experiment, assessing the level of fitness at the beginning of the experimental program and after the application of instructional programs, establishing the exact content and their dosage.

Conclusions**:** By applying our proposed programs with content that covers all aspects related to obtaining a "well being" improving quality of life of female students in the medical academic environment; all this leads to learning and assimilation behaviors with higher returns.

Introduction

For the young students, physical exercises and sport are necessary and they contribute to strengthening their health, improving their moving ability and the education of moral qualities that lead to the ideal of balance: *Mens sana in corpore sano*.

Specific requirements that physical education in higher education is required to solve, confer, along with other scientific disciplines, an important role in complete and complex training of future specialists and increasing human performance.

As a last link of the school system, the higher education offers the optimal environment which is able to intervene and to actively influence, the development, conservation and revitalization of biological potential, the vocation to move among these young people.

General fitness is the ability to make a physical effort reported to the type of constitution and age. A good general physical condition is the ability of a person to conduct daily activities (work, school, family), without the installment of an early fatigue and without overstressing the physiological functions of the body. A general physical condition is best maintained through a regular appropriate physical exercise (sport and fitness).

"The way to obtain a good physical condition has no shortcuts. The only valid physical exercise remains the one correlated with a balanced and effective system of recovery " (Kulcsar. S., 2000).

Aerobics is a physical activity with many positive values, with the main reference point in the motor and mental capacity of the individual with beneficial effects on fitness and health.

Performed under the auspices of *Sport for All*, as a default leisure activity, the aerobic maintenance "features special connotations in this respect, mixing up the usable with pleasure, needs with the attractive, the physical and the mind, the effort and relaxation, the individual with the social"(Macovei S. 2007).

The purpose

The purpose of this paper is to identify potential biomotric female students in medical academic environment to apply the most optimal variations of specific programs of aerobic exercise.

Hypothesis

If the content of the lessons with operational structures characteristic to the aerobic gymnastics maintenance, positively influence the training of the future doctors, then it comes to behaviors with higher returns, planning to develop the sides and aspects of life that are needed in their future professional activity, and thus improve the quality of life for young people in

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Received 05.05.2012 / Accepted 06.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

the medical academic environment.

Mtaerials & methods

Studying the problem addressed was achieved by applying the following methods: the study and analysis of scientific scholarly literature (documentary analysis), observations made during aerobic exercise classes, experimental method, methods of measurement and evaluation, tests method and statistical-mathematical method.

The pedagogical experiment consisted in the development and implementation of a specific instructional aerobic gymnastics to the medical academic environment female students from U.M.F. *Carol Davila* Bucharest, this unfolding during two semesters of the academic year, a total of 60 to 72 lessons / sessions of aerobic exercise.

Aerobics programs proposed by installments during the academic year were as follows: classic aerobics, dance aerobics, step aerobics, Latin aerobics, Pilates and objects - strings.

Participants:

The experiment was carried out in the gym of the University of Medicine and Pharmacy *Carol Davila*, inside the Faculty of Medicine; the sample subjected to this pedagogical experiment was represented by a group of female students - in the second year of study at the Faculty of Medicine and who chose to attend both the aerobic basic class within the discipline of Physical Education and Sport, and the experimental programs proposed in the scientific approach represented by aerobic exercise training in maintenance performed outside the academic program, in their spare time.

Instruments: anthropometric parameters, motric parameters (general physical trials - exercises for abdominal muscles, 4-cycle complex jump , push-ups and indicator of the motric capability which summarizes results of the three trials) and functional parameters (the Ruffier index and Harvard test).

Results and discussions

The evaluation identified the performantial behavior for each subject that was part of the experiment, assessing the level of fitness at the beginning of the experimental program and after the application of instructional programs, establishing the exact content and their dosage.

The effects of the instructional programs with operational structures specific to the aerobic gymnastics were followed through the individual observation files.

Fig. 1: Graphic indicator "body weight" - experimental group

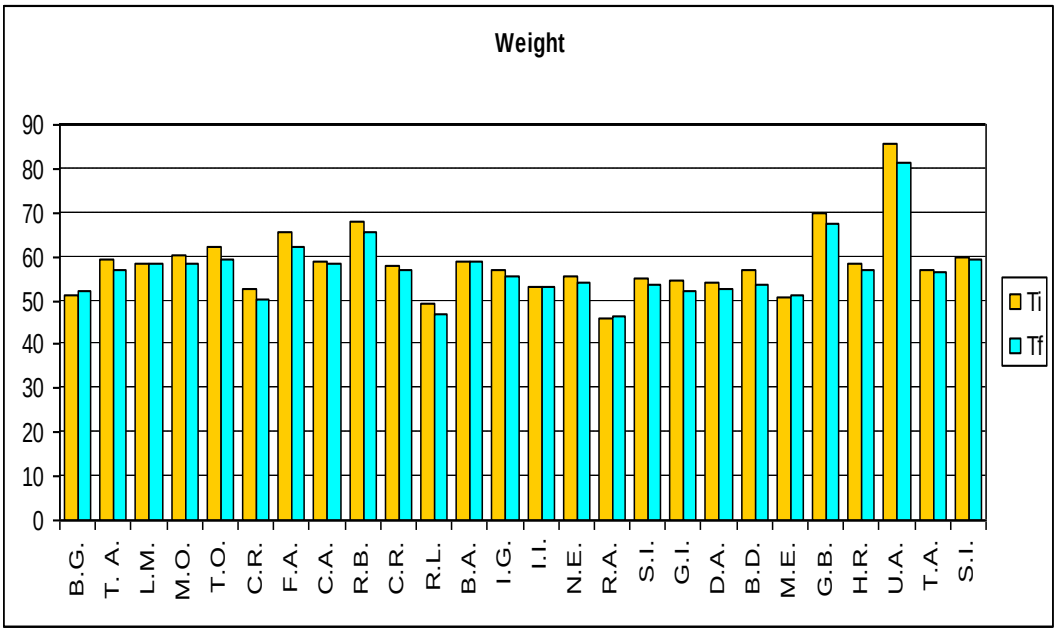

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Fig. 2: Graphic indicator "body mass index" - experimental group

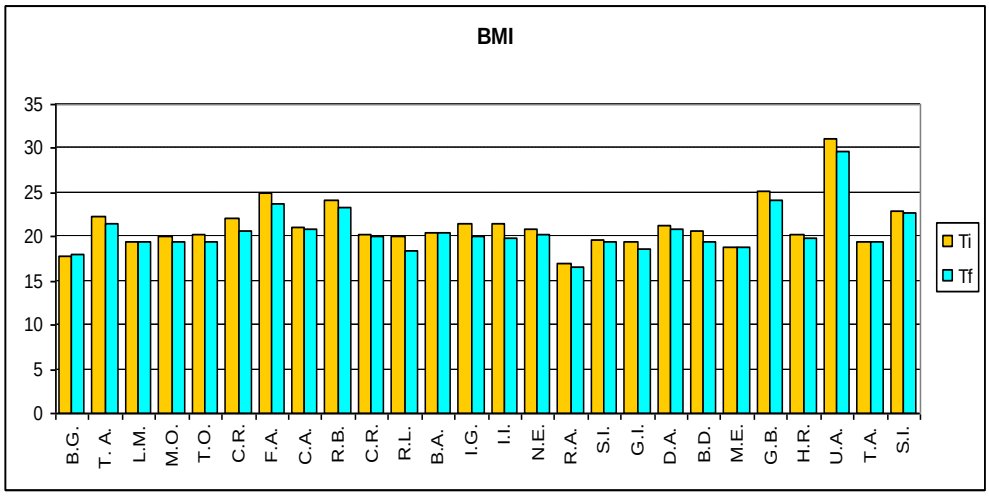

Fig. 3: Graphic indicator " indicator of driving capability" - experimental group

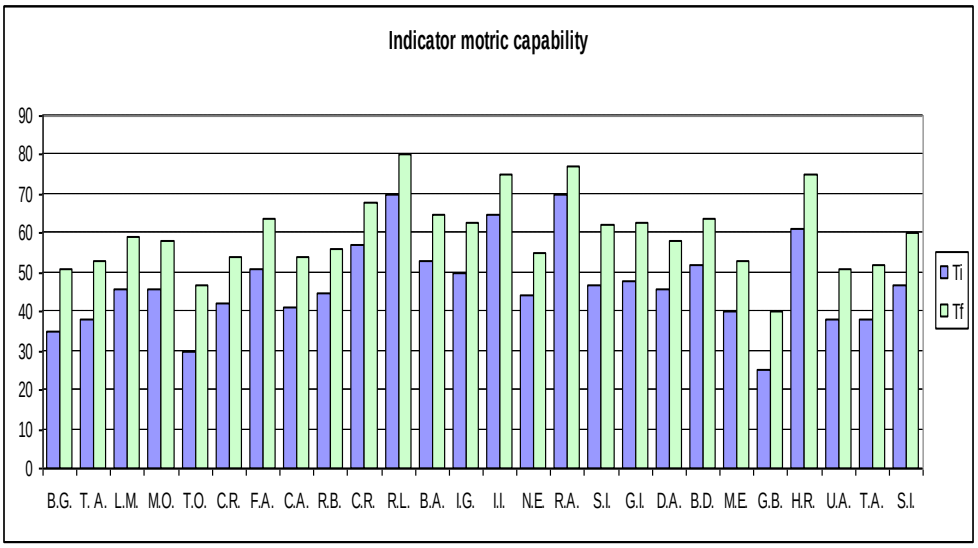

Fig. 4: Graphic indicator " Ruffier index" - experimental group

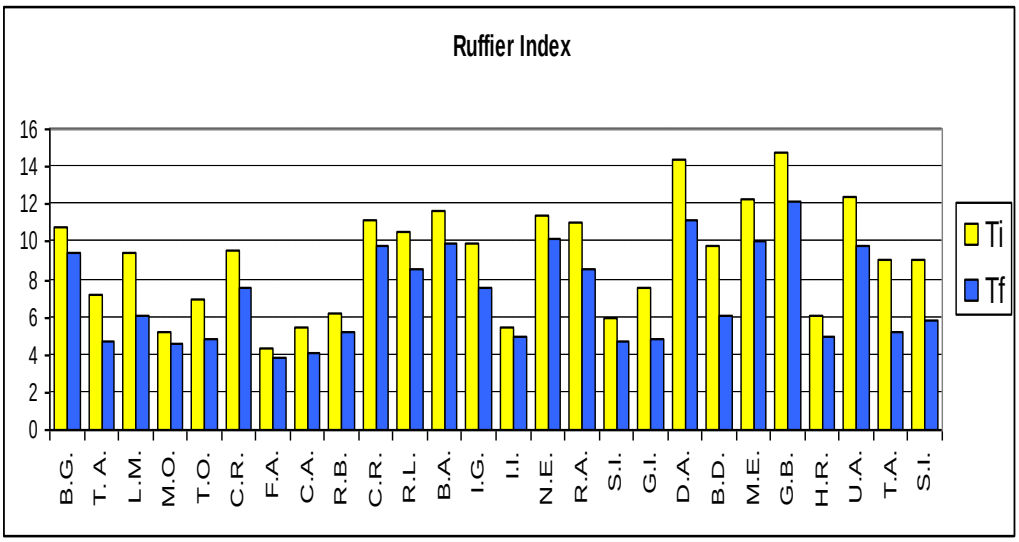

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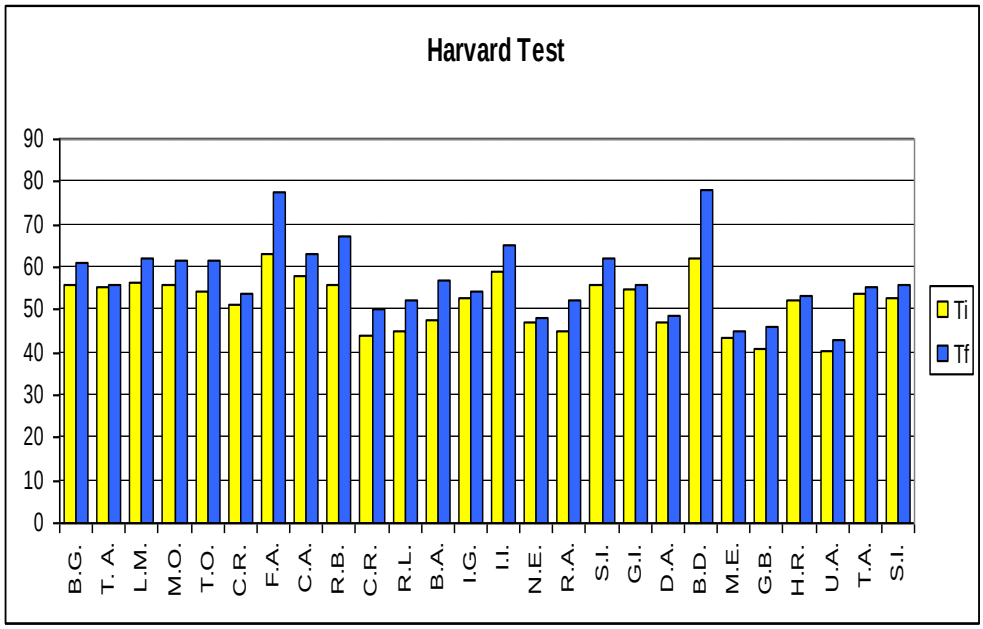
Fig. 5: Graphic indicator "Harvard Test" - experimental group



Tabel 1: Results from the initial and final testing and the dynamics of the evolution of weight and body mass index - experiment group

Statistical indicators	Body mass index		Weight	
	Ti	Tf	Ti	Tf
X	21,26	20,56	58,31	56,91
S	2,89	2,54	7,78	6,98
C.V.	13,17	12,35	13,17	12,26
t	6,092		5,316	
P	significantly < 0,05		significantly < 0,05	
Average growth	3,24%		2,40%	

Tabel 2: Results from the initial and final testing and the dynamics of the evolution of functional indicators trial - experiment group

Statistical indicators	Ruffier index		Harvard test	
	Ti	Tf	Ti	Tf
X	9,14	7,1	51,93	57,14
S	2,89	2,53	6,22	8,76
C.V.	31,61	35,63	11,97	15,33
T	10,731		-6,555	
p	significantly < 0,05		significantly < 0,05	
Average growth	22,31 %		10,01 %	

Tabel 3: Results from the initial and final testing and the dynamics of the evolution of general fitness trial - experiment group

Statistical indicators	Exercises for abdominal muscles		4-cycle complex jump		Push-ups		indicator motric capability	
	Ti	Tf	Ti	Tf	Ti	Tf	Ti	Tf
X	20,03	22,19	10,84	12,19	16,46	24,61	47,11	59,88
S	3,36	2,6	1,75	1,13	8,33	6,27	11,04	7,49
C.V.	16,77	11,71	16,14	9,26	50,6	25,47	23,43	15,99
T	-11,874		-8,611		-15,972		-30,677	
p	Significantly p<0,005		Significantly p<0,005		Significantly p<0,005		Significantly p<0,005	
Average difference in growth	10,73%		12,36%		49,51%		27,08%	

Fitness and exercise capacity assessment through trials and proposed tests has shown that students subjected to the experiment have achieved significant differences in all seven trials and tests, as follows:

- From the information obtained from initial and final testing anthropometric indicators, we have observed that the programs we proposed, significant increases in average from the initial to the final testing and calculating the "t" test which showed significant values for the two measurements.
- In terms of functional indicators and tests of physical condition - such as the submaximal exercise capacity - Ruffier Index and Harvard Test achieve significant increases in average from the initial to the final testing experiment, for all subjected students, as well as calculating the "t" test which showed significant values for the two indicators and the two tests.
- From the information obtained by testing the initial and final fitness tests, we have observed that the programs we proposed, achieve significant increases in average from the initial to the final testing and calculating the "t" test which showed significant values for the three trials, respectively the indicator of motric capability.

Conclusions

- Aerobic exercise scientifically performed in a continuous manner, after 4-6 months is starting to have the following results: excess body fat reduction, general body toning, morphogenetic line aesthetics, increases overall body strength in professional activities, daily activities, etc., positively impacting the training of future doctors.
- By applying our proposed programs with content that covers all aspects related to obtaining a "well being" (physical aspect, mental aspect, social aspect, aspects concerning hygiene and nutrition, professional aspects, financial aspects and the lifestyle aspects), improving quality of life of female students in the medical academic environment; all this leads to learning and assimilation behaviors with higher returns.

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COMPARATIVE STUDY OF FORCE TO LEVEL STUDENTS F.E.F.S.

TEUŞDEA CLAUDIU[1], BUTU MARIA[1], TEODORESCU SIMONA[1]

Abstract

Purpose. Our research aims at benchmarking the quality of the students driving force specialization and Special Motion Physical Therapy (KT) and Physical Education and Sports (EFS) from the Faculty of Physical Education, Spiru Haret. This study aims to achieve a database that provides the possibility to analyze the various issues relating to the potential biomotric and to observe trends in these categories of students, to intervene with appropriate means to improve the findings.

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Received 10.05.2012 / Accepted 16.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

Ways. For carrying out the work we used the following research methods: bibliographic study method, observation method pedagogical practical test method, statistical and mathematical methods; plotting method.

Results. There were mixed results on samples from students in sports and those in physical therapy indicators highlighted by applying statistical and mathematical

Conclusions. The results should be considered by all teachers working with student groups from two specializations to intervene with appropriate means to improve the findings.

Keywords: General strength, Physical Therapy, Physical Education.

Purpose

Driving force is one of the qualities required more physical activity. It is the basis of simple skills and its importance increases in direct proportion to the aim in the training and development of basic motor skills specific to the various branches of sport.

Quality force increases relatively quickly, but lack of concern for developing and maintaining it soon leads to a decrease in parameters used in the preparation.

Force development can start right from the age of 10 years, if special care manifest in the grading exercise (O. Bompa, 2001).

The force development process is recommended to use exercises and traction climbing which defeats their body weight, gradually introduce the work with objects of different sizes, and partner exercises.

Forms of expression:

Depending on participation muscle groups, are:

♣ *general power*, which refers to the degree of development of the whole muscular system.

It is characterized by an increased capacity manifestation of force in different situations: in productive activity, in sports, entertainment. It is also based on a thorough physical training, including sports initiation phase, when it comes to driving quality development and ensure general physical training, as harmonious. Note that it is the subsequent training, specific force, engaging, through contraction, the main muscle groups, to overcome any resistance;

♣ *specific or special power* is his own sports activities, allowing "entry" to work to overcome resistance to one or a few muscle groups.

Allow expression of muscle forces imposed regimes and levels of sport specialization.

Specific force, weight and level of development that differs from one sample to another sport, while the overall strength varies from individual to individual (D., George, 2005).

Another classification is based on the nature of muscle contraction, highlights the following forces:

♣ *dynamic force or isotonic*, contraction occurs when muscle fibers following change dimensions. When muscle fibers shorten following the entry into action of agonist muscles (motor), type dynamic force is overcome (regime myometrium), and the fibers are prolonged into action by the antagonist muscles (frenulum) is of type dynamic force transfer (pliometric regime);

♣*force static or isometric* contraction occurs when the result does not change the muscle fibers.

If isometric force, maximum force capacity of the contractor is less than the external resistance;

♣ *joint force*, combined or auxotonică is an alternation of two forces: dynamic and static.

After exercise capacity ratio of force and weight:

♣ *maximum force* or absolute. This can be static or dynamic. Depending on body strength increases when body weight increases;

♣ *relative strength* expresses the ratio of maximum force and weight, the force per kilogram body weight. Relative strength decreases usually with increasing their body weight (A., Nicu, 1999).

After the combination that works together with other motor skills:

♣ *speed under power (explosive);*

♣ *force under strength;*

♣ *force under skill.*

Means used to develop force:

1. The process of lifting weights (or load) by:

♣ continuous growth of load;

♣ increase the speed of the load;

♣ Continuous load increases and decreases.

2. Process of intense and rapid isometric muscle contractions (dynamic effort method);

3. Power-training process;

4. Method repeated efforts to overflowing;

. Method isometric efforts;

6. Process circuit (S, Todea, 2005).

Methodical force development:

Performing exercises of force required prior locomotor training. Exercise of force will be alternated with action to develop flexibility, skill, speed. Force development we select only those exercises that can be executed correctly by the student. Establishing muscle groups that want to address to comply with the idea of developing overall body strength. Setting rational load and their progressive growth will be based on age and level of training of students. The best results are obtained with a load of 50-70%.

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
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Strength exercises will be followed by pauses that allow the body to restore exercise capacity. Force is a perfect quality by ensuring continuity exercises. It will focus on developing explosive strength and extensor.

Methods

Thus, personal data of students in specialized somatic and Special Motion Physical Therapy (table 1) and the specialization of Physical Education and Sports (table 2), were assessed as follows:

♣ ***Age*** - was recorded in **years,** his favorite chronological age that subjects were at that time.
♣ ***Height of the body*** - is the longest of the human body. This was measured between vertex and plane plants. Subject standing with his back to staturometru, legs and spine as straight, head up, eyes forward. Size was determined and recorded in **cm** sheet.
♣ ***Weight*** - was measured by the scales. Subjects were equipped, and weighed without shoes in the morning. Weight was recorded in **kg**.

Table 1. Personal data and somatic of students specialized in Special Motion and Physical Therapy

No.	Personal			Data somatic	
	Name and surname	Age	Sex	Weight (Kg)	Height (cm)
1	A. M	20	M	72	170
2	B. D	40	M	107	175
3	B.I	22	M	88	177
4	B.R	23	M	78	182
5	B. S	22	M	71	180
6	C. A	19	M	80	184
7	C. F	20	M	77	172
8	C.E	21	M	78	181
9	C.R	22	M	82	187
10	D. C	20	M	60	178
11	D. Cr.	40	M	72	180
12	D. A	23	M	77	170
13	D.I.	31	M	89	186
14	D.M	33	M	76	173
15	E. M	29	M	75	178
16	E.P	22	M	70	176
17	F. L	31	M	62	175
18	F.M	24	M	66	184
19	G. E	19	M	80	180
20	G.R	21	M	71	185
21	G.M	23	M	76	189
22	G.S	22	M	74	175
23	H. L	20	M	72	180
24	H. G	20	M	80	180
25	I. M	22	M	84	182
26	Î. A	20	M	63	184
27	L. A	19	M	80	178
28	M. I	19	M	74	170
29	M. C	19	M	80	184
30	M. E	19	M	80	173
31	M. A	46	M	70	170
32	M. M	19	M	75	180
33	M. Ion	27	M	75	184
34	M. C	19	M	79	190
35	O. R	32	M	55	165
36	X	24,22	M	75,65	1,78
37	S	6,88	M	9,11	0,06

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Table 2. Personal data and somatic of students specialized in Physical Education and Sports

No.	Personal			Data somatic	
	Name and surname	Age	Sex	Weight (Kg)	Height (cm)
1	A.A.	21	M	68	1,75
2	A.M.	21	M	68	1,75
3	C.V.	22	M	51	1,61
4	L.N.	21	M	50	1,73
5	S.A.	25	M	50	1,60
6	P.A.	22	M	56	1,70
7	D.A.	25	M	62	1,75
8	S.H.	26	M	68	1,75
9	C.M.	23	M	79	1,82
10	Z.M	25	M	78	1,75
11	L.V.	21	M	76	1,91
12	T.I	36	M	105	1,74
13	M.A.	43	M	66	1,75
14	T.A.	25	M	65	1,76
15	D.I.	22	M	98	1,91
16	D.M.	23	M	72	1,69
17	C.I.	21	M	84	1,78
18	T.A.	21	M	60	1,70
19	C.M.	32	M	92	1,90
20	T.M.	32	M	81	1,79
21	G.I.	22	M	62	1,83
22	V.D.	33	M	62	1,78
23	P.S.	22	M	60	1,74
24	L.A.	23	M	64	1,78
25	D.I.	32	M	80	1,75
26	M.S.	35	M	87	1,76
27	V.V.	23	M	85	1,73
28	A.G.	24	M	56	1,65
29	T.C.	43	M	96	1,80
30	V.D.	25	M	85	1,82
31	A.J.	26	M	72	1,75
32	R.D.	29	M	68	1,80
33	R.R.	33	M	66	1,76
34	G.P.	34	M	77	1,86
35	H.T.	23	M	62	1,70
36	X	26.68	M	71,74	1,76
37	S	6,19	M	13,90	0,07

Regarding data from students in two majors

(Table 3 - KT, Table 4 - EFS) to test the quality of driving force, were assessed as follows:

♣ ***Abdominal strength***: the dorsal lying, feet set, is to lift the trunk with hands behind your head, the maximum speed for 30 seconds. There have been correct lifting the **number of repetitions** in the allotted time.

♣ ***Back muscle strength***: from a lying face, hands behind your head, feet fixed to lift the trunk so that trunk is approaching the vertical speed maximum time of 30 seconds.

There have been correct lifting the **number of repetitions** in the allotted time (I., M., Butu, M., Butu, I., Constantinescu, S., Macovei, 2012).

♣***Explosive force (expansion)***:

first measurement was made in standing with the wall right shoulder, right arm stretched out above, the second measurement was the peak of the vertical jump. It made the difference between first and second measurement, was assessed in **cm**.

♣ ***Force arms***: the position of supporting the student has executed pushups.

Performances were assessed only correct and recorded **the number of repetitions**.

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Table 3. The results of students in specialized Physical Therapy and Special Motion to force testing

Subjects	Traction data			
	Force abdomen	Force back	Explosive force	Force arms
1	16	17	10	13
2	17	16	40	7
3	20	31	51	18
4	21	17	30	33
5	4	20	30	30
6	30	32	55	16
7	32	32	63	20
8	17	25	55	20
9	25	27	66	31
10	21	32	40	40
11	32	29	65	30
12	32	29	50	30
13	20	22	55	15
14	27	29	40	20
15	24	37	55	23
16	23	28	44	20
17	18	32	34	12
18	25	29	65	38
19	28	33	57	16
20	30	30	45	15
21	30	33	50	20
22	17	21	40	8
23	22	37	53	7
24	23	31	50	27
25	25	33	45	10
26	22	29	48	9
27	23	31	42	15
28	20	34	40	12
29	16	28	39	11
30	18	24	36	9
31	20	22	39	12
32	25	29	47	8
33	20	33	49	5
34	23	32	44	17
35	18	28	43	6
X	22,4	28,34	46,14	17,8
S	5,77	5,44	11,31	9,44

Table 4. The results of students in specialized Physical Education and Sports to force testing

Subjects	Traction data			
	Force abdomen	Force back	Explosive force	Force arms
1	25	42	50	52
2	24	44	50	52
3	22	30	35	15
4	18	43	35	15
5	23	30	35	12
6	25	38	47	19
7	15	26	32	15
8	9	25	50	25
9	27	30	50	30

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10	18	35	50	15
11	26	35	60	26
12	13	22	38	7
13	20	37	45	16
14	19	31	50	17
15	15	31	45	1
16	21	34	42	25
17	26	36	50	42
18	26	38	40	31
19	24	37	40	30
20	31	45	55	50
21	14	33	40	19
22	14	37	40	31
23	19	44	32	34
24	19	36	35	20
25	17	40	43	16
26	30	46	42	20
27	15	30	45	30
28	20	33	43	22
29	11	27	34	8
30	25	42	48	42
31	31	41	38	33
32	32	42	40	35
33	17	27	27	25
34	10	23	37	10
35	23	30	37	20
X	20,68	34,85	42,28	24,57
S	6,14	6,58	7,30	12,61

Results

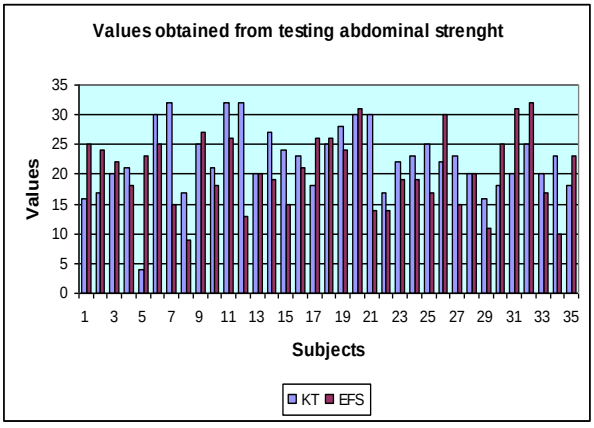

Figure 1. Force abdomen

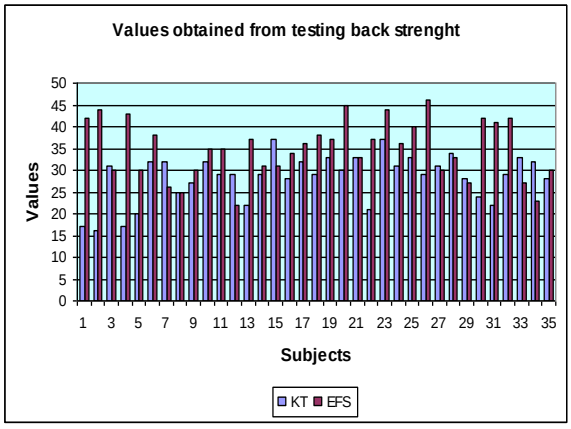

Figure 2. Force back

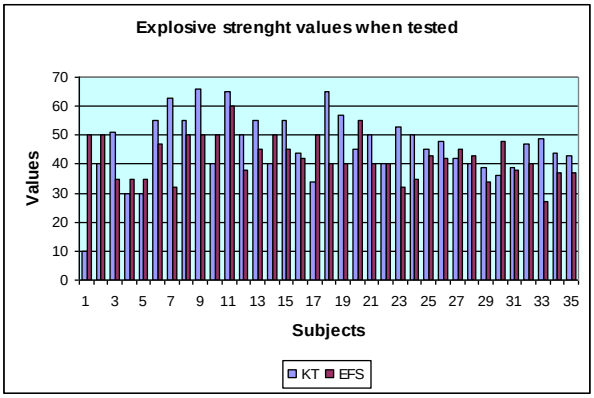

Figure 3. explosive force.

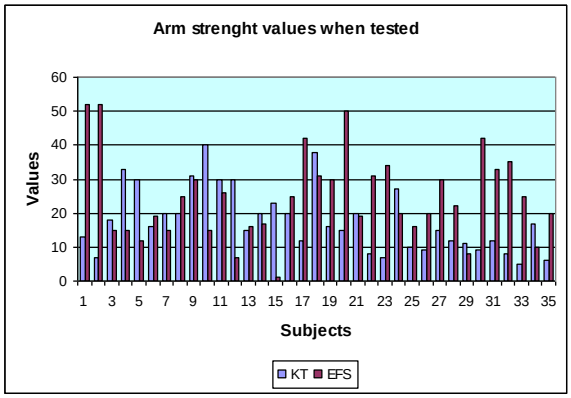

Figure 4 force arms

Discussion and conclusions

The purpose of this study is to be able to determine the methods, means, methodical, the quality of driving force.

Regarding the values obtained from ***testing abdominal*** strength, the minimum (4) is obtained by the students of the specialization KT, the maximum is the same for all students participating in the experiment (32).

Arithmetic average testing ***abdominal strength*** is higher in students at KT specialization, the students compared the EFS.

When testing ***back strength***, maximum value (46) is obtained by specialization students EFS, and the minimum value (16) is obtained by KT specialization students.

Arithmetic average ***back strength*** testing is higher EFS students from specialization, the students compared to KT.

In terms of ***explosive strength*** values when tested, both values (maximum - minimum 66 and - 10) are obtained by students at KT specialization. Arithmetic mean is greater ***explosive strength*** testing to students at KT specialization, the students compared the EFS.

When testing ***arm strength***, so the maximum value (52) and the minimum (1) is obtained by EFS specialization students.

Average ***arm strength*** test results is higher than students in the specialization EFS students from KT.

High values of standard deviation of results obtained by students from both specialization highlights their lack of homogeneity.

The overall results obtained show the need to develop, maintain, improve labor methods, specific means.

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STUDY CONCERNING THE INFLUENCE OF PHYSICAL EDUCATION IN THE DEVELOPMENT OF THE MOTOR POTENTIAL LEVEL AT STUDENTS

VAIDA MARIUS[1]

Abstract

Purpose. This study is meant to complement various previous researches and its main purpose is to determine the motor potential of students, boys and girls, knowing that the age involved is represented by numerous changes in terms of psycho-motor skills and also demonstrating that physical education and sports, through its specific activity, may influence the development of these skills even into adulthood.

Subjects and methods used. This study was conducted on a sample of 200 students (100 boys and 100 girls) in the academic years 2009/2010 and 2010/2011 and the place of the experiment was the Petroleum and Gas University from Ploiesti. The motor manifestation tests were conducted at the beginning of year I and II.

The data was recorded, centralized, processed and interpreted statistically using the following methods: observation, bibliographic study method, measurement and recording method, experimental method, statistical and mathematical method and graphic method. Motor indicators targeted in this study were: speed run on the distance of 50 m, pull-ups – at boys, abdominal muscles strength at girls, standing long jump and with take-off, back muscle strength, resistance running - 1000 m boys and 500 m girls and throwing the oina ball.

Results. Processing the statistical interpretation of data we observe in the second experiment an increase more or less significant in most parameters investigated both for boys and girls, except the resistance run for the girls where the mean value remained unchanged.

Conclusions. Taking the obtained results as a whole we can also say that the age we refer to in this study, namely the student age, physical condition can be improved by attending an organized instructive-educational process,

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Email: vaidamarius@yahoo.com
Received 11.05.2012 / Accepted 13.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

this bilateral process having an important role by engaging students in permanent, organized sports activities. By knowing the psycho-motor potential of students, we can establish some indicators applicable in the university physical education and also an effective targeting of specific means and methods used.

Key words: physical education, development, motor potential, students

Introduction

This study is meant to complement various previous research and its main purpose is to determine the motor potential of students, boys and girls, knowing that the age involved is represented by numerous changes in terms of psycho-motor skills and also demonstrating that physical education and sports, through its specific activity, may influence the development of these skills even into adulthood.

I also believe it is important to know the actual level of youth enrolled at the university in terms of their motor potential and if there is an evolution or involution in the second year of college, based on a curriculum aimed at developing the motor skills.

The development of the human body is divided into three periods, namely: growth and development, the period of maturity and involution period (early involution), this study refers to the period of growth and development, knowing that this period is about 21-23 years age range that fits most of the students from study year I and II in higher education, and of course there are subjects which have reached the maturity period (M. Ifrim, 1986).

In the specialty literature the age notion has different meanings, being confusing regarding the clear delimitation of age even for teachers.

Chronological age is defined as "the age determined by the number of years, months and days of life" (R. Manno, 1996), whereas the biological age involves "assessing the individual features of each athlete or of those who deviate from the general features of the age "(E.D. Colibaba, I. Bota, 1998), through which the degree of maturity of the individual can be assessed.

Also, the psychological age is understood as the amount of experience and maturity, based on the child's self image, the subjective reactions as well as his individual adaptability (Bocher, 1969, quoted by C. Bota, 2000).

However, social age is the kind of age which is influenced by the structure of society. (Bocher, 1969, quoted by C. Bota,, 2000) and working age is actually the real age, this age consisting of those listed above.

Bota, C. (2000) considered that in the period between 18-20 years and 30 years, an untrained adult is manifested by a relative preservation of motor performance capacity, the same author pointing out that some regressions may occur such as to the motor quality-speed.

University continues the instructive-educational process of pre-university education, and has to fulfill certain goals, among which an increase in the physical condition level of manifestation. In order to achieve the objectives specific to the stage we consider it crucial to determine as accurately as possible the development level of motor capabilities helping us to get an idea of the means and methods that can be used in relation to the actual development level of students.

Used materials and methods

This study was conducted on a sample of 200 students (100 boys and 100 girls) in the academic years 2009/2010 and 2010/2011 and the place of the experiment was the Petroleum and Gas University from Ploiesti. The motor manifestation tests were conducted at the beginning of year I and II.

The data was recorded, centralized, processed and interpreted statistically using the following methods: observation, bibliographic study method, measurement and recording method, experimental method, statistical and mathematical method and graphic method.

In the statistical processing we used the following indicators: weighted arithmetic mean, median, upper limit (x_{max}), the lower limit (x_{min}), quartiles - are those characteristic values that divide the series into four equal parts, the amplitude (W), deviation mean square (S), coefficient of variation (Cv).

The obtained data in the two years was compared and could highlight the obtained dynamic results and trends manifested from a motor point of view both at boys and girls.

The motor indicators that were targeted in this study were: the distance speed run of 50 m, pull-ups at boys and abdominal muscles strength at girls, standing long jump and with take off, force back muscles, resistance run - 1000 m boys and 500 m girls and throwing the oina ball.

The obtained results and their interpretation

The data obtained from the registration, centralization, processing and statistical interpretation of the seven tasks subjected to the experiment are presented in tables 1-4, tables 1 and 2 represent the data collected from boys in the first and second year, tables 3 and 4 showing statistical results at the seven samples that targeted girls in the two years.

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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Table 1. The calculated statistical values of the motor indicators – boys – year I

Boys	Year I						
	Speed 50m	Pull-up	Standing long jump	Long Jump with take off	Back	Resistance 1000 m	Oina
Arithmetic mean	7,21	7,3	2,25	4,43	30,95	4,20	47,7
Minimum	6,3	1	1,9	3,85	13	3,42	36
Maximum	8,7	20	2,5	5,46	64	5,15	58
Amplitude	2,4	19	0,6	1,61	51	1,73	22
Median	7,05	7,5	2,25	4,35	29,5	4,18	48,5
Lower quartile	6,8	3	2,2	4,00	21,75	4,01	41,75
Upper quartile	7,7	10	2,3625	4,6875	36,25	4,36	55
Standard deviation	0,62	4,75	0,15	0,45	12,81	26,01	6,92
Coefficient of variability	8,60	65,03	6,44	10,23	41,38	9,98	14,51

Table 2. The calculated statistical values of the motor indicators – boys – year II

Boys	Year II						
	Speed 50m	Pull-up	Standing long jump	Long Jump with take off	Back	Resistance 1000 m.	Oina
Arithmetic mean	7,17	7,85	2,29	4,51	33,10	4,19	49,43
Minimum	6,3	3	2	3,91	18	3,41	37,5
Maximum	8,3	21	2,51	5,5	66	5,1	59
Amplitude	2	18	0,51	1,59	48	1,69	21,5
Median	7	8,5	2,3	4,46	31,5	4,17	49,5
Lower quartile	6,8	4	2,195	4,12	23,75	3,58	44,75
Upper quartile	7,725	9,5	2,375	4,73	37,25	4,36	55,25
Standard deviation	0,55	4,49	0,15	0,42	12,24	26,48	6,42
Coefficient of variability	7,72	57,16	6,51	9,27	36,97	10,21	12,99

The data presented in tables 1 and 2, which shows the values obtained from seven tasks at boys in the two years we can conclude that all seven samples tested were superior in the second year compared with the ones since year I. At the speed test on 50 m distance in the first year the average was of 7.21 sec. compared to the average result from year II of 7.17 sec., the progress being of 0 "04. The pull-up test, in the first year the boys made a mean of 7.30 pull-ups, and in the second year the average was of 7.85, the progress being of 0.55 pull-ups.

In the long jump case, in the first year, the average was of 2.25 m and of 2.29 m in year two, the progress being of 4 cm., this growing tendency being noticed at the long jump with take off, the first year being characterized by an average of 4.43 m compared with 4.51 m realized in the second year, the evolution of students results being in average superior by 8 cm.

Referring at the back muscle strength we can see that the results from the second year are superior with 2.15 raises in comparison with the first year, in the first year the average was of 30.95 compared with 33.10 lifting done in the second year. The resistance run on a distance of 1000 m is characterized by a relatively small improvement in average, the difference between those two years was only 1 second (4.20 sec in the first year and 4.19 in year II).

Also, throwing the oina ball keeps the tendency of other tasks presented above, the difference between those two years is quite significant, the progress being of 1.73 m (47.7 m in the first year compared to 49.43 m in the second).

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
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In the first year can be seen that the degree of homogeneity of the group is high at the speed running, at the standing long jump and resistance run, it is medium at the long jump and throwing the oina ball and weak pull-ups and back muscle strength. In the second year is observed that the degree of homogeneity of the group is high at the speed running, standing long jump and with take off, it is average at the resistance run and throwing the oina ball and weak at the pull-ups and back muscles strength.

Table 3. The calculated statistical values of the motor indicators – girls – year I

Girls	Year I						
	Speed 50m	Pull-up	Standing long jump	Long Jump with take off	Back	Resistance 1000 m.	Oina
Arithmetic mean	8,64	25,6	1,69	3,21	24,60	2,43	23,35
Minimum	7,8	8	1,3	2,5	9	2,15	16
Maximum	10	52	2	3,92	51	3,1	33
Amplitude	2,2	44	0,7	1,42	42	0,95	17
Median	8,6	23	1,71	3,31	23,5	2,34	22
Lower quartile	8,1	19,25	1,5375	2,88	18,5	2,32	18,75
Upper quartile	9,05	32,5	1,805	3,5125	29	2,5	27,5
Standard deviation	0,63	10,58	0,19	0,43	10,27	0,24	5,40
Coefficient of variability	7,30	41,31	11,43	13,48	41,74	10,08	23,14

Table 4. The calculated statistical values of the motor indicators – girls – year II

Girls	Year II						
	Speed 50m	Pull-up	Standing long jump	Long Jump with take off	Back	Resistance 1000 m.	Oina
Arithmetic mean	8,63	27,25	1,71	3,25	24,85	2,43	24,20
Minimum	7,76	12	1,36	2,51	10	2,19	15
Maximum	10,20	53	2,03	3,96	53	3,08	36
Amplitude	2,44	41	0,67	1,45	43	0,89	21
Median	8,54	23,5	1,715	3,28	23	2,36	23
Lower quartile	8,11	19,75	1,55	2,89	19,50	2,31	20,50
Upper quartile	8,96	35,25	1,85	3,52	28,25	2,48	28,50
Standard deviation	0,64	10,42	0,20	0,43	10,04	0,24	6,02
Coefficient of variability	7,42	38,25	11,45	13,13	40,40	9,98	24,89

Tables 3 and 4 show the statistical calculated values of the seven tasks for the girls, the tendency being as the one at boys, a tendency of progress in the second year, except the resistance run where we notice a stagnation.

The progress in the 50 m speed run in girls is relatively small (0 "01 sec.), the values of the mean being of 8.64 sec. in the first year and 8.63 sec. in the second one. At the task in which it was tested the abdominal muscle strength a progress of 1.65 lifts can be noticed, the means values being of 25.6 lifts in the first year and 27.25 lifts in the second year.

Also, the long jump from standing is manifested by an improvement in the average, in the first year the mean being of 1.69 m and 1.71 m in year two, the progress being of 2 cm., this growth tendency being seen also in the long jump with take off, the first year being characterized by an average of 3.21 m compared with 3.25 m realized in the second year, the evolution of the average being of 4 cm.

The task through which we tested the back musculature strength shows us a very low progress in the second year, the increase of the mean being only of 0,25 lifting (24,60 lifting in the first year compared with 24,85 lifting in the second year).

The resistance run over distance of 500 m is characterized by a stagnation of the average, the mean values being of 2.43 min. both in the first year and second year. As for throwing the oina ball, the tendency of progress is seen in the second year, the difference from the first year being of 0.85 m (23.35 m in the first year and 24.20 in the second).

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
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In girls, in the first year it can be seen that the degree of homogeneity of the group is high at the speed run, is average at the standing long jump, long jump with take off and resistance run, and weak at the abdominal musculature strength, back muscle strength and throwing back the oina. In the second year we observed that the degree of homogeneity of the group is high in the speed run and resistance run, average at the standing long jump and the one with take off, and weak at the abdominal muscles strength, back muscle strength and throwing the oina ball.

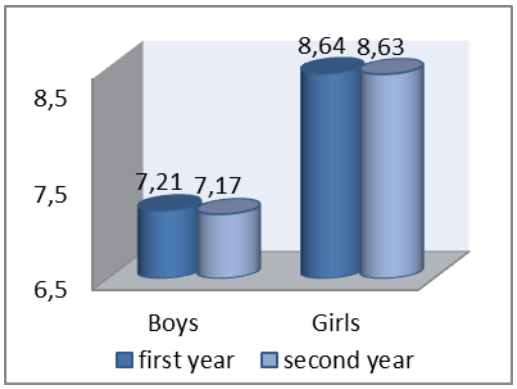

Figure 1. Medium values of speed run over 50 m

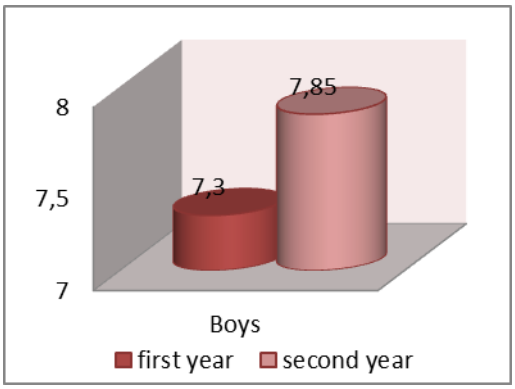

Figure 2. Medium values at the pull-ups

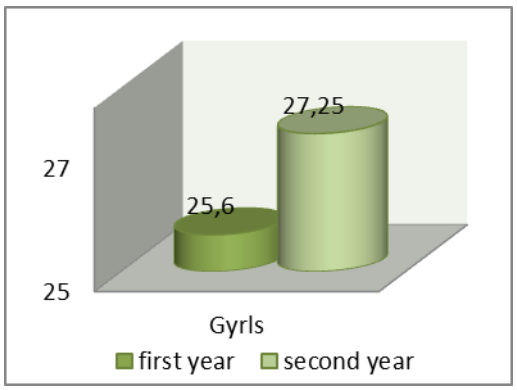

Figure 3. The medium values of the abdominal musculature strength

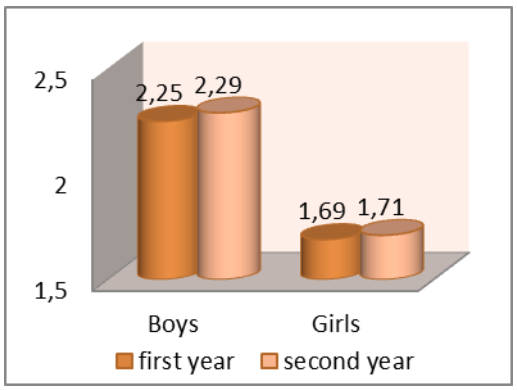

Figure 4. The medium values of the long jump from standing

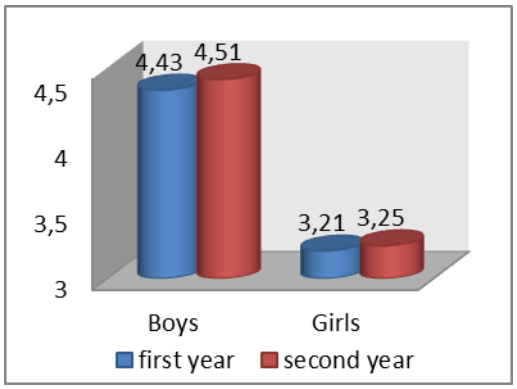

Figure 5. Medium values of the long jump with take off

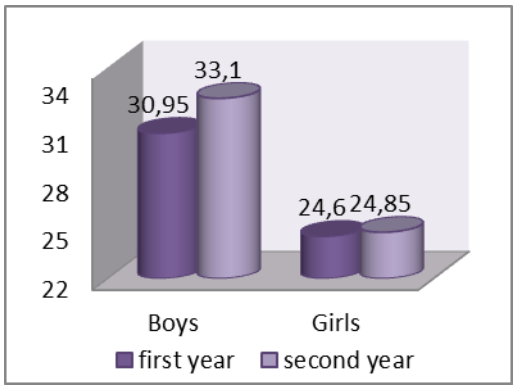

Figure 6. Medium values of the back musculature strength

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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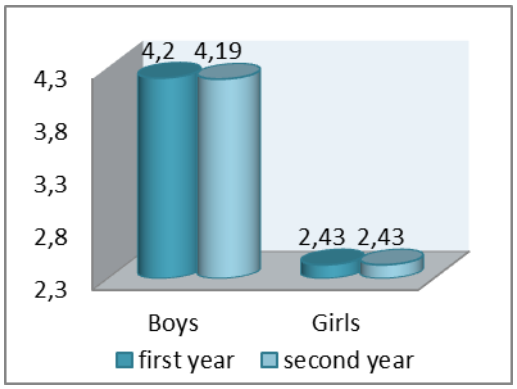

Figure 7. Medium values of the resistance run

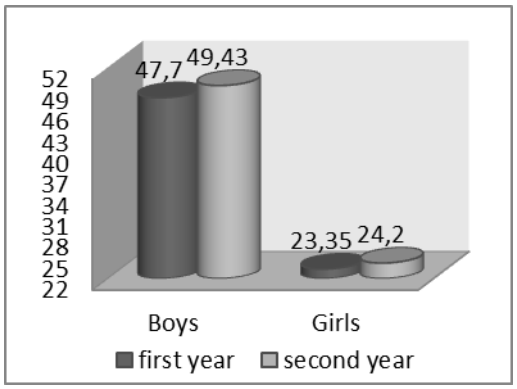

Figure 8, Medium values of throwing the oina ball

In order to point out the progress or the means stagnation, there were presented graphically in figures 1-8 the differences of the means in the two years of the experiment, on tasks, both at boys and girls.

Conclusions

Synthesizing the data obtained from the experiment we can say that the physical education has a proven role in the motor potential development at students, even if at some tasks the progress made was not very high or has even recorded a stagnation of the results.

Of the seven motor indicators tested we determine that the most significant progress was recorded in the abdominal muscle strength – girls, long jump with take off in both sexes, standing long jump and throwing the oina ball in boys, with the remaining tasks having a lower progress, and at the resistance run even a stagnation of the results in girls being recorded.

Taking the overall obtained results we can say that also at the age we refer in this study, namely, student age, the physical condition can be improved by attending an organized instructive - educational process, this bilateral process having an important role by engaging students in organized permanent sport activities.

Physical education activity, besides increasing the biological potential of young people has a more complex role, to achieve a development of bio-psycho-motor predictions with the finality of a state of optimal health maintenance, the knowledge of psychomotor potential of students helping us to establish some indicators which apply in university physical education and the effective targeting of specific means and methods used to develop the reminded potential.

From the collected and processed data results that the motor level of students at entering the university education is a medium one, certain qualities being able to develop in a better way than others.

As a last conclusion I wish to draw the attention to maintain the physical education in higher education, even as a compulsory subject in at least the first two years of study, this is reflected by maintaining and improving the health of the young generation, by its biological potential development, the respective process unfolding in an organized framework under the guidance of experts, knowing that the youngergeneration has other concerns at the age when we refer to, only a small part heading to movement or sport

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

❖ KINETOTHERAPY

MOTOR ACTIVITY IN WATER AND FINE-LUBINSKY SYNDROME

BIANCALANA VINCENZO[1], SCARPA STEFANO[2], NART ALESSANDRA[3]

Abstract
Purpose. Improve motor function by exercise in the pool.
Methods. In general, there are two approaches used to study mechanical aspects of human movement: quantitative approach & qualitative approach.
Results. There was significant differences between professional swimmers and beginners movement including: breathing pattern, hand drag and stroke, fingers distances, angle of elbow and knee flexion.
Conclusions. These results have to be taken into account by coaches in order to better understand of biomechanical concepts for technical effects of training.
Key words: Water, motor activity.

Introduction

Fine-Lubinsky syndrome was described in 1993, as a very rare syndrome which entails craniofacial anomalies, bilateral hearing loss, cataract, microstomia (small mouth), central nervous system abnormalities and psychomotor delay. (P.Cole et al. 2009).

Unusual abnormalities include brachydactyly*, camptodactyly* and anomalies of the deciduous dentition. The conditions that contributed to the onset of the pathology in this specific case, are genetic recessive.

The article is about a series of water activities suggested to a 35 year old woman, aimed to improve balance, maintenance of praxis schemes, strengthen abdominal muscles, increased mobility of the lumbar tract of the spinal column, pragmatic competence and development of intentionality.

Clinical Case

The diagnostic process included a series of examinations and assessments, such as, audiometric hearing test, which results in severe bilateral perceptive hearing loss between the frequency of 55-4000 Hz. (hearing aid was fitted at the age of 6). Internist medical examination, ophthalmology check, which results in posterior polar cataract (bilateral excision surgery with the result of fair residual eyesight), otolaryngology and neurological examination, metabolic tests, high-resolution karyotype (46 normal xx), neuropsychiatric, psychological, psychomotor and speech assessments, nephrology evaluation, orthognathic evaluation (3rd class Angle, mastication deficiency).
The latest assessment of the level of adaptive behaviour, carried out by interviewing the parents, using the Vineland Scale, shows a deviation IQ of 425, with values below average, as regards to communication and socialization. In these areas the woman had achieved a score equivalent to a child aged 1-8 years old. It occurred, however, that values were within average as regards to motor skills, and above average as regards to daily activities, areas in which she achieved a score equivalent to a 3-10 year old.
The eye-hand coordination, the fine motor skills and imitative processes, were particularly good.
(JR.Corona-Rivera et al. 2009)
On the other hand, she has great difficulties in the area of cognitive development, perception and speech proficiency. The attentive ability is also compromised and this greatly lengthens the learning process.This series of assessments brings out a clear set of symptoms attributable to the Fine-Lubinsky syndrome, which is followed by a 100% disability certification.

Activity in water

The summer* activity proposal, to be performed in the swimming pool, lasted one hour, and it was carried out every week day. Pina always showed interest and had enthusiasm to take part in the work and was very willing to follow the instructions she was given.
The exercises, so aimed to improve her motor skills, her fitness level, and help her release the stress built up, because of her hyperactivity. It also focused on improving her communication skills outside of the family environment, in prospect of the "after us" project, which that her parents hold so dear.
For this reason, the communicative interaction with the girl took on a definite connotation of affability and warmth, everytime she arrived at the Centre, to continue until the moment she entered the swimming

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Received 11.03.2012 / Accepted 02.05.2012

pool and beyond. Usually the greeting stage included, a wave saying "hello Pina", a hug, a kiss, the request for a kiss and the message "you are beautiful".

This way, Pina felt reassured and ready to tackle the task with great serenity, feeling more inclined to the communicative exchange. It must be said however, that since the very beginning, she showed as being particularly fond of her educator, and thanks to the L.I.S. (Italian Sign Language) they immediately established a very good relationship.

It is clear that, the whole motor skill intervention was designed within the natural conjugation of the basic and essential concept of *systemic* intervention.

In other words, it is not possible to just know or acknowledge a specific disability, to study an intervention for it, to choose a method, appropriate tools and the necessary times. If, such interventions, methods, tools and times, are not interconnected with the life, space and time, that the person is living in, *without* us.

The *systemic* logic that controls the adaptive process, compels the total awareness that, there *cannot* be places for intervention, which can be separated and disconnected.

Within this system, there are no separate "rooms", where the speech therapist, or the psychomotrist, rather than the physiotherapist or the psychologist, the teacher or the rehabilitator, embrace and put forward their methodological, emotional and relational language. There is instead one only "room", where all the operators speak the same language and pursue the same goal, which is to achieve the highest degree of self-sufficiency for the individual with the disability. But there is even more. The systemic logic, responding to its intrinsic need for an overall intervention, cannot prescind from gathering information relative to the different contexts and circumstances that revolve around the individual, outside her therapeutic time, such as family, school and leisure time. The main activities identified by our intervention in water, are listed below:

improved balance, maintenance of praxis schemes, strengthening of abdominal muscles, increased mobility of the lumbar tract of the spinal column, pragmatic competence and development of Pina's intentionality**.

*During the winter time, Pina attends lots of classes, such as, Pet-therapy with "Cane Corso", Hippotherapy, Occupational Therapy, Information Technology, Physiotherapy, Speech Therapy and Augmentative Communication, also Social Integration, Music Laboratory and Activity in water.

Generally the girl has a very good relation with water, she prefers the swimming pool, rather than the sea, being a closed environment, less dispersive, so therefore more predictable. She is able to swim in deep water too, the pool where we exercised, has a maximum height of 2,5 metres. She is able to dip her head completely under the water, sometimes this occurs accidentally, some other times voluntarily, in order to go from one lane to another, or to dive. She can also handle with confidence the presence of other people in the swimming pool, like children for example.

From the technical point of view, Pina holds a swim with her head out of the water, the legs hold the spontaneous movement typical of the breaststroke leg, the feet naturally remain in the hammer position, this is also due to a stiffness of the joints of the foot, which is caused by the syndrome. The movement of the lower limbs although, is alternate and not simultaneous and the traction movement of the arms is asymmetrical. So, while the right arm simulates the digging action backward and low, the left arm just performs a compensation motion. The asymmetry of her movement, is more evident when she has to carry teaching aids.

The workout stage

The activity was divided into three stages.

- *initial phase of access to the water and warm up*, this is the stage when Pina goes into the water and gets used to its temperature, walking along the perimeter of the pool, where the maximum height is 1,5 metres. Using floating aid items, such as a board or a tube.

The workout begins when Pina, sitting on a chair next to her educator, waits for a gesture that tells her she can enter the water (abidance of the waiting times).

Once given the signal to go into the pool, the warm up stage begins, by the gesture "look into my eyes", aimed to draw her attention, then the sign to "get the floating tube" or "the floating tablet" and the invitation, always through a sign, to walk around the swimming pool.

At the end of this first round around the pool, Pina returns the floating aid, and this action is followed by a sign of approval (applause) that makes her understand she has been good. After a few minutes (again, abidance of the waiting times) the educator will hand in another teaching aid, that will be used for another round around the pool.

- *central phase of focused workout*, this is the stage when targeted excercises are performed. They are established, based on the level of intensity, the most difficult ones are usually performed halfway through the activity, when Pina has the highest concentration.

Another important aspect to be taken into account, when planning the activity, is the tendency of Pina to store all information schematically, turning everything into a "routine". For this reason, it is important to break the patterns of excercises every so often, and set some kind of unpredictability, in order to prevent from doing the same sequence of excercises all the times.

**The reference is to the perturbing intentionality towards the surrounding environment. Such latter aspect is indeed vital, for the purpose of personal individual growth, from many points of view.

The child who perturbs, changes and modifies the environment around her, is a curious child, willing to get involved, to acquire different life experiences

without having fear of failure, to give in order to receive, and to ultimately carry out a lot of sensorimotor experiences, that will be the foundation of her cognitive development, both intellectual and more specifically physically.
The exercises performed are:
- Free-style swim (on her own or joined by her educator).
- Swimming with the aid of floating items, such as a tube, a board, one or two skittles, a ball, one or two medium sized ball in each hand, one or two tennis ball in one's hand, or in pairs with the watercircuit.
- To recuperate one or more teaching aids, thrown randomly at the bottom of the pool, using both hands and feet.
- Going underneath the watercircuit (when there are no lanes).
- Diving from the side of the pool and plunge to recuperate a teaching aid.
- Free-style swim back and forth, along the pool.
- Throws with the a ball.
- Proprioception exercises of the hands, with a big ball.
For all the exercises, the same procedure has to be followed.
Before the exercise begins:
- sign language "look into my eyes"
- sign for "take"
- sign for the teaching aid, that we are going to use, or for the action to be carried out
- sign for which direction has to be taken
At the end of the workout:
- sign for "hand me in, the teaching aid"
- sign for "you have been good"
- I caress her
- sign for "wait"
- *final phase of relaxation*, this is a stage in which Pina swims using the floating tube, following the perimeter of the pool. Once she has swum all around the pool, she follows the sign for "stop" which indicates the end of the activity. Pina approaches the swimming pool tiny ladder and gets out of the water.
In addition to performing the exercises, we also made some observations as regards to Pina's swimming speed and her heart rate range.
Speed: 30 tanks per hour. The full length of the pool is about 20/25 metres.
Heart rate range: never exceeds 130 bpm. She has fast recovery time, the range of usual workout is comprised between 110 and 120 bpm.
Apnea: 8 seconds. This is the maximum time for apnea observed, during the workout.
In regards to the teacher's presence during the activity, it starts by following Pina from the pool side and then, after about half an hour, he enters the water with her, both to swim together (exercise with the watercircuit) and also to carry out the playing exercises with the ball. At the beginning, and for a long period of time, the educator used to stay outside along the side of the pool, while Pina was performing the activity in the water. But during the last period, he used to go into the water too, and Pina seemed to appreciate that a lot.
She actually asked for his presence in the water, by specific requests, thus revealing a clear sign that Pina's communicative intentionality was starting to take shape.

The exercises of the intermediate stage

At the beginning, the free-style swimming and swim across the lane, were the exercises that Pina found more difficult and less entertaining, as she had to do it without any help or teaching aids. In fact, she was starting to scream, to be agitated, to bite and flap her hands in the water. Whereas now, one can see remarkable improvements, as she remains calm and seems to be a lot less irritable.
Swimming using the tube and the board, are considered as warm up and relaxation exercises, because Pina does actually relax when using such aids.
Therefore, such exercises can be very useful for those times when she lacks in concentration or is particularly nervous, in order to continue safely the activity. She uses these items to stay above the water, but still continues to drive the action, both with her legs and her right arm.
Pina considers, swimming with one or two objects in one's hand (that can be, skittles, tennis balls, medium size balls, larger balls, etc.) as a game. But technically, by performing such exercises she strengthens a lot her lower limbs. She does not even show any sign of fatigue, proving instead a fantastic ability to swim, just using her legs. When she has to carry along the large ball, she uses a technique which is similar to that of water polo, i.e. she points the ball in the desired direction, by hitting it with her hands, with small strokes. That is why, also when using other teaching aids, for example skittles or tiny balls, it is not necessary to use specific signs to let her do the exercise, one just needs to give her the items and point her which direction to take.

Swimming in pairs using the watercircuit, is useful to strengthen Pina's legs and to improve her technique. During the performance of this exercise, in fact, we realized that, when Pina has her grip on one object held steady, there is no involuntary movements "*sincinesie"* of the upper limbs, which would be caused by the propulsion of the lower limbs. So, it results a hint of simultaneous movement of the legs, which is very similar to the breast stroke swim.
At this point, it is possible to gather that, the alternating movements of the arms and legs, which are typical of Pina's swimming technique, are a consequence of the problems that she has with her left arm, used, in fact, for movements of compensation.
The exercise of recovering objects from the bottom of the pool, where the water is not deeper than 1,2 metres, was initially included, with the aim of teaching Pina how to plunge her head under the water.
But Pina did not appreciate such task, generally trying to cheat and get back the objects using her feet. Hence,

the idea to use this exercise to strengthen the abdominal muscles. So, in order to encourage Pina to carry out this recovery exercise, were used objects that she cares a lot for, such as for example her bracelets, or the ballasted circlets that are used for the swimming courses.

At the beginning she was annoyed, but afterward, being a fanatical about tidiness, she urged on picking up all the objects. Then, thanks to the exercises performed using the large ball and the use of goggles, Pina started to plunge her head also in the shallow water, and carried out this exercise in two different ways according to the requests, i.e. picking up the objects with her feet, without dipping the head into the water, or with her hands, thus diving into the water.

The sign language used to let her perform this exercise, is "to take".

In the recovery of one or more teaching aids thrown randomly into the pool, Pina obviously acts in different ways, according to the number of items, she has to pick up.

-1 object: she reaches out for the item to pick up, she grabs it with her left hand (Pina is left-handed, but when she swims she uses her left arm, as a compensation limb) and comes back to the side.

- 2 objects: she reaches the items to recover, she grabs the first one with her left hand and the second one with her right hand, then she comes back to the side of the pool, increasing the intensity of the activity of the lower limbs.

- more than two objects: Pina tends to collect all the items in a designated point in the pool, heading them all in the same direction, without grabbing them, but keeping her hands free all the times. By doing this, she demonstrates remarkable organisational skills.

The signs used to get her to perform the exercises, are the following,

- pointing at the direction of the objects
- sign "after"
- pointing at the direction to be taken, after the objects have been recovered.

One of the phases where Pina plunges her head into the water voluntarily, is when she passes under the watercircuit. This, in fact, being larger than the usual lanes, prolongs the diving time, and allows for a proper swim underwater. During this exercise the girl performs a phase of apnea lasting approximately 8 seconds. The sign language used to carry out this exercise is "below".

The dive from the side of the pool, is the second exercise in which Pina plunges her head into the water, even if sometimes this occurs unintentionally. This is done by sitting on the edge of the pool, hands joined in front of her face, she loses her balance and with a little push on her back she enters the water. During the underwater phase, Pina does not shut her eyes, and it seems like the water in her face is not bothering her, when she returns to the surface. Often, in addition to the dive, it is included the recovery of one or more objects, or a swim up to the opposite side of the pool, in order to complete the exercise.

- sign language for "diving"
- indicating her to get out of the water
- suggesting her to sit on the side of the pool
- repeating the sign for "diving".

The exercises of throwing the ball, were introduced to make the activity more varied and less predictable, and to improve the eye-hand coordination.

They are carried out in water, about 1 metre deep. Pina does not seem to have particularly difficulties in performing such exercises, although she does not always welcome such activity as a game.

The next step, will be to be able to catch the ball in midair, which is an exercise she already performs outside of the water. Such exercise has revealed to be very important for her parents too, so now they can play with her, also in the swimming pool.

This aspect is quite significant and totally unexpected. The sign language for performing such exercise has not yet been included in Pina's vocabulary, but it consists in imitating the throw of the ball with two hands, soon after pointing the direction, or the person, to whom she will have to throw the ball.

Proprioception exercises for the hands, are performed with the large ball, with the water up to the waistline. They consist in being able to keep the ball with both hands, underwater. The deeper the ball is, the higher is the level of intensity of the exercise. Initially Pina did not understand the purpose of this exercise, that is why she did not accept it.

But then, having slightly modified it, suggesting her to let the ball pass under her legs, or just under one leg, things have improved. She manages to push the ball underwater with both hands, but with just one hand, she still cannot control the movements of the ball and give it the right boost.

Another important achievement was, wearing the goggles. Pina is a very vain girl, she loves to put her make up on, wear lots of bracelets and necklaces, but she has always been wary in regards to wearing other type of objects. So, the educator put on the goggles himself first, and then, hoping that Pina would follow the imitative process, after about ten minutes, he tried to let Pina put them on. She did not complain or showed signs of dislike. As soon as she put them on, she was told "you are beautiful with your goggles on" and was reassured.

Thanks to the exercises with the watercircuit and the circlets, Pina is learning to plunge her head into the water, in order to find objects at the bottom of the pool. Moreover, of her own free will, while she swims, she plunges her head into the water for about 6 seconds, she breathes out underwater and resurfaces to inhale.

Diving her head into the water, greatly improves the structure of her body, facilitating the performance of movements.

Outcome

The benefits of motor activity in water, for a person affected by Fine-Lubinsky syndrome, are numerous. For greater expositive clearness, it was decided to separate and classify them, in two separate groups, i.e. the *immediate benefits* and the *long term benefits.*

Immediate benefits

General relaxation. Since this year, Pina has shown a remarkable improvement in regards to her attitude during downtimes, that is, when she is not busy doing any task.

Last year, soon after the activity in the swimming pool, she could relax on the couch for about 15-20 minutes, without showing any sign of impatience or frenzy. Such a long time of relaxation, was believed to be nearly impossible to achieve, during other times of the day.

- Muscolar and articular relaxation. On this purpose, looking at some pictures that portray Pina's hands and feet, before and after the activity in the swimming pool. It is evident a significant relaxation, especially of the hands, whereas such relaxation is less perceptible to the feet.

As previously described, the Fine-Lubinsky syndrome, among other things, also entails camptodactyly, that is, a permanent flexion deformity of the interphalangeal articulations. So therefore, the benefits relating to muscular and articular relaxation, are even more important for those individuals, in regard to the secondary prevention of camptodactilia.

Long- term benefits

- Increased muscle tone
- Improved balance
- Improved eye-hand coordination
- Improved of the physical structure, mostly thanks to the increased cutaneous somatoaesthetics stimulation.

-Decreased episodes of stress and anxiety, both as state of mind and trait. The reduction of anxiety is particulary noticeable by the almost vanished self-harming events. Such events, usually occurred when Pina was expressing annoyance or anxiety, biting her hands or pulling her hair. Also, to the improved management of waiting times, that previously she was unable to bear.

-Rise of the threshold of fear, of physical contact. The water if often used to break down the wall, in some individuals, which is represented by the fear of the physical contact with other people or objects.

Thanks to the numerous stimulations of the skin, that simulate a continuous contact with a foreign body, different from the individual.

- Improvement of intentionality. Pina started to express her wish and intentions. Often, during the past year activity, she specifically asked her father to get into the pool, to play with her. Such aspect, represents a great change in regards to her behaviour that, till then, had always been subjected to other people's decisions.

- Improvement of the exercises performance. All the exercises carried out during our activity, are now performed with more accuracy and serenity, so the quality of work has improved considerably. This is mainly due to a greater willingness to work in close collaboration.

- Weight loss. During the summer time, between July and September, the weight has dropped by more than 2 kgs.

These, are the priority works about studies conducted in Europe in recent years:

- Molecular genetic inestigation of apparently balanced translocations in patients with mental retardation and multiple congenital malformations**.**

Ghent University Hospital – UZGent - Belgio

Center for Medical Genetics-

-Development of novel DNA diagnostic technologies for the detection of structural chromosomal abnormalities in case of mental retardation (EFT 5467).

University of Tartu - Estonia

The Institute of Molecular and Cell Biology

- Cryptic anomalies by CGH array in children with mental retardation and ophtalmologic anomalies - CHU Paris Seine-Saint-Denis - Hôpital Jean Verdier –

Laboratoire de cytogénétique et biologie de la reproduction France ILE DE FRANCE – BONDY

- Identification of the molecular basis for unexplained mental retardation

Hopital Necker - Enfants Malades -

Département de génétique

France ILE DE FRANCE – BONDY

-Chromosomic errors and syndromic mental retardations

Hopital Necker - Enfants Malades - Département de génétique

France ILE DE FRANCE – BONDY

- NGFN plus : IG German Mental Retardation Network

- MR Centre Heidelberg (Project 9): Mutation screenings and functional characterisation on candidate genes

Universitätsklinikum Heidelberg

Abteilung Molekulare Humangenetik

Baden-Württemberg HEIDELBERG – Germany

- NGFN plus : IG German Mental Retardation Network

- MR Zentrum Tübingen (project 3): High resolution SNP microarrays for identification of genome imbalances and segmental UPD's. Molecular (MLPA, qPCR) and molecular cytogenetic (FISH) techniques for validation of Copy Number Variants.

Universitätsklinikum Tübingen

Medizinische Genetik Tübingen – Germany

- NGFN plus : IG German Mental Retardation Network

- MR Centre Erlangen (Project 1): Identification, validation and functional characterization of disease causing genes and proteines in patients with mental retardation of unkown cause

Friedrich-Alexander-Universität Erlangen-Nürnberg

Humangenetisches Institut – Germany

- BNE: BrainNet Europe II: European brain tissue bank
- Network for clinical neuroscience and basic research (coordination)
Ludwig-Maximilians-Universität München
Zentrum für Neuropathologie und Prionforschung
Bayern –MÜNCHEN - Germany

- NGFN plus : IG German Mental Retardation Network
- MR Centre Munich (project4): Genome-wide hybridization of genomic DNA with oligonucleotide-based arrays
Technische Universität München
Institut für Humangenetik Berlin - Germany
- NGFN plus : IG German Mental Retardation Network -MR Centre Berlin (Teilprojekt 2): Array CGH for detection of submicroscopic genome imbalances, homozygosity mapping using SNP arrays
Max-Planck-Institut für molekulare Genetik
Abteilung Human Molecular Genetics –Germany
- NGFN plus : IG German Mental Retardation Network
- MR Centre Bonn (Project 5): identification of candidate genes for mental retardation by the detection and analysis of submicroscopic CNCs Universität Bonn Nordrhein-Westfalen Institut für Humangenetik – Bonn –Germany Nordrhein-Westfalen
- NGFN plus : IG German Mental Retardation Network
- MR Centre Essen (Project 8): genotype phenotype correlations in patients with mental retardation
Universitätsklinikum Essen
Institut für Humangenetik –Nordrhein-Westfalen-Grmany

-NGFN plus : IG German Mental Retardation Network
- MR Centre Münster (Project 6): Identification of diseases causing genes in mental retardation
Universitätsklinikum Münster
Institut für Humangenetik - Germany
- NGFN plus : IG German Mental Retardation Network
- MR Centre Dresden (Project 7): Clinical characterization, molecular karyotyping and gentype phenotype correlations
Medizinische Fakultät Carl Gustav Carus der TU Dresden
Institut für Klinische Genetik
Sachsen DRESDEN - Germany
-Ricerca clinica sulle principali Sindromi associate a craniosinostosi
Azienda Sanitaria Ospedaliera O.I.R.M. - S. Anna - Struttura Semplice di Genetica
Università di Torino - Italy
- Utilità dell'array-CGH 244K nel riconoscimento di riarrangiamenti cromosomici criptici nel ritardo mentale e nell'autismo
IRCCS OASI Maria Santissima
U.O.C.di Pediatria e Genetica Medica Troina - Italy

- AGORA: Aetiologic research into Genetic and Occupational/environmental Risk factors for Anomalies in children
UMC St. Radboud - Universitair Medisch Centrum St. Radboud – NIJMEGEN
Afdeling Kinderurologie – Gelderland -PAESI BASSI
- AGORA: Aetiologic research into Genetic and Occupational/environmental Risk factors for Anomalies in children
UMC St. Radboud - Universitair Medisch Centrum St. Radboud
Afdeling Epidemiologie, Biostatistiek en HTA Gelderland NIJMEGEN- PAESI BASSI
- High definition genomic screening of candidate genes for neurodevelopmental disorders
Hospital Universitario La Fe (Campanar)
Unidad de Genética y Diagnóstic Prenatal
Valencya – Spagna
- NGFN plus : IG German Mental Retardation Network
- MR Centre Erlangen (Project 1): Identification, validation and functional characterization of disease causing genes and proteines in patients with mental retardation of unkown cause
Universität Zürich - Institut für Medizinische Genetik - Suisse
- Unbalanced chromosomal anomalies detection in patients with mental retardation and/or dysmorphism by CGH-Array (oligonucleotides chip - Agilent 244K): Geneva - Lausanne collaborative study
Centre Médical Universitaire - CMU
Laboratoire de Cytogénétique Conventionnelle-Geneve Suisse Romande
- Unbalanced chromosomal anomalies detection in patients with mental retardation and/or dysmorphism by CGH-Array (oligonucleotides chip - NimbleGen): Geneva - Lausanne collaborative study
Maternité, Centre Hospitalier Universitaire Vaudois (CHUV)
Laboratoire de Cytogénétique Constitutionnelle et Prénatale Suisse Romande – Lausanne - Suisse

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

IMPORTANCE OF INTRACEREBRAL HEMORRHAGE VOLUME OF AND MEDICAL AND KINETHOTERAPEUTIC TREATMENT

DOCU AXELERAD ANY

Abstract

Intracerebral hemorrhage (ICH) is the second most common cause of stroke, following ischemic stroke. It accounts for **8-13%** of all stroke cases . Its clinical importance derives from its **frequency** and high **mortality** (JP. Broderick, 2007). Although the latter is strongly dependent on hematoma size and to a lesser extent location, the overall mortality for this stroke subtype varies between **25% - 60 %.** Although we are assisting a new and highly established medical drugs and interventions in the field of modern medicine, ICH are unfortunately common in Neurology department in Constanta, Romania. Intracerebral hemorrhage will continue to be an important problem as the population ages in the world. Treatment is limited currently and is primarily supportive. Despite historically poor outcomes in ICH, there is considerable hope that the identification of factors involved in neurologic morbidity, early hemostasis, and removal of intracerebral hematomas will improve the short-term treatment of ICH. All patients with motor deficit benefit in our clinic kinethotherapy assistance in acute stage.

Key words: hemorrhage stroke, hemorrhage volume, kinethoterapy, prognostic.

Introduction:

Definition*: Intracerebral hemorrhage is focal bleeding from a blood vessel in the brain parenchyma that may extend to ventricles.*

Incidence: *Intracerebral* hemorrhage (ICH) is the second most common cause of stroke, following ischemic stroke. It accounts for **8-13%** of all stroke cases (JP. Broderick, 2007).

It is the **third leading cause** of death and the leading cause of disability in the US. In cases of cerebral hemorrhage, death results from extensive bleeding that causes increased pressure on the brain resulting in neurological damage (S.M. Davis, J.P Broderick, M. Hennerici, et. al, 2006).

Sites*:* Predilection sites for Intracerebral hemorrhage include the basal ganglia (40-50%), lobar regions (20-50%), thalamus (10-15%), pons (5-12%), cerebellum (5-10%), and other brainstem sites (1-5%).

Etiology*: The cause is usually hypertension. Other frequent causes are* Vascular malformations, Intracranial tumors, bleeding disorders, anticoagulant and fibrinolytic treatments, cerebral amyloid angiopathy(CAA) etc. (Shep Cooperative Research Group,1991, PB. Gorelick 1987, ISO H, JR. Jacobs Dr 1989).

Prognosis is generally poor after an intracerebral hemorrhage, although some patients can recover most function. Long-term mental and physical disability usually occurs.

Its clinical importance derives from its ***frequency*** *and high* ***mortality****. Although the latter is strongly dependent on hematoma size and to a lesser extent location, the overall mortality for this stroke subtype varies between* ***25% - 60 %.(4)***

Typical symptoms *;include focal neurologic deficits, often with abrupt onset of headache, nausea, and impairment of consciousness.*

Diagnosis *is by CT or MRI and other usual diagnostic tools.*

Treatment *;* Intracerebral hemorrhage is a severe condition requiring prompt medical attention. It may develop quickly into a life-threatening situation. Treatment *includes BP control and control of seizures, anticoagulation, supportive measures, and for some patients, surgical evacuation. Choice between Medical and Surgical Therapy should be carefully made. The role of kinetoterapy procedure is less known in principal the day of beginning of them.*

Complications *includes; Neurological deficits, Seizures* Hydrocephalus, Spasticity, Urinary complications ,Deep venous thrombosis (DVT),Pulmonary emboli, Cerebral herniation, Loss of cognitive function, Loss of movement of arm(s) or leg(s),dysphagia, dysphasia, vision loss etc.

Material and methods*: For statistical analysis of Intracerebral hemorrhage in order to know its prognosis and evolution, retrospective type of study has been chosen and done in Spitalul Judetean Constanta included all patient hospitalized between 01.01.2011-01.06.2011*

Results:

Incidence of ICH :

- *70 patients had developed ICH out of total 868*
- *patients admitted to Neurology department.*

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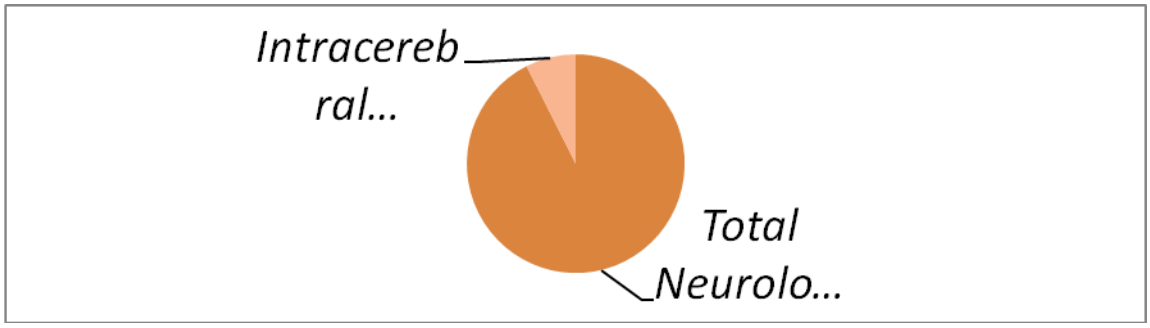
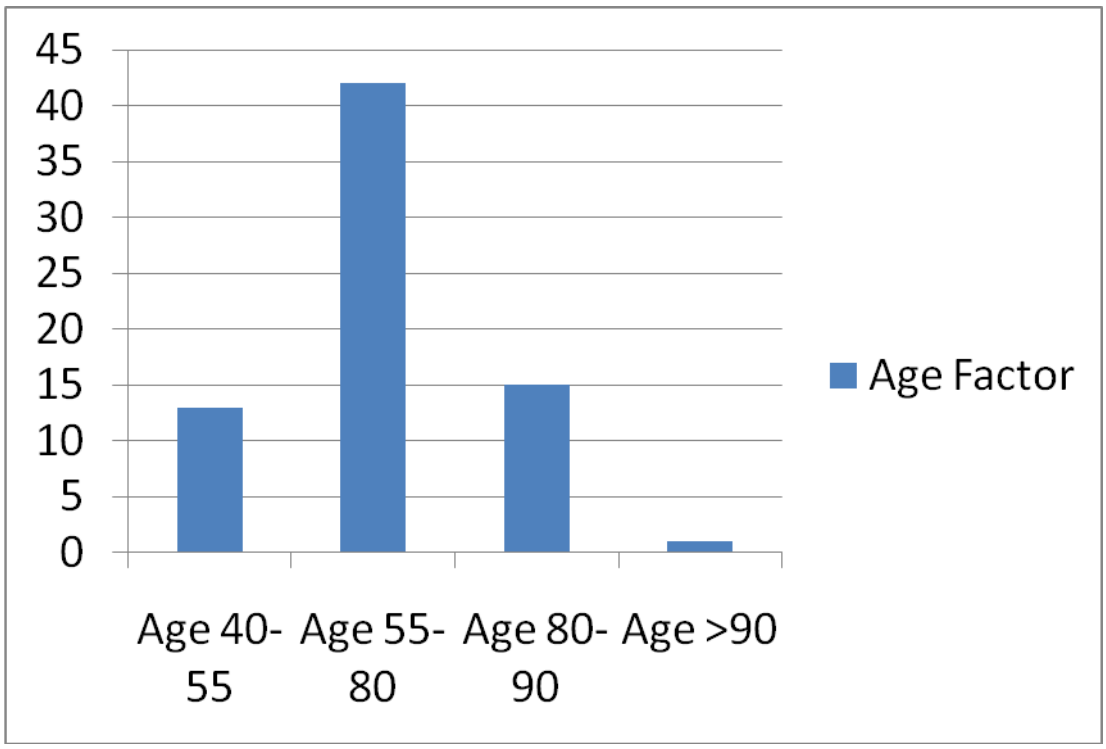
Received 12.03.2012 / Accepted 12.05.2012



- *The most frequent ages for Intracerebral Hemorrhage is between 55-80 years.*
- *High risk of ICH in old age.*



- *There is no sex difference in the incidence of ICH as it is quite balanced between two sexes.*

Males	Females
35 Patients	35 Patients

- Comparing urban with rural residency it is found that increased number of ICH patients are from countryside due to poor medical assistance.(57 % patients affected by ICH are from rural areas)
- **Different locations of Cranium are affected by ICH .The most common one is**
- Localization of ICH
  Subcortical regions of Brain including putaminal hemorrhages.

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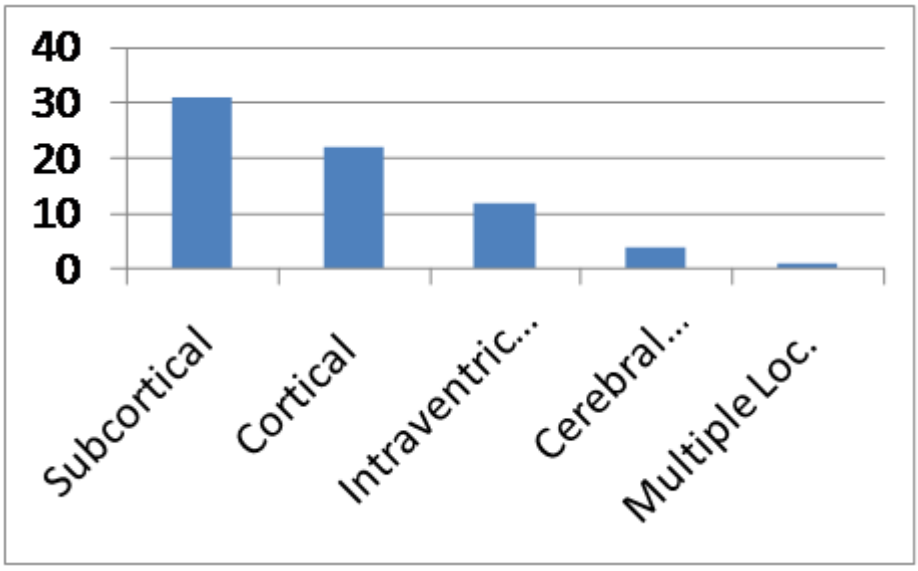


- As an average, patients of ICH have stayed for 2 weeks at hospital.
- Some patients either progress to death or received by their relatives due to worsening evolution and therefore duration of stay was not more than 1-7 days.

However some stayed for more than 2 weeks for treatment and control

Risk Factors

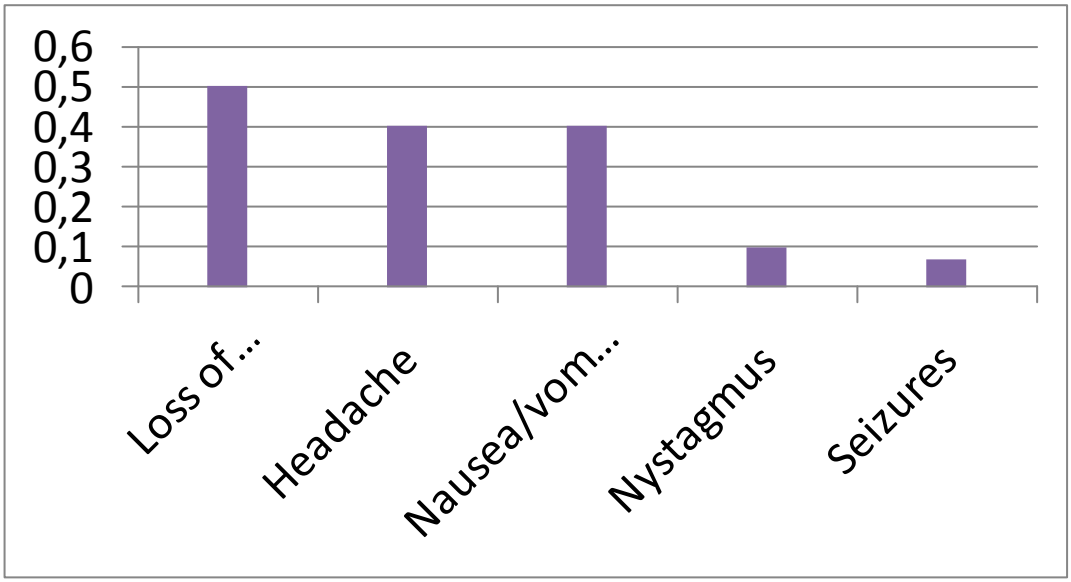
- *Hypertension:*

**HTN is the most known risk factor for ICH.*
**Hypertensive ICH most commonly occurs in nonlobar locations .*

**Out of 70 patients studied, 33 patients were having Hypertension grade II and grade III. 14 patients were having systolic blood pressure above 160mm-hg*

- Other risk factors:

Dislipidemia, Alcoholism, Diabetes mellitus, Obesity and Cardiopathy are other major risk factors for ICH.
Motives of Presentation to Hospital
All patients with ICH are symptomatic with sudden loss of consciousness or altered general state, persistent headache, vomiting and nystagmus. Some had seizures. Usually patients suffer from progression of neurological symptoms.



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Paraclinical Examinations :

CT scan give 90 % correct diagnosis. Other paraclinical tests include:

-HLG
-Glycemia
-ESR/Fibrinogen
-Biochemistry(AST/ ALT, Cholesterol , LDH etc.)
-Coagulation Profile(PT,APTT,INR)
-Urine analysis

Lab TESTS

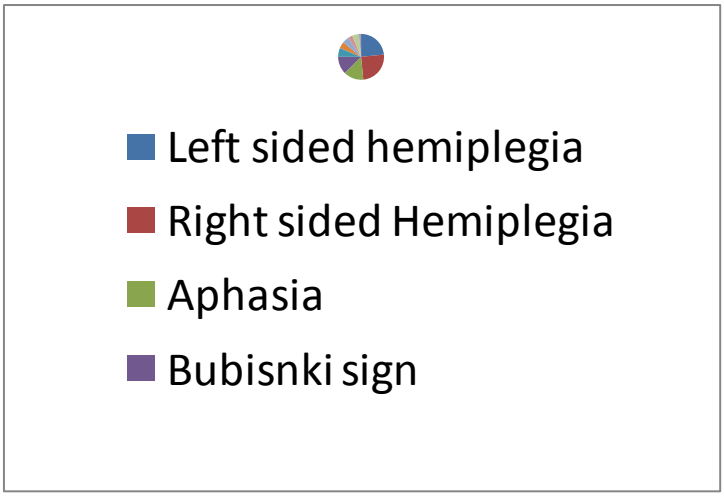
- *Almost all patients have some abnormalities in hemoleucogram.*
- *On Biochemistry examination LDH is usually elevated along with fibrinogen, CK and elevated ESR.*
- *Abnormal PT level is sometimes seen.*
- *Urine analysis showed usually normal results with exception of some patients with few blood, leucocytes and glucose in Urine.*
-

- Volume or dimension of hematoma on CT scan has the greatest value in prognosis and evolution of ICH but also to decide about the treatment plan
- Presence of IVH signifies high mortality and worse prognosis. Ventricular extension usually seen with Caudate, thalamic, large putaminal and large lobar hemorrhages.
- Presence of midline shift >5 mm is indication of surgical consultation.

Evolution

- *Overall evolution for ICH is not good as it has high mortality due to severe consequences and higher frequency due to HTN. Most of the patients die due to complications and worse prognostic factors. Patients who survive have following consequences or sequelae as observed:*

- ***Number of patients***



Medical Treatment

- All the patients who have ICH had medical treatment. Some undergo surgical removal too. According to theory, patients needed medical treatment with labetalol, nitroprusside or hydralazine for blood pressure control, Mannitol or osmotherapy for increase ICP, fluid management for hydroelectrical balance, phenytoin for prevention of seizures and also control of body temperature and other symptomatic treatments with Algocalmin Metoclopromide,Quamatel,Vit b complexes etc.

- Kinetotheraphy treatment

  Rehabilitation programme objectives: induce of voluntar motor activity; prevent wrong movement; prevent muscle retractures and joints diformities, decrease spasticity. Rehabilitation programme: we used physical programme for reduce pain, spasticity and also kinetic method for each objective. In each month we followed the evolution using specific scale assessment. We must say that during the acute period they did not came at rehabilitation programme.

Indications for treatment with medical drugs are:

- Hematoma < 10 cubic cm or with minimal neurological deficits

- Very good or very bad prognostic feature presence

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

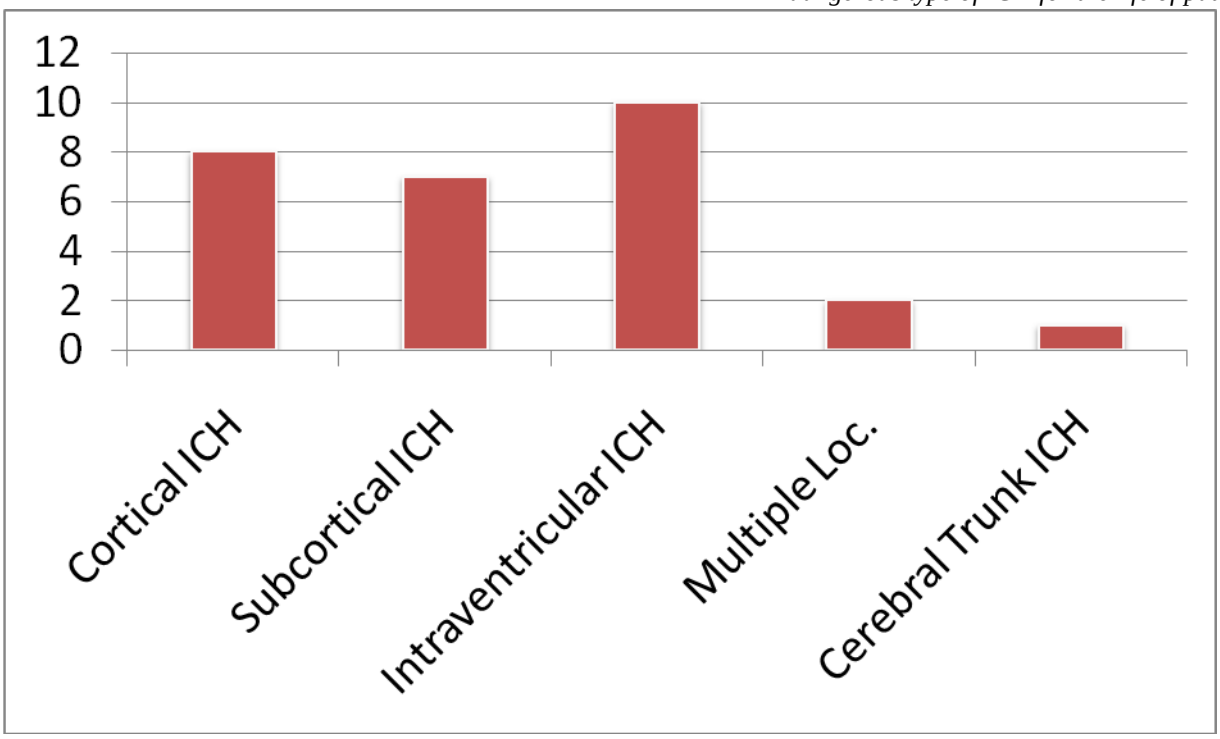
- Diverse hemorrhages with great neurological deficits or large lobar hemorrhages
- GCS <5 or GCS > 10
- Patients with intense coagulopathy or previous chronic disease
- Very old patients who cannot tolerate operation > 75 years
- Deep hemorrhages like Basal ganglia or thalamic hemorrhages
- Pons hematoma
- NEUROSURGICAL CASES(Only 6 cases 0ut of 70 needed neurosurgical consultation)

ICH is managed and treated by medical therapy in most cases however there are certain indications of neurosurgery:

* Progressive loss of consciousness
* Aneurysm , AVM or presence of tumor in Angiography
* >15 cubic cm in cerebral hemorrhage or > 3cm in cerebellar hemorrhage
* Midline shift or brain stem compression effect
* Obstructive Hydrocephaly
* Lobar and cerebellar hematoma
* Hematoma in nondominant hemisphere

Mortality Rates

- *ICH has high mortality outcome.*
- *Intraventricular hemorrhage is the most dangerous type of ICH for the life of patients.*



Mortality Factors

- Large volume of hematoma
- Intraventricular location of hematoma (2 fold increase in death)
- Associated disease and risk factor presence; like HTN
- Lower GCS (GCS less than 8 with 30 days of mortality rate)
- Presence of aneurysm
- Patient receiving oral anticoagulant therapy (OAT)
- Abnormal lab findings of cholesterol or blood glucose
- Previous history of Stroke
- Advanced ages (above 65 years)
- Poor Response of patients to medical or surgical treatments

Clinical Status at discharge of patients from Hospital

- There are large ratios of patients who get worse at the clinic due to failure of every intervention and then die due to development of complications usually within 2 days.
- ICH is a disabling syndrome, therefore patients at presentation with coma get better only with accurate control of HTN and ICP, however most of them develop consequences of ICH that remains throughout their life .

- Patient's clinical status can be: Ameliorated(27%),aggravated(33%),death(40 %).

Conclussions

- Although we are assisting a new and highly established medical drugs and interventions in the field of modern medicine, ICH are unfortunately common in Neurology department. It is the second most common cause of stroke, following ischemic stroke.
- HTN is the major risk factor, morbidity and mortality is increased with the size of hematoma, location of hematoma, ventricular extension presence, blood glucose level and advanced age. Also GCS score is important in evaluation of prognosis in patients with ICH.
- Evolution of patients with ICH is not good. Majority had Hemiplegia, aphasia, facial palsy and dysphagia. Death rates are high for IVHs.
- The best method of prevention of ICH is good control of HTN, careful follow up of cases and removal of risk factors and education of public with respect to risk of development of ICH.
- Intracerebral hemorrhage will continue to be an important problem as the population ages in the world. Treatment is limited currently and is primarily supportive. Despite historically poor outcomes in ICH, there is considerable hope that the identification of factors involved in neurologic morbidity, early hemostasis, and removal of intracerebral hematomas will improve the short-term treatment of ICH.
- All patient with stroke have hemiplegia, an for all we started a recuperation program in hospital in acute stroke with kinetotrapeut and we recommend for home a battery of exercise.

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PARKINSON`S DISEASE AND INFLUENCE OF MUSIC IN THEIR REHABILITATION

DOCU AXELERAD ANY[1]

Abstract

Psychomotor rehabilitation in parkinson disease

Parkinson disease (PD) is a progressive neurodegenerative disease characterized by bradykinesia, rigidity, resting tremor, gait disturbance, stooped posture, autonomic dysfunction and mental symptoms, such as dementia, delirium and depression. The available therapies for PD include pharmacologic management, rehabilitation and education. Exercise for patients with PD can improve primary and secondary symptoms and can be beneficial in all stages of PD. An exercise program should include aerobic exercise, stretching exercises and strengthening exercises. Twenty minutes of exercise three times a week is best. In addition, use of an external pacemaker, such as rhythmic sounds and music therapy, might be effective for improving gait disorder and motor performance in patients with PD. Patient education program provide a useful adjunct to medical therapy and are needed for early and middle disease stages in PD.

Key-words: progressive neurodegenerative disease, rehabilitation, patient physical education programs.

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Received 12.03.2012 / Accepted 12.05.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

Introduction

Parkinson `s disease (PD) is a progressive neurodegenerative disease characterized by bradikinesia, rigidity, resting tremor, gait disturbance, stooped posture, autonomic dysfunction and mental symptoms, such as dementia, delirium and depression. The available therapies for PD include pharmacologic management, rehabilitation and education. Exercise for patients with PD can improve primary and secondary symptoms and can be beneficial in all stages of PD. An exercise program should include aerobic exercise, stretching exercises and strengthening exercises. Twenty minutes of exercise three times a week is best. In addition, use of an external pacemaker, such as rhythmic sounds and music therapy, might be effective for improving gait disorder and motor performance in patients with PD. Patient education programs provide a useful adjunct to medical therapy and are needed for early and middle disease stages in PD.

It is a degenerative disease with familiar autosomal dominant transmission. In this disease the Black Substance is more affected due to unknown etiology and Globus Pallidus also affected.

Males are more affected than females. **Symptoms:**

1. Akinesia.
2. Hypertony /Rigidity.
3. Tremor.

1. Akinesia.The patient has difficulty in starting the movements. All the movements are slow. The automatic movements (balance of arms) are absent. The face is like a mask without expression. The blinking of the patient is rare. Walk is made by short shuffling steps. The position of the body during walk is like a " ? " (body, neck, legs and arms are flexed). The voice of the patient is slow and monotonous. Some verses (words) are repeated - Palylalia. The thinking process is slowed. The handwriting is small and illegible.

2. Hypertony /Rigidity The whole body is flexed like a " ? " due to rigidity.The rigidity is of plastic type.

"Pillow sing" positive - Head of patient remains elevated for along time after the pillow is removed. Expression of this rigidity is the "Cog-wheel" phenomenon or the "Noica" sing.

3.Tremor**:** It is an involuntary movement which usually affects the fingers, hands, head and the legs sometimes. It is a Static Tremor (during rest it appears and disappears during active movements). It appears during emotional states and disappears during sleep. It`s frequency is 4-7 / sec. This tremor has a typical aspect. It is an alternans b /w flexor and extensor muscles. Hence it appears as "Pill-rolling" movenment or in the hands and pedal movement in foot. Nodding movement of head and neck.

Tendon reflexes are normal.The patient has no motor deficit and no problem of sensitivity..The sweating of the skin is excessive. Salivation is also excessive. The Sebum production is in excess(greasy face). This patients has some psychic disturbances- the patient is selfish, with increased irritability bradypsychia and Dementia appears later.

In Parkinsons lesion predominantly affects the Black Substance and Globus Pallidus. The number of neurons in Black Substance at 30 years of age is 500.000 , at 80 is remains at 250.000. In pathological state it is 80.000. The levels of Dopamine is decreased.(Mano, 2003)

Evolution: It is longer than 10 years, after this the pacient is in bed needing assistance.(Docu, 2012)

Most treatments of Parkinson's disease (PD) are aimed at the reduction of motor and nonmotor symptoms but patients often report a deterioration of their daily lives. Thus, to achieve a global improvement in personal well-being, not only drugs, but also complementary therapies, such as physical exercise, occupational therapy, speech therapy, and active music therapy, have been used. **(**Pacchetti et al., 2000).

Experimental

Used materials

We analyze 40 patients with PD. From them, 20 received only medication and for 20 of them we initiate music and exercise. We used a questionnaire who include age, sex, age at disease onset, disease duration, symptoms, activities of daily living, gait disturbance, history of falls, etc. The rehabilitation program includes twenty minute of exercise three times a week. We performed Beck depression scale, UPDRS scale.

Work methodology

We investigated changes in non-motor symptoms (anxiety, depression etc) function in relation to repetitive voluntary thumb movement in patients with PD. We observed that they respond well to instrumental hymns and spirituals. Music therapy has proven to be particularly effective in decreased of anxiety, depression.

We studied the short – term effects of axial rotation exercises. We measured thoracolumbar range of motion, supine to stand before and after individual instruction once a week for 4 weeks.

Next, we studied the effect of training for inpatients with disuse muscle weakness.

Our recovery objective was to:

- educate the patient for a good life
- to optimize his postural stability
- to optimize his respiratory capacity
- to optimize his functional capacity;

Characterizations

Instruction in appropriate exercises might prevent disuse weakness and cardiopulmonary insufficiency and help maintain ADL and QOL in patients with PD.

Results and discussions

We initiated a questionnaire survey of patients with Parkinson disease because patients with PD falls represent one of the risk factors for disability in ADL.

Researchers reported that falls occurred in 68.3% of patients with PD, and falls were significantly associated with disease severity, balance impairment and depression They stressed the need for interventions to prevent falls in patients with PD. (Wood et al.2005)

The idea of PD as a pure motor disturbance must be reconsidered. Phenomena like kinesia paradoxica, i.e., the sudden mobility and agility of otherwise akinetic PD patients in situations of great emergency, suggest that the nature of this pathology cannot be motor in a strict sense. In line with this hypothesis, (Mazzoni et 2007al) showed that patients can exhibit "normal" motor behavior even in simple arm-reaching movements, not just in extreme cases.

Some of them reported that fractures due to falls were significantly more common in a PD group (15%) than the corresponding control group (7.5%), and the commonest site of fractures in the PD group was the femur, wile it was the forearm in the control group .The risk of fracture was significantly increased in PD relative to the control group, and hip fractures can cause disuse syndrome, impairment of ADL and poor quality of life (QOL). (Genever et. Al, 2005)

Same clinicians reported that fear of falling was significantly associated with a qualitative estimate of postural control in patients with PD. (Adkin et al. 2003)

In Constanta Ambulatory Unit we used a questionnaire to survey 40 patients with PD. Study sample included 25 men and 15 women, with an average of 68.3 ± 8.5 years.

The items included on the questionnaire covered age, sex, age at disease onset, disease duration, symptoms, activity of daily living (ADL), medication, gait disturbance, history of falls, fracture due to falls, etc.

Our results showed that the risk of falls increased with worsening Hoehn and Yahr (H-Y) disease, and patients of H-Y stages 3-4 were likely to fall when starting to walk, and at the end of walking period and when adjusting their posture. About 30% of patients with H-Y stage 3-4 PD experienced fractures of limbs and trunk due to falls.

PD patients were most likely to fall over between 10:00- 12:00 am, and between 02:00- 04:00 pm. The result reflects the effects of gradually decreasing PD medication levels, between 10:00-12:00 am, when patients are working actively, being involved in house working during both periods.

Patients with PD are likely to lose confidence in gait control after experiencing a fall, and then may not want to walk unaided. Fig. 4 shows where the patients experienced falls indoors. Patients with PD were most likely to fall in a living room and this reflected that they spent most of their time in a living room during daytime. The other common places for falls included bedroom, corridor, kitchen, bathroom, and entrance.

Exercise and education

Exercise is an important non-pharmacologic therapy, which can be beneficial for patients at all stages of PD. The aims of exercise are 1) training for primary symptoms such as rigidity, bradykinesia, balance impairment and gait disturbance; and 2) training for secondary disuse syndrome, such as muscle weakness, range of motion restriction, low strength, and cardiopulmonary insufficiency, due to inactivity caused by primary symptoms.

Schenkman reported that exercise (three times per week for 10 weeks) significantly improved functional axial rotation and functional reach in patients with the early and mid stages of PD. (Schenkman et al.,1998) Appropriate exercise is effective in improving ability of functional movements.

Pacchetti et al. studied the effect of active music therapy and physical therapy, and reported that active music therapy had a significant effect on bradykinesia, Happiness measure and QOL. Music therapy is effective for both motor and emotional function.(Pacchetti et al.,2000).

Thaut et al. studied the effect of gait training with rhythmic auditory stimulation and self-paced training. They reported that patients with PD who trained with accompanying rhythmic auditory stimulation significantly improved gait velocity, stride length, step cadence and timing of EMG pattern. In addition, Frenkel-Toledo et al. reported that treadmill walking reduced stride time variability and swing variability in patients with PD. Music therapy, rhythmic auditory stimulation and treadmills play the role of an external pacemaker when influencing movement and gait control in patients with PD. Training with an external pacemaker is often useful during training in PD of all stages.

Exercise and music for patients with PD can improve motor and nonmotor symptoms and can be beneficial for patient with PD. Our study wants to identify the possibility of exercises program associated with music to improve the quality of life for these patients. The PD available therapy includes pharmacologic management, deep brain stimulation of the thalamus and subthalamic nucleus, rehabilitation and education. Here, I would like to explain a method of rehabilitation for our patients with PD.

We analyze 40 patients with PD. From them, 20 received only medication and for 20 of them we initiate music and exercise. We used a questionnaire which includes age, sex, age at disease onset, disease duration, symptoms, activities of daily living, gait disturbance, history of falls, etc. The rehabilitation program include twenty minute of exercise three times a week. We performed Beck depression scale, UPDRS scale.

Two routes for voluntary movement are available in the nervous system. The decreased function of basal ganglia due to PD impaired the route

from the basal ganglia to the supplementary motor cortex. These data suggest that the route from sensory input to cerebellum to premotor cortex could compensate for the decreased function of the route via the basal ganglion to the premotor cortex. Once change occurred in the motor cortex, the change persisted even after interruption of the training. These phenomena suggest that motor memory can be stored in the motor cortex. In addition, rhythmic sounds may be an effective rehabilitation tool for improving gait disorder and motor performance in PD patience who experience the freezing phenomenon.

Montgomery et al. assessed the effect of an education program for PD. (Montgomery et al.,2000) The health promotion program (PRORATH) was designed to improve health confidence, provide information and support, improve physical function through exercise, and promote cooperation with the physician to optimize medical treatment and compliance. A total of 140 patients in the intervention of PRORATH group and 150 patients in a control group questionnaires by mail at 0, 2, 4 and 6 months. The intervention group had significantly increased exercise, decreased „time off'' and percentage of time off, fewer side effects, and decreased summary Parkinson scores. During the study period, levodopa dose rose for controls and the intervention group, although only slightly in the latter group. The authors concluded that the patient education program provided a useful adjunct to medical therapy of PD. Education programs for patients with PD are one of the important therapy modalities needed for early and mild stages of PD.

We studied the short – term effects of axial rotation exercises. We measured thoracolumbar range of motion, supine to stand before and after individual instruction once a week for 4 weeks. The patient` s active thoracolumbar range of motion significantly increase after axial rotation exercises over 4 week.

Next, we studied the effect of training for inpatients with disuse muscle weakness. The subjects were 15 inpatients with muscle weakness of lower limbs and 11 inpatients without muscle weakness. The average age was 71.8 ± 6.4 years in the muscle weakness group and 63.6 ± 10.7 years in the normal muscle group. There was a significant difference between the average age in two groups. In the muscle weakness group, 5 patients had iliopsoas muscle weakness, 2 patients had gluteus medius muscle weakness and 8 patients had iliopsoas muscle and other muscle weakness. The patients received 4 weeks of music therapy. The patients in the muscle weakness group improved the weakness of their lower limbs, decreased the average 10-metre gait time from 13.1 seconds to 10.5 seconds, and decreased step number for 10-metre gait from 23.8 steps to 19.4 steps. Thus, increased muscle strength in the lower limbs resulted in improvement in gait velocity and brachybasia.

Conclusions

Proving beneficially, a set of exercises can improve motor and non-motor symptoms of the patients with PD, but does not apply in advances case. The best option would be a controlled exercise program of 20 minutes, with various exercises picked form aerobic, stretching and strengthening disciplines, repeated three times a week. In addition, music therapy might be effective, improving gait disorder and motor performance in patient with PD in all stages. It is important to perform a recovery training knowing very well the stage of the disease and the balance sheet of the principal complication of the disease.

We hypothesized that active theater, which shares some features with active music therapy, might have a stronger effect than music because of the special features required by this discipline. In order to be able to impersonate a character, patients need to control their bodies and minds carefully so patients have to be aware of and control each movement they produce and, at the same time, they also have to represent their character‟s emotions, i.e., they need to be able to feel and reproduce his/her feelings. In addition, both during the performance and off the set, patients have to interact continuously, so they are forced to socialize.

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COMPARING TWO MODES OF EXERCISE TRAINING WITH DIFFERENT INTENSITY ON BODY COMPOSITION IN OBESE YOUNG GIRLS

RAMIN EIMARIESKANDARI[1], SHIRIN ZILAEIBOURI[2], MARYAM ZILAEIBOURI[3], AKRAME AHANGARPOUR[4]

Abstract

Purpose. Obesity is currently a serious, worldwide public health problem and a lifelong disease requiring early intervention before adulthood .This study compares the effects of high intensity aerobic training (HIAT) and Moderate intensity aerobic training (MIAT) after four and eight weeks on body composition in girls' obese students.

Methods. The present study includes 21 obese female students (fat percent 36% and BMI: 29.6%) randomly placed in three same groups, HIAT (n =7), MIAT (n =7) and control (n =6). Body composition (weight, body mass index, fat percentage, body fat mass, lean body mass and waist to hip ratio) in the students was measured using Bio-impedance before, in the middle and after 8 weeks of exercise. The exercises were done three days a week with interval high intensity (85-95% HR peak) and continuous moderate intensity (50 -70 % HR peak) respectively for 33 and 41 minutes with the same energy expenditure on the treadmill. To data analysis, parametric methods were used *(t* - paired and ANOVA) at significance level of α=0.05.

Results. Results showed that although HIAT reduced the mentioned items in body composition in each of the testing processes, but this reduction was not significant, while the MIAT significantly decreased fat percentage, fat mass and WHR after 8 weeks. It also reduced other items except body lean mass but, they were non-significant. The significant difference was observed in body fat mass and fat percentage after 8 weeks between MIAT and HIAT. Comparing MIAT and control groups showed that significant difference in fat mass after 4 and 8 weeks and in fat percentage after 8 weeks.

Conclusions. Research results indicates that the MIAT causes further changes in body composition compared to the HIAT, although, during activity, HIAT fat oxidation rate was significantly improved after 8 weeks.

Key words. Aerobic training, Body composition, Intensity, Obesity

Introduction

Today, obesity and overweight have drawn world research's' attentions as a problem. As it has been cleared, sedentary and obesity are risk factors for many common diseases of the world including diabetes type 2, cardiovascular diseases, blood pressure, high blood lipid, arthritis, asthma, and recently cancer.

On the other hand, body activities especially along with diets have been considered as a strategy for weight loss. Regular activities are followed by metabolic changes in muscles and adipose tissues; therefore they increase using of fats as energy instead of storing them. Some research also mentioned that exercises can improve appetite (Bilski et al, 2009; Bay et al, 2009). However weight loss is not the only benefit of exercise and some other desired effects such as improving cardiovascular risk factors, decreasing harmful blood lipid, decreasing blood pressure, decreasing glucose level in blood, decreasing depression, improving muscle strength and preventing osteoporosis are attributed to exercise.

Researchers conducted extensive researches on the best method of exercise which help with body weight management. Endurance exercises with low to moderate intensity have been usually considered as a desired method for fat and weight loss from so long.

Due to time shortage in modern human life and as these kinds of exercises take lots of time; scholars have dealt with more modern methods of weight loss. They have newly shown that higher intensity exercises lead to weight loss and fat-flush increase. Some studies have shown that high intensity exercises by healthy people, obese women before menopause, overweight

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Received 21.03.2012 / Accepted 10.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

male soldiers and cardiac patients improve blood lipid profile, body composition, fat oxidation, weight loss and maximum oxygen consumption. Burgomaster et al (2005) and Talanian et al. (2006) showed that short time exercises, i.e. 6 sessions, with high intensity increase fat oxidation in healthy active or sedentary people. Mara et al. (2007) also showed that exercises with high intensity decrease higher percentage of fat among overweight male soldiers. However, Van Ajel Ligsen et al., (2002), did not find any differences between fat percentages during two exercises of high and low intensity. Therefore, we do not yet know what exercise intensity and how long exercising has the most influence on body composition. In this case, this research was conducted aiming to study the influence of exercise intensity during a 4-week and 8-week exercise on body composition of young obese girls. High intensity exercises were done constantly so that obese girls obtain the ability to do them. Exercises with

Method

After primitive screening, 21 volunteer obese young girls (age 22.1 ± 0.49 years, weight 77 ± 2.40 kg, height 161.5 ± 1.43 cm, fat 36.1 ± 0.57%, BMI 29.6±0.93 kg/m^{-2}) exercised with treadmill 3 days a week for 8 weeks. The limitations of the research were non-participation in any kinds of physical activity at least for 6 months, not catching any diseases and having at least 35% fat. Consent form was completed by all samples. All

samples cooperated eagerly up to the end of research. Samples were randomly divided into 3 groups with high exercise intensity (VO_{2peak} 80-90%), moderate exercise intensity (VO_{2peak} 50-60%) and control group. There were not any significant differences among the three groups before conducting the research (Table 1). Samples were asked to keep their diet constantly during the whole study. For this purpose, 7-day diet reminding questionnaire was used. Research protocol was surveyed by Ethics Committee of Islamic Azad University.

Physiological assessments

Height of the samples was measured by digital height gauge (Satrap, Iran); weight, fat percentage, fat mass and lean body mass also measured by bio-impedance (Olympia, Korea).

Maximum oxygen consumption was measured by modified Bruce treadmill test (hp-cosmus,Germany) and through collecting respiratory gases (Ganshorn,Germany) using direct calorimetric method. Heart beat was measured constantly through Polar heart rate monitor.

The Exercise program

Having assessed body compositions, VO_{2peak}, and diving patients into two groups of high intensity interval training (HIIT) and moderate intensity continual training (MICT), all of patients participated in an exercise program of three times per week in an 8-week duration. The HIIT group was walking on the treadmill to warm up for 5 minutes specified by 50–60% of VO_{2peak} (50–70% of HR_{peak}), then they were exercising for four intervals of 4- min at 80–90% of VO_{2peak} (85–95% of HR_{peak}), and three intervals of 3-min at 50–60% of VO_{2peak} (50–70% of HR_{peak}). Each training session terminated by a 3-min cooling down period at 50–70% of VO_{2peak}. Therefore total exercise time in each session was 33 minutes. The subjects of continual training group were walking on the treadmill for 41 minutes with 50-70% of HR_{peak} .The first and the last 3-5 minutes of each session was dedicated to warm-up and cool-down and its intensity was less than the one in the main program. To equate the total work performed by the two groups in each session, the following formula was used (3-5):

$$\text{Time spent in MCIT} = \frac{(60\% \text{ of mean } vo_{2peak} \text{ of all subjects}) \times 3\times3 + (90\% \text{ of mean } vop_{2eak} \text{ of all subjects}) \times 4\times4}{\text{Intensity of MCIT (60\% of mean } vo_{2peak})}$$

Table 1. Physical characteristics of subjects in each group

Parameter	HIAT	MIAT	Control	*p*
Number	7	7	6	NS
Age(years)	22.29±0.89	21.37±0.5	23±1.15	0.35
Height(Cm)	162.4±1.4	160±0.03	162±0.03	0.84
Weight(Kg)	77.13±2.7	78.68±5.9	74.63±1.72	0.81
Waist to hip ratio	0.89±0.01	0.89±0.02	0.87±0.013	0.66
Fat Percent (%)	35.96±0.56	36.90±1.23	35.47±1.01	0.60
BMI(kg/m^2)	29.2±0.8	30.65±2.25	28.6±1.16	0.67
VO_{2peak}(ml/kg^{-1}.min^{-1})	20.40±1.6	19.65±2.51	19.35±2.67	0.23

***P* value less than 0.05**

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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Statistical analysis

After determining normality of the data through Kolmogorov-Smirnov test, parametric one-way analysis of variance (ANOVA) was used through post hoc test LSD and Paired T test along with Bonferroni correction to survey research hypothesis at the meaningful level of ($05/0 \geq \alpha$). Data were analyzed through computer software spss version 17.

Result

Results showed that fat percentage (P=0.014), fat mass (P=0.015) and waist-hip ratio (P=0.007) had significant decrease only in the group with moderate exercise intensity before and after 8 weeks exercise.

Also fat mass was significant in the group with moderate exercise intensity in compare with control group (P=0.029) after 4 weeks and with the group by high exercise intensity (P=0.027) and control group (P=0.011) after 8 weeks. Percentage of fat was significant only after 8 weeks in the group with moderate exercise intensity in compare with the group by high exercise intensity (P=0.02) and control group (P=0.03). (Table 2).

Table 2. Metabolic data of two groups before and after training

Parameter	HIAT		MIAT		Control	
	After 4 week	After 8 week	After 4 week	After 8 week	After 4 week	After 8 week
Weight(Kg)	76.87±2.88	76.64±2.84	77.66±5.87	77.59±6.18	75.63±2.47	75.67±2.76
FP (%)	35.61±0.81	35.81±0.73	35.12±1.35	35.17±1.34δ§*	34.98±1.17	35.23±0.92
BFM (Kg)	27.50±1.58	27.57±1.51	27.45±2.61§	27.11±2.58§δ*	26.62±1.35	26.75±1.54
BMI(kg/m^2)	29.09±0.81	29.01±0.84	30.24±2.22	30.19±2.32§	28.98±1.32	29±1.32
LBM (Kg)	49.37±1.36	49.07±1.38	50.21±3.6	50.42±3.93	49.25±1.75	48.92±1.36
WHR	0.88±0.007	0.88±0.009	0.87±0.02	0.87±0.02*	0.87±0.009	0.87±0.009

FP: Fat Percent; BFM: Body Fat Mass; BMI: Body Mass Index; LBM: Lean Body Mass; WHR: Waist to hip ratio

*Different from baseline, P<0.05; δDifferent from HIAT, P<0.05; §Different from Control, P<0.05

Discussion and conclusion

Results showed that fat percentage, fat mass and waist-hip ratio had significant decrease in the group with alternative moderate exercise intensity before and after 8 weeks. Also fat mass was significant in the group with moderate exercise intensity in compare with control group after 4 weeks and with the group by high exercise intensity and control group after 8 weeks. Percentage of fat was significant only after 8 weeks in the group with moderate exercise intensity in compare with the group by high exercise intensity and control group.

Duration of the exercises was considered 8 weeks in the present research. Exercises with high intensity (HR_{peak}85-95%) were done alternatively with decreasing the intensity in some period so that sample being able to exercise for 31 minutes as some researchers have recently shown that exercises with high intensity can decrease weight and fat percentage or increase fat oxidation (Trojan et al, 2009; Davidz et al., 2008; Adel et

al., 2010; Pari et al., 2008). As exercise with moderate intensity (HR_{peak}65-75%) is the common exercise in researches about weight loss and as it is a suitable exercise for health, it was selected for comparison. Exercises with high intensity were previously studied among diabetics, cardiac patients, patients with metabolic syndrome and even healthy active people and military men. Results showed that exercise with high intensity can improve factors such as weight loss, fat percentage and increase capacity of fat oxidation (Mara et al., 2007; Zilaei et al, 2012; Burgomaster et al, 2005).

Talanian et al, showed that alternative short time exercises, i.e. 6 sessions, with high intensity will increase fat oxidation. In the present research, 2 exercise programs were isocaloric so that exercise intensity being as an effective factor on body composition. Exercises with moderate intensity for 41 minutes had more effect on fat lose. It also decreased fat mass and percentage significantly in 4th and 8th weeks while exercises with high intensity could not significantly effect on any body composition factors.

At the beginning of the research, in addition of group integrating with regard to physiologic characters, all samples were asked to keep their received calories fixed through recording their food consumption using 7-day diet reminding questionnaire before of the research, among the weeks of exercises and at the final week of exercises. Although there was no significant difference in received calorie from before to after the research, but in the group with high exercise intensity, received calorie showed more increase in compare with the group by moderate exercise intensity. Also in the

group with high exercise intensity fat free mass increased a little which was not significant. This is while there was not significant decrease in weight in both groups. The study by Mara et al. (2007) conducted in the same intensity rate with the present research, showed significant decrease in fat percentage in the group by high exercise intensity. This is while that in the present research, male soldiers was overweight who exercised for 14 weeks. In this research, samples run or walked fast 30 km for the first 5 weeks and 4 km for the remained 9 weeks with intensity HR_{max} 60-70% in group with moderate exercise intensity and HR_{max} 75-90% in group with high exercise intensity. In the present research, only changes of fat percentage were surveyed in advance and after exercise. Irving et al. (2008) also surveyed the effect of 16 weeks exercise on 27 obese women suffering from metabolic syndrome in three groups, i.e. control, exercise with high intensity (higher than lactate threshold for 3 days and less than lactate threshold for 2 days a week) and exercise with moderate intensity (less than lactate threshold for 5 days a week). The results mentioned that exercise with high intensity decrease abdominal fat, abdominal subcutaneous fat, total percent of body fat, body weight and BMI significantly while there was not any significant changes in any factors in group with moderate exercise intensity and in control group. Exercises were coordinated based on consuming calories and the group by high exercise intensity showed significant decrease in abdominal fat and abdominal subcutaneous fat in compare with the group by moderate exercise intensity. Scholars reported factors which stimulate effect of exercises with high intensity on body fat decrease including more lipolitic hormone secretion (growth hormone and epinephrine) in exercises with high intensity which facilitate more fat oxidation. The other factor is that under isocaloric condition, exercises with high intensity cause more balance in negative energy in compare with exercises with low intensity. Researchers of this study did not mentioned that why exercise with moderate intensity for 5 days a week which burned 350 to 400 calories could not change amounts of body compositions. In another research by Santez et al. (2004), different amount of exercises on body composition and weight of overweight sedentary and women were compared. Results showed that all exercises with low volume/moderate intensity (19.2 km with VO_{2peak} 40-55%), low volume/high intensity (19.2 km with VO_{2peak} 65-80%) and high volume/high intensity (32 km with VO_{2peak} 65-80%) for about 3-4 days a week during 5 to 8 months significantly decrease weight, fat mass and body fat percentage. Of course amount of decrease was more in group with high volume/high intensity. Therefore scholars suggested that when there is lack of change in diet, more activity is required to keep weight. Also observed positive balance of energy is little in overweight people which could be inversed through moderate volume of exercise (30 minutes for all days of a week). In compare with the mentioned researches, Gootin et al. (2002) surveyed effects of exercise intensity on body composition and abdominal obesity in obese adults. They found that although exercises with high intensity improve cardiovascular preparedness but they are not superior to exercises with less intensity to decrease body fat percentage. In this research eighty 13-16 years old adults exercised for 8 months and had the same consuming calories in two groups with high exercise intensity and moderate exercise intensity. In a research by Geradgin et al. (1995), 12 unexercised women with extra fat mass were divided into two groups of high exercise intensity (VO_{2max}80 %) and low exercise intensity (VO_{2max} 50%). After 12 weeks exercise (4 days a week) body composition did not show any significant difference in both groups, although fat-free mass increased in the group with high exercise intensity and fat mass decreased in both groups. Researchers suggested that it is also the reason of absolute decrease of weight in the group with low exercise intensity. They also suggested that if fat decrease is the goal and if there is not enough time, then exercises with high intensity could be more effective. In another research by Domortyer et al. (2002), it was showed that 2 month exercise with low intensity (in a level with maximum fat oxidation) decreased body fat percentage, body weight, circumference of the waist and the hips and improved fat oxidation normally in 17 patients suffering from metabolic syndrome. Researchers mentioned that this level of exercises is more delight for sedentary people so that it cause more fat-flush. In addition strength against insulin was decreased in these people. Extensiveness and variety of applied intensities in different researches lead to different results. It is believed that what is happened after the duration of exercise (recovery) is more important than the time of exercise for fat decrease. These beliefs in researches show that if two methods of exercise are coordinated regarding consuming calories, usually exercises with high intensity, low intensity, below the maximum and alternative exercises do not show significant differences regarding fat decrease. In fact, during more studies which amount of burning calories measured after exercises, it was cleared that exercises with high intensity much more increase burning calories (Trembly et al., 1994). In fact in exercises with high intensity, consuming calories after exercise applied more fat in compare with exercises with low and moderate intensity due to increase in extra consuming oxygen (Seldak et al. 1989; Mac Ardel, 1996). More studies have dealt with comparing exercises of low and high intensity due to effect of exercises with low intensity on more fat oxidation and a few studies have dealt with comparing exercises with moderate and low intensity; however they mentioned inconsistent results which are due to difference in selecting samples and their particulars, time of exercise or kind of diet control.

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

CEREBRAL CORTEX, SENSATIONS AND MOVEMENTS

STRATON ALEXANDRU[1], GIDU DIANA[1], ENE VOICULESCU CARMEN[1], STRATON CORINA[2]

Abstract

The links of cerebral cortex areas still presents many unknowns regarding interpretation of sensations and generation of movement. The role of motor cortex in learning and execution of movements is well known, but there is a deep understanding of motor cortex function which still eludes us. In the literature, there is still a controversy regarding what the motor cortex codes: the spatial aspects (kinematics) of motor output (direction, velocity and position) or the muscle control and forces (kinetics). Therefore, this study is mainly focused on the understanding of how the movement is generated by the functional association (or inter-relations) of cerebral cortex areas.

Key words: cerebral cortex, Brodmann areas, sensations, movements.

Introduction

The brain is a part of the CNS (Central Nervous System) and is divided into four parties, namely: large brain (cerebrum), diencephalon, cerebellum and brainstem (G. Davies, 1998) (fig. 1.).

The brain controls voluntary movement through its intrinsec and extrinsec nervous connections. One of the most important part of the brain which controls movement is cerebral cortex. It is well known that the connections of cerebral cortex areas produce movement, but how the involvement of nervous circuitry of these areas produce movement its not well understood. Therefore, a better understanding of cerebral cortex functions related to sensations and movements may lead to an explanation of how the movement is generated by cerebral cortex areas and how these areas are connected (colaborate) to produce movement.

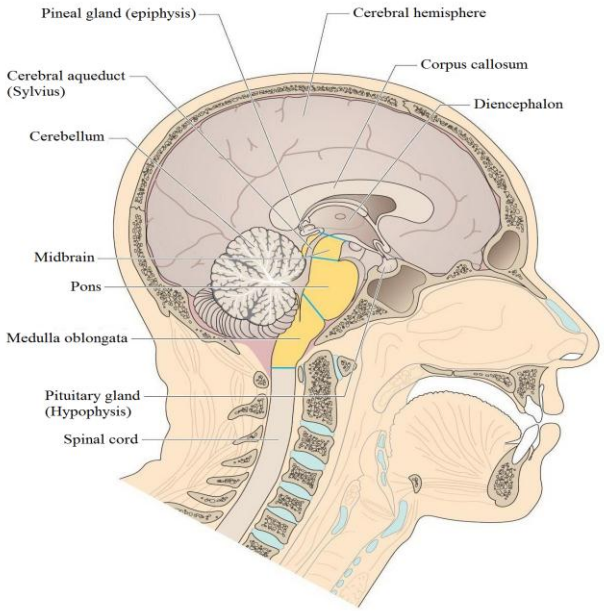

Fig. 1. Nervous structures components topography of the central nervous system. (adapted with permission from A. Faller et al., 2004)

Anatomical view of cerebrum

Cerebrum (which comprise about 80% of the brain) is consisted of right hemisphere and left hemisphere, which are divided by the longitudinal cerebral fissure and functionally linked together by a large tract of nerve fibers (axons) (about 200 million), which form corpus callosum. Cerebrum includes in its composition, the cerebral cortex (with a thickness between 2mm and 4mm), which is composed of gray matter (composed of local networks of neurons with dendrites and short unmyelinated axons), being located

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Email: axelcorro@yahoo.com
Received 11.05.2012 / Accepted 02.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

on the surface and covering the white matter (composed of very long myelinated axons which realize global and rapid nervous communication; it contains association fibers, which conduct nerve impulses between neurons corresponding to the same cerebral hemispheres - commissural fibers that connect neurons and gyri, between hemispheres and - projection fibers which forms ascending and descending tracts necessary for the transmission of nerve impulses from the cerebrum into the other parts of the brain and/or spinal cord and vice versa). The cerebral cortex is characterized by numerous creases (including gyri (bumps) and sulci (sulcus sg.) (ditches)) which are called circumvolutions. Each cerebral hemisphere is divided by deeper sulci (grooves) called fissures into five lobes, four located on the surface - frontal lobe (the faces of the hemispheres), parietal lobe (central parts of the cerebral hemispheres), temporal lobe (external and lateral parts of the cerebral hemispheres) and occipital lobe (posterior parts of the cerebral hemispheres) - and one located centrally - the island (fig. 2.).

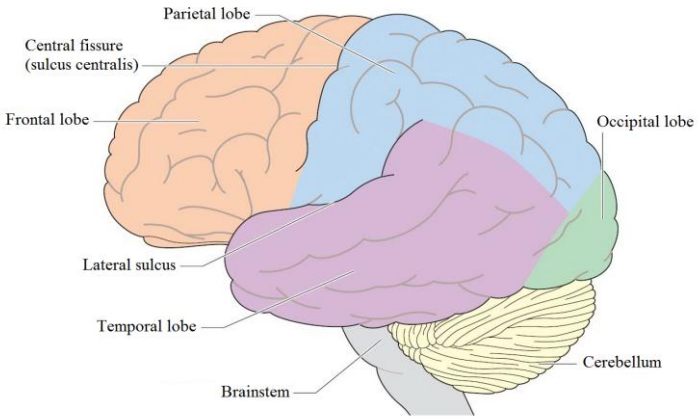

Fig. 2. Topography of the four lobes and two sulci (deeper fissures) of the brain; are represented, also, the position of cerebellum and brain stem; left lateral view. (adapted with permission from A. Faller et al., 2004)

Functional aspects of cerebral cortex lobes and areas

The frontal lobe contains the primary somatomotor cortex (primary motor cortex area) (Brodmann area 4) (fig. 3. and fig. 4), located in the precentral gyrus and anterior paracentral gyrus. Precentral gyrus (located immediately to the central sulcus), covers much of the primary somatomotor cortex and anterior paracentral gyrus covers the medial continuity of primary somatomotor cortex, both being involved in motor control, because they contain neurons (giant pyramidal neurons – of Betz's - belonging to layer V) involved in muscle control. Primary motor cortex area of one of the cerebral hemispheres includes cortical nerve centers which controls all muscles or muscle groups belonging to contralateral side of the body.

The face is represented in the first one third of the lateral precentral gyrus, the upper extremity (arm, forearm and hand especially), is represented in the second third of the lateral precentral gyrus, and the trunk is represented in the third third (medial) of the precentral gyrus; the hip is represented in the place where precentral gyrus is continuing with paracentral gyrus and the lower limb (thigh, leg and foot), is represented in anterior paracentral gyrus (fig. 5. and fig. 6.). Damage to the primary motor cortex area of one of the cerebral hemisphere, is leading to muscle weakness or paralysis of contralateral body parts (D. E. Haines, 2006; I. Petroveanu and N. Cozma, 1989).

It seems that the activity of corticospinal neurons corresponding to primary somatomotor cortex may change during the execution of a movement. Under certain conditions the corticospinal neurons corresponding to primary somatomotor cortex are activated slightly before performing a movement, showing no function for the coding of movement, but rather presenting function in the assessment of force necessary to perform a movement. Other populations of neurons corresponding to primary somatomotor cortex may encode the direction of movement (J. P. Donoghue and J. N. Sanes, 1994). P. D. Chaney (1985), showed that the execution of a movement is the main function of the primary motor cortex, which translates programmed instructions of movement to other parts of the brain in nerve signals which, in turn, encode movement variables such as force, contraction time and muscle to be contracted.

Also, on the surface of the frontal lobe there are Brodmann areas 6 and 8 [1] with major motor functions (Brodmann area 8 shows only motor function), produced by nerve connections with the striatum and

[1] Brodmann area 6 can be decomposed into Brodmann areas 6α and 6β and Brodmann area 8 can be decomposed into Brodmann areas 8α, 8β, 8γ and 8δ.

other nuclei of the extra-pyramidal system (red nucleus, substantia nigra, etc.). In Brodmann area 8 there are nerve centers (part of the oculocephalogyric area) that control combined eye and head movements; so, the nerve center of the right hemisphere produce simultaneous head and eyes left turns and vice versa.

Premotor area is located above Brodmann area 4 (at the base of precentral gyrus), which presents role in the preparation (arbitrary coupling of cues in motor acts) (J. P. Donoghue and J. N. Sanes, 1994) and initiation of motor response made by Brodmann area 4. It seems that the corresponding neurons of premotor area are active during the interval between movement presentation and start signal of movement beginning. In other words, premotor cortex is activated for body (or body segments) orientation (position) in space to achieve a movement. P. D. Chaney (1985), concluded that premotor area participate in the assembly of new motor programs.

Supplementary motor area is located on the internal face of cerebral hemisphere between Brodmann areas 4 and 6α, having a role in controlling basic (elementary) movements ordered by Brodmann area 4, in controlling of automatic movements associated with speech and in controlling postural complex movements. J. M. Orgongozo and B. Larsen, (1979), concluded that the supplementary motor area presents a major role in initiating and controlling, at least, of certain voluntary movements. The basic function of supplementary motor cortex is for organizing and planning the muscle activation sequences necessary in the execution of movements (J. P. Donoghue and J. N. Sanes, 1994), reported to primary motor cortex which presents mainly function in the execution of movement. Some authors suggest that supplementary motor area is a specialized zone in programming motor subroutines and in this area are temporally ordered motor commands before motor actions will be executed by the primary motor cortex (P. E. Roland et al., 1980). Also, supplementary motor area is involved in planning complex sequences of discrete movements performed rapidly (ex. finger movements while playing the piano) (P. D. Chaney, 1985).

All these issues involving the motor cortex suggest that, it has a role in learning and execution of muscles voluntary actions.

There are an extensive number of studies which states that cells which correspond to the motor cortex are strongly correlated with upper limb movement direction in space. Even if the motor cortex may encode static kinematic [2] relative parameters as movement direction, it seems that also may reflect (but with a weaker influence) kinematic parameters that change continuously during dynamic movements performed in a straight line (in the same plane or 2D) as position, velocity and acceleration (J. Ashe and A.P. Georgopoulus, 1994). Thus, direction and speed of movement, which can vary continuously, is strongly reflected in the motor cortex. Also, a large number of studies have shown relationships between motor cortex and the magnitude, direction and rate of force changes (kinetics [3]). Thus, there is clear evidence that, movement is primarily represented in kinematic form and the beginning of the actual movement is produced by activating the appropriate muscle groups (kinetics). Assumptions underlying these successive coordinate transformations are that, the different motor areas (including some areas of the parietal cortex) are involved in various stages of this transformation from kinematics to kinetics. However, closer to the truth, the motor cortex, may be involved in the final stage of transformation from kinematics to kinetics or may implement kinetics based on instructions offered by lateral premotor cortex or supplementary motor area. However, motor cortex involvement in the transformation from kinematics to kinetics is not yet clear. The conclusion proposed by A. Riehle and E. Vaadia, (2005), shows that, even if the motor cortex controls muscles and movement, it seems that it is focused mainly on spatial aspects. In other words, the primary motor cortex encodes most relevant aspects of spatial motor response, both in dynamic motion and in purely isometric behavior.

[2] study of body movement (characteristics of motion), independent of their masses and the causes that produce movement (forces).

[3] relationship between the motion of bodies and causes of these movements (forces).

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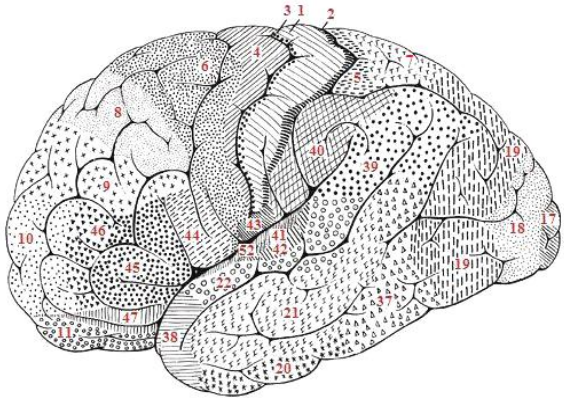

Fig. 3. Brodmann areas topography (seen from the side of the left hemisphere) (adapted with permission from P. W. Brazis et al., 2007).

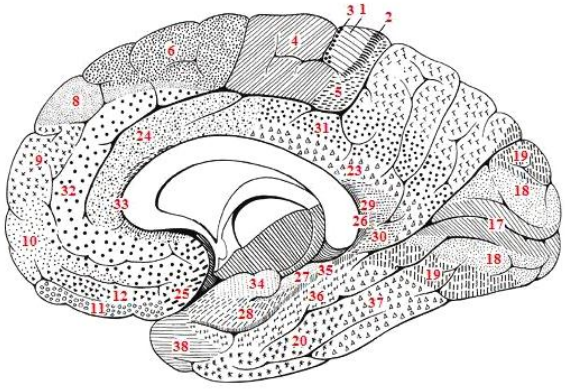

Fig. 4. Brodmann areas topography (medial section view of the left side of the left hemisphere) (adapted with permission from P. W. Brazis et al., 2007).

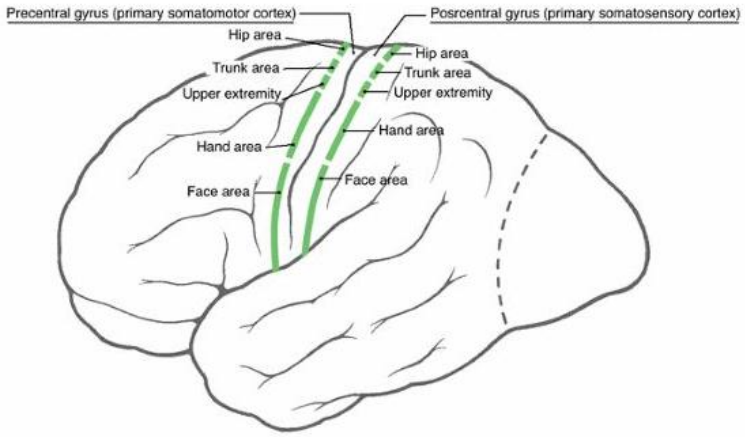

Fig. 5. Topography of motor and sensory areas located in precentral, respectively, postcentral gyri (side view of the left hemisphere).

Precentral gyrus (primary somatomotor cortex) - hip area includes the area of hip-femoral joint; upper extremity area consists of the forearm and arm areas (including areas of shoulder, elbow and hand joints); hand area consists of palm, thumb, index, middle finger, ring finger and little finger areas; face area consists of neck, brow, eyelid, eye, facial expression, mouth, chin, tongue, swallowing, saliva secretion, mastication and phonation areas.

Postcentral gyrus (primary somatosensory cortex) - hip area of the postcentral gyrus is formed by hip (including hip-femoral joint area) and leg areas (including knee joint area); trunk area includes areas of the head and neck; upper extremity area consists of the forearm and arm areas (including areas of joint shoulder, elbow and hand); hand area consists of palm, thumb, index, middle finger, ring finger and little finger areas; face area consists of eye, nose, face, lip, lip, lower lip, teeth, gums, jaw, tongue, pharynx and intra-abdominal areas. (adapted with permission from D. E. Haines, 2008).

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
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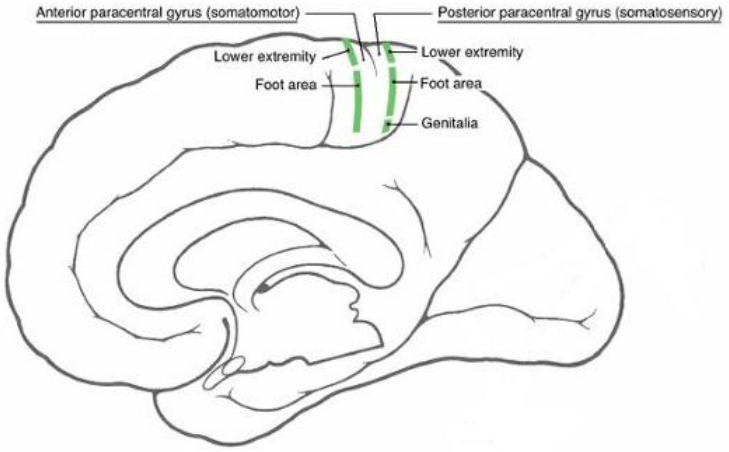

Fig. 6. Topography of motor and sensory areas located in anterior paracentral and, respectively, posterior paracentral gyri (medial section view of the left side of the left hemisphere).
Anterior paracentral gyrus (primary somatomotor cortex) - lower extremity area consists of thigh and calf areas (including the area of the knee joint); foot area includes the area of the ankle joint.
Posterior paracentral gyrus (primary somatosensory cortex) - lower extremity area consists only of the calf area; the leg area includes ankle joint area. (adapted with permission from D. E. Haines, 2008).

Specific maps of these areas involve higher regions of the cortex devoted to the lower parts of the body (ex. toes) and lower regions of the cortex devoted to the upper body (ex. the head). Therefore, the arrangement of cortical nervous centers is disposed as a motor or sensory homunculus upside down. An interesting aspect of these maps is that the size of cortical areas responsible for different parts of the body isn't directly proportional to the size of the body part being monitored. Thus, body parts with high density of receptors is controlled by the largest area of primary sensory cortex and body parts with the highest number of motor innervations is controlled by the largest area of primary motor cortex. Therefore, hands and face (which has the highest density of sensory receptors, respectively, motor innervations) are controlled by the largest area of precentral gyrus (motor) and postcentral gyrus (sensory). Large territory of the motor area that controls hand movement is due to precise, fine, and diversity of movements which it executes.

The temporal lobe contains the auditory centers (primary auditory cortex (Brodmann area 41) belonging to transverse temporal gyrus (of Heschl's), the psycho-auditive area (Brodmann area 42) and the auditory gnosis area (Brodmann area 22) which are involved in memorizing (storing) visual and auditory experiences, in interpretation and combination of visual and auditory information. Primary auditory cortex damage produces difficulties in interpreting sound or location of sound in space. Also, it seems that vestibular sensitivity areas are in the vicinity of auditory centers.

Occipital lobe is the primary area responsible for coordination of eye movements; also, is involved in linking visual images with previous visual experience and other sensory stimuli. Primary visual cortex (Brodmann area 17) is located in cuneus and lingual gyri which is directly adjacent to the calcarin sulcus. Damage to primary visual cortex of one occipital lobe causes the loss of visual stimulus to the contralateral half of the visual field relative to the vertical diameter of each eye (homonymous hemianopia). Image perception and fine analysis of it is done in psycho-visual area (Brodmann area 19), and object recognition, shape and size identification, the concept of space and understanding the significance of the written words is done in the visual-gnosis area (Brodmann area 19); in the same area is the oculocephalogyric cortical center that controls visual reflexes (cortical reflex stimulated by light).

The island is involved mainly in memory encoding and integration of sensory information (represented mainly by pain) with visceral response and, in particular, is involved in coordinating the cardiovascular responses to stress.

Brodmann areas 8, 5, 7 and 21 of cerebral cortex are cortico-cerebellar areas of coordination, being connected to cerebellum by cortico-ponto-cerebellar nerve fibers. Brodmann areas 5 and 7 (motor areas which correspond to posterior parietal cortex), which occupy large areas of superior parietal lobe, realize certain nerve background connections necessary to achieve movement in space. To achieve such movements in space, these areas need to compare a variety of nerve impulses in sensory systems, in order to create a space map, and at the same time, to calculate a trajectory through which the upper limb may touch a target. Brodmann area 5 receives extensive nerve projections from somatosensory cortex and the vestibular system, and Brodmann area 7,

process visual nervous information, which are related to perception of objects placed in space. Both areas have, mainly, nerve projections to the supplementary motor cortex and premotor cortex, and also have some nerve projections to the spinal cord and brainstem. It seems that Brodmann area 5 neurons are active only when the subject performs a movement of the upper limb to a specific object of interest; these neurons are not active when the same upper limb movement is executed without the object to be present. Thus, Brodmann area 5 neurons are activated only when exploring specific objects of interest (P. D. Cheney, 1985). A specific type of neurons corresponding to Brodmann area 7, which participates in eye-hand coordination, is activated strongly only when eyes and hands fixate a target and the hand reaches this target.

Cingulate motor cortex stimulation produce motor effects, and because of its proximity to the limbic cortex, the region may be involved in movements that have an intense emotional and motivational behavior.

Psychomotor areas of the cerebral cortex is planning and is programming the movement by planning the ideation plan of motric action in Brodmann area 40 (supramarginal gyrus) being transmitted in psychomotor centers which construct the movement engrams (Brodmann areas 6β and 8) and, finally, is being transferred to cerebral hemispheres motor areas of the same or opposite cerebral hemisphere through the corpus callosum.

Association areas of the cerebral cortex have links to other areas of the cerebral cortex, to association and reticulate thalamic nuclei, and from the latter one, to the brainstem reticular formation. These areas have function in physiological activity (as emotion, affection, psychological behavior), in intellectual activity (as prediction, memory, etc.), etc.. Parts of the association areas are found in the frontal lobe of the cerebral hemispheres which is showing functions in the control of apathy, sense of initiative, spontaneity (areas belonging to the external face of prefrontal lobes), euphoria, impulsiveness, bulimia, polidipsy, moral sense (orbital areas of frontal lobes), time and space disorientation, memory disorders (areas belonging to medial faces of frontal lobes), but also, in the temporal lobe of the cerebral hemispheres which has functions in controlling aggressive social behavior, affection, apathy, visual disorientation and visual-constructive disorders. In terms of psycho-motor, Brodmann area 39 contains nerve centers corresponding to the body scheme, where nervous information is associated for acknowledge of spatial position of body segments.

Vegetative areas of the cerebral cortex are still imperfectly located, knowing little about their functions. However, these areas control visceral functions and various psychological symptoms which are accompanied by various autonomic (vegetative) changes. Some believe that Brodmann area 6 controls sympathetic vegetative phenomena, and others believe that this area only controls gastrointestinal activity. Rate and amplitude of respiration and some vasomotor effects are controlled by Brodmann areas 13 and 14, blood pressure is controlled by Brodmann area 38, and abdominal visceral activity is controlled by nervous centers belonging to the island of Reil lobe cortex. Specialists' assumptions lead to the idea that vegetative areas and motor areas would intersect.

Other specialists have a hypothesis that motor control system is realized by the action of motor control systems consist of descendent parallel cortical nerve projections which is almost linking directly various motor areas of the cerebral cortex and spinal cord motor circuits. This hypothesis is supported by the fact that cortical stimulation of different locations can produce movements involving the same muscles or muscle groups, except that, according to the stimulation site, the characteristics of these movements are different.

From functional point of view all areas of cerebral cortex collaborate to organize cerebral processes. Also, the onset of certain neurological function is due to activation of cortical circuits between cerebral cortex and subcortical nuclei. Penfield, (1954), quoted by I. Petroveanu and N. Cozma, (1989), specifies that centrencephalic system (or midbrain) coordinates nervous activity of both cerebral hemispheres, through a feed-back nervous connection. Thus, the main role of centrencephalic system seems to sort, to organize and to plan the nervous information from the sensory cortical areas, leading to conscious awareness and to integrate and coordinate the development of movement plan which will be sent further to motor cortical areas.

Conclusions

By controlling the direction, velocity, position and force of movements, motor cortex seems to be primarily involved in space aspects of movements, but only in relations with other areas of the cerebral cortex, especially those who process sensorial stimuli and psychological information.

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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❖ SPORT AND HEALTH

RELATIONS BETWEEN BEHAVIORAL DISORDERS SELF-ASSESSMENT AND FREE TIME SPORTS' PRACTICE IN SCHOOL-AGED CHILDREN

BLAŽEVIĆ IVA[1], RADETIĆ-PAIĆ MIRJANA[1], BABIĆ VESNA[2]

Abstract

Purpose. The main goal of this research study was to establish the relations between the behavioral disorders self-assessment and the free time sports' practice in school-aged children and to determine sports' preferences in the boys and the girls.

Methods. Participants' sample consisted of 242 students who assessed behavioral disorders on a questionnaire using a 5 grades scale of Likert's type.

Results. The obtained results showed that there was a statistically significant relationship between free time sports' practice and behavioral disorders self-assessment in school-aged children, but however, there was not a statistically significant difference in sports' preferences between the girls and the boys.

Conclusions. Utilizing free time on extracurricular and unscholarly sports' activities has a great influence on a proper psychophysical development of an individual, and with that, also on prevention of risk factors' emergence that influence on behavioral disorders development.

Key words: school, students, sports, behavioral disorders.

Introduction

Different types and ways of child's reactions that are not in accordance with age, situational, environmental and other demands and expectations as assessed by specific environment, can be considered as behavioral disorders **(**M.Radetić-Paić, I.Blažević, V.Babić, 2011). Behavioral disorders connote adjustment or no adjustment to society demands and can represent a broad behaviors' specter; from relatively meaningless behaviors (shouting, cursing, anger and etc) to the more grave and serious ones (thefts, violent behaviors, drug use and etc.). Therefore, the behavioral disorders' assessment primarily depends on the so called social criterion (cultural, moral, economical and social development) and on the subjective standpoint of the social environment (primarily parents and teachers).

Different risk factors affect the emergence and the development of behavioral disorders, whereas knowledge on the risk factors is being applied in different conceptual prevention frames and behavioral disorders treatment in children. Planning of corresponding interventions depends primarily on recognizing the risk factors, that is, on recognizing the needs that contribute or facilitate behavioral disorders

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Received 11.03.2012 / Accepted 02.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

development in children. Interventions affect all developmental and nurturing aspects of a young person while respecting their rights and needs; in other words, the optimal conditions for development of all of their potentials are being created. The processes of planning and programming prevention and treatment interventions begin by recognizing risk factors and the needs of the specific local community. Local community should assume the responsibility for the early identification and intervention at the risk factors emergence which will decrease the risk for behavioral disorders apparition in children and youth.

The research studies have shown that failure in school accomplishments, poor academic achievements, discipline issues, and inadequate attachment to the school represent risk factors in behavioral disorders development in educational area (J.H.Williams, D.C.Ayers, W.M.Arthur, 1997), while more serious types of behavioral disorders in minors' felony offenders are present in an educational area, free time organization and association with delinquent individuals and groups (according to Schwalbe and assoc., 2008).

Free time activities, that is, sports, represent a very important nurturing activity and are an important factor for the proper psychophysical development of children. Engaging in sports' activities enables greater number of social contacts and contributes to the development of the social behavior in children. Lack of children's' free time activities' involvement is a risk factor for the emergence and development of behavioral disorders since it enables greater negative influence from the peers and other groups.

Research results on the relations between the organized sports' activities involvement and different aspects of the self opinion and behavioral disorders (V.Đonlić, O.Marušić-Štimac, S.Smojver-Ažić, 2005) show that successful athletes have significantly greater self-respect, perceived sports and social competency than the less successful athletes and non-athletes. Additionally, the successful athletes have significantly less pronounced internal, external and overall behavioral issues.

Ten-years long research which encompassed characteristics of school environment in children and youth such as disturbing behaviors in classrooms, disturbing behaviors in school surroundings, bad school accomplishments, peer related issues, teacher related issues and playing truant (M. Radetić-Paić, 2010) shows that more than the half of the participants has limited number of organized activities, that is, that they should use their free time better. More so, during the observed time period, the mentioned indicators for children and youth at risk or with already evident behavioral disorders were not changing.

Sports' activities preferences, as well as the differences between genders in sports' activities preferences have been widely investigated by many authors (M.Andrijašević, 2005; M.S.Hager, 2001; L.Myers, 1996; C.A.Oglesby, K.L.Hill, 1993; V.Petric, D.Novak, 2008; F.Prot, K.Bosnar, 2007.), who all claimed that there were sports more interesting to the male gender, sports with the equal interest of both genders, and sports more preferred by female gender; but also they claimed that there were differences in those preferences between populations.

Research studies on the boys and the girls show that there are differences in sports' preferences between genders (M.Cimerman, J.Cetinić, 2008). It was determined that the half of the boys is occasionally involved in some sports activity, while 38% of them are actively involved in sports' clubs even during summer holidays. In girls, 58% is occasionally involved in some sports activity, while only 25% of them is actively involved in sports' clubs. Boys are mostly (42,5%) involved in sports' games (basketball, soccer, handball, volleyball and etc.) and in individual activities (40%), but do not show interest in aesthetic activities (gymnastics, ballet, and etc.) and/or dance sports activities. Girls show the greatest interest in individual sports activities (45%) then dance and cheerleading (20%). Somewhat less interest (12,5%) girls show in aesthetic activities (gymnastics, ballet, and etc.), sports' games (7,5%) then martial arts, tennis and other sports (horse riding) (5%). Research studies' results on students' involvement in extracurricular and unscholarly activities (Ž.Šiljković, V.Rajić, D.Berić 2007) show the existence of the differences between genders. More girls than boys are involved in extracurricular and unscholarly activities, except for when it comes to sports activities.

Methods

Aim, purpose and hypothesis of the research

The aim of this research study was to establish the relations between behavioral disorders self-assessment and free time sports' practice in school-aged children and to determine sports' preferences in boys and girls.

The purpose of this research study was connected to planning of adequate interventions for elementary school children at risk for or with already evident behavioral disorders based on obtained indicators.

The following hypotheses were tested:

H1: there is a statistically significant relationship between free time sports' activities and behavioral disorders self-assessment in school-aged children,

H2: there is a statistically significant difference in sports preferences between school-aged girls and boys.

Sample of participants

Participants' sample consisted of 242 students of the 5th, the 6th, the 7th and the 8th grade from an

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elementary school in Pula. The participants' sample consisted of 121 girls and 121 boys.
The participants were distributed by grades:

- ✓ 54 5th graders (22,3%);
- ✓ 65 6th graders (26,9 %);
- ✓ 74 7th graders (30 6%);
- ✓ 49 8th graders (20,2%).

Sample of variables

Behavioral disorders were assessed by students on a Likert type of scale using 5 grades (1 –never, 2 – rarely, 3 – sometimes, 4 – often, 5 – very often). The students assessed if, during the last thirty days, they did actions that can be defined as behavioral disorders (problematic behavior), that is, minors' delinquency (deviant behavior). Behavioral disorders (problematic behavior) are defined on the bases of the few constructs that were shown in previous studies to be important for measurement of different ways of such behaviors. The scales were construed based on the same and/or adapted items from the similar scales) that were used in the similar investigations). In the final version based on the factorial analysis, two subscales were formed: Scale of the problematic behavior (6 items, α = .81) and Scale of the deviant behavior (3 items, α = .76), and two variables on students' assessment of cigarettes smoking and alcohol drinking frequency were added, which combined with the mentioned scales represents predictive group of variables.
Criterion variable refers to free time sports involvement (extracurricular activities).

Scale of the problematic behavior in school assessed:

1. Being malevolent to teacher
2. Destroying school's property
3. Teasing others
4. Mocking and pushing classmates
5. Making fun of others
6. Lying or making up to put others in trouble

Scale of the deviant behavior assessed the following variables:

1. Stealing from others
2. Shoplifting
3. Playing truant

Certain drug use experimenting was assessed by the following variables:

1. How often do you smoke?
2. How often do you consume alcoholic drinks?

Methods of data processing

Regression analysis was used to determine relations between free time sports' activities and the behavioral disorders self-assessment of school-aged children. To determine differences in sports preferences between the school-aged girl and boys, a univariate analysis of variance (ANOVA) was used.

Methods of data collection

This research study was done during 2011 in an elementary school in Pula, Croatia in a way that students filled out questionnaires independently.

Results and discussion

Regression analysis was done on a predictor group of variables consisting of the Scale of the problematic behavior and the Scale of the deviant behavior, and also of the two variables used to assess cigarette smoking and alcohol drinking frequency. Criterion variable is free time sports' activities (SPORT).

Table 1. Basic statistical values of the observed items

VARIABLE	MEAN	MINIMUM	MAXIMUM	SD
SPORT	4,01	1,00	5,00	0,96
MALEVOLENCE	1,74	1,00	3,00	1,10
DESTROYED	1,38	1,00	5,00	0,80
TEASING	2,01	1,00	5,00	1,10
BEAT/PUSHED	2,07	1,00	5,00	1,07
MOCKED	2,04	1,00	5,00	1,06
LIED	1,47	1,00	5,00	0,92
STOLE-PEOPLE	1,19	1,00	5,00	0,58
SHOPLIFTED	1,19	1,00	5,00	0,61
PLAYED TRUANT	1,33	1,00	5,00	0,75
SMOKE	1,17	1,00	5,00	0,62
ALCOHOL	1,38	1,00	5,00	0,78

Table 1. shows basic descriptive parameters of the analyzed variables. From the obtained values it can be noted that the average values in analyzed variables were different with specific deviation in a positive way in variable SPORT and BEAT/PUSHED, MOCKED AND TEASING as the negative forms of behavior.

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Table 2. Multiple regression coefficients of the predictor group of variables and criterion variable (SPORT)

	VALUE
MULTIPLE R	0,310
MULTIPLE R2	0,097
ADJUSTED R2	0,053
F (11,227)	2,229
P-LEVEL	0,000

Multiple regression analysis results (*Table 2.*) show statistically significant relations between predictor and criterion variables. Multiple correlation (R=0, 31) is statistically significant with the conclusion error of 0, 05, but however, only 10% of criterion variable variance is possible to explain by the applied group of predictor variables.

Table 3. Multiple regression analysis for criterion free time sports' activities (SPORT)

VARIABLE	Beta	St.Err. of Beta	B	Std.Err. of B	t(219)	p-level
Intercept			***4,311***	***0,192***	***22,397***	***0,000***
MALEVOLENCE	0,074	0,088	0,064	0,076	0,847	0,398
DESTROYED	-0,036	0,092	-0,043	0,109	-0,392	0,695
TEASING	0,186	0,115	0,161	0,099	1,621	0,107
BEAT/PUSHED	-0,173	0,090	-0,155	0,081	-1,917	0,057
MOCKED	0,019	0,095	0,017	0,086	0,203	0,839
LIED	-0,046	0,080	-0,047	0,083	-0,575	0,566
STOLE-PEOPLE	0,102	0,078	0,168	0,130	1,298	0,196
SHOPLIFTED	0,037	0,075	0,058	0,117	0,497	0,620
PLAYED TRUANT	-0,049	0,086	-0,062	0,109	-0,569	0,570
SMOKE	***-0,200***	***0,081***	***-0,309***	***0,125***	***-2,471***	***0,014***
ALCOHOL	-0,087	0,079	-0,107	0,098	-1,099	0,273

Standard regression coefficient is the highest and statistically significant in the SMOKE variable. Other predictor's items contribute to criterion definition but are not statistically significant for the prediction of the criterion variable. The negative algebraic sign of the standardized regression coefficient denotes negative influence of an individual predictor on a criterion variable. All in all, variable SMOKE contributes, in the negative meaning, the most with its' projections to the criterion variable SPORT, whereas other individual items do not significantly predict criterion of the free time sports' practice.

This means that children who consume cigarettes spend less time in free time sports' activities.

Considering the obtained results of the multiple regression analysis, H1 hypothesis on the existence of the statistically significant relation between free time sports' activities and behavioral disorders self-assessment can be accepted.

Table 4. Boys' and girls' involvement in extracurricular sports' activities

BOYS (14%)	
SPORT-SCHOOL	**%**
SOCCER	4,96
BASKETBALL	5,79
HANDBALL	3,31
GIRLS (38%)	
SPORT-SCHOOL	**%**
DANCE	9,92
VOLLEYBALL	25,62
BASKETBALL	1,65

According to the percentages' results of extracurricular sports' activities it can be concluded that girls are involved in extracurricular sports' activities in greater number (38%) than the boys are (14%). The greatest interest in the girls was volleyball (25, 62%), dance (9,91%) and basketball (1,65%). Boys prefer basketball (5,79%), soccer (4,96%) and handball (3,31%).

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Table 5. Boys' involvement in unscholarly sports' activities

BOYS (75%)	
SPORT-CLUB	**%**
TRACK AND FIELD	0,83
SOCCER	23,14
DANCE	4,13
BASKETBALL	7,44
SWIMMING	3,31
HANDBALL	4,96
TABLE TENNIS	3,31
TENNIS	6,61
MARTIAL ARTS	6,61
SAILING	1,65
ROWING	5,79
CARTING	0,83
CYCLING	0,83
HORSE RIDING	1,65
WATERPOLO	4,13

Obtained results on boys' involvement in unscholarly sports' activities show that great number of boys (75%) is practicing some of the mentioned unscholarly activities in free time. The greatest interest in boys is directed towards soccer (23,14%), basketball (7,44%), tennis and martial arts (6,61%), while the boys show the least interest in track and field, cycling and carting (0,83%).

Table 6. Girls' involvement in unscholarly sports' activities

GIRLS (55,4%)	
SPORT-CLUB	**%**
TRACK AND FIELD	5,79
DANCE	14,88
VOLLEYBALL	9,09
BASKETBALL	1,65
SWIMMING	3,31
HANDBALL	3,31
TENNIS	1,65
MARTIAL ARTS	4,13
ROLLER SKATING	4,13
SAILING	0,83
ROWING	0,83
GYMNASTICS	4,13
HORSE RIDING	1,65

According to the obtained results of girls' involvement in unscholarly sports' activities it can be concluded that less number of girls (55,4%) is practicing some of the unscholarly activities in free time compared to the boys (75%). The greatest interest in girls is directed on dance (14,88%) and volleyball (9,09%), while girls show the least interest in sailing and rowing (0,83%).

Table 7. Differences between the boys and the girls in the variables free time sports' practice (SPORT), participating in extracurricular (SPORT-SCHOOL) and unscholarly sports' activities (SPORT-CLUB)

VARIABLES	SS Effect	df Effect	MS Effect	SS Error	df Error	MS Error	F	p
SPORT-SCHOOL	32,128	1	32,128	609,275	65	9,373	3,428	0,069
SPORT-CLUB	8,270	1	8,270	7149,351	167	42,810	0,193	0,661
SPORT	3,251	1	3,251	216,732	239	0,907	3,585	0,060

According to the results of the univariate analysis of the variance it can be stated that the girls and the boys are not statistically significant different in practicing free time sports' activities, as well as in the extracurricular and unscholarly sports' activities.

The results on the percentages of children's involvement in extracurricular and unscholarly activities show that the girls are more involved in offered extracurricular activities (38%) compared to the boys (14%), while the situation is reversed for the unscholarly activities. Relatively greater number of boys (75%) is involved in some form of extracurricular sports' activities compared to the girls (55,4%). Boys mostly prefer soccer, basketball, tennis, and martial arts while the girls prefer volleyball and dance. Obtained results confirm the findings of the previous investigations according to which there are differences among genders, but however, in this research study, those differences did not show to be statistically significant. Therefore, the H2 hypothesis on the existence of the statistically significant differences in sports' preferences between school-aged boys and girls can be rejected.

Conclusions

Organized free time sports' practicing through extracurricular and unscholarly activities has a great influence on the proper psychophysical development of an individual, as well as on the prevention of the emergence of the risk factors that influence on the behavioral disorders development. Involvement in sports' activities enables for greater number of social contacts and contributes to the development of the social behavior in children. The lack of children's involvement in free time sports' activities is a risk factor for emergence and development of behavioral disorders since it enables greater negative peers' and other groups' influence on a child.

This research was conducted with the goal to determine if there was a relation between free time sports' activities involvement and the behavioral disorders self-assessments of 242 school-aged participants, as well as with the goal to determine sports' activities preferences in the boys and the girls. The obtained results show that there was a statistically significant relation between free time sports' activities involvement and the behavior disorders self-assessments of school-aged children, but however, there was not a statistically significant difference in sports' activities preferences between the girls and the boys. The greatest interest of boys was directed towards soccer (23,14%), basketball (7,44%), tennis and martial arts (6,61%), while the least interest was directed towards track and field, cycling and carting (0,83%). The girls' greatest interest was directed towards dance (14,88%) and volleyball (9,09%), while the girls showed the least interest in sailing and rowing (0,83%).

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LATERALITY - DETERMINANT FACTORS AND INFLUENCES

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Abstract

Environmental factors or genetic instructions seem to be two processes that can cause variations in the upper and/or lower limb preference. Preferential use of the upper and/or lower limb in moderate or high (sport performance) intensity physical exercise can cause an unbalanced muscle behavior (especially in terms of force) between the right and left side of the body, which can have undesirable implications on normal development of the human body. In other words, asymmetrical sports specific biomechanics may predispose the subject to neuromuscular disbalances. Therefore, understanding laterality determining factors and influences may lead to a better knowledge of this phenomenon.

Key words: laterality, preference, dominance, right, left.

Introduction

From anatomically and functionally point of view, people present two identical external anatomical halves centrally merged. Even if the two external anatomical halves are identical, people give a greater preference to one of the body sides or to one of the upper and/or lower corresponding limbs (B. J. C. Perera, 2009). Fundamental basis of this perception is represented by the concept of laterality.

Laterality is defined as functional inequality of a body part as a consequence of the difference in development and distribution functions in the cerebral hemispheres. Therefore, functional weight of a pair limb or organ is called "laterality", and is manifested by the fact that humans execute certain activities with more pleasure, skill, efficiency, ease and speed, with one pair of limbs or organs, giving a systematic priority to it (K. Mekota, 1976).

Laterality is linked to a dominant cerebral hemisphere function that causes inequality of the body left and right halves. Sensory asymmetry phenomenon seems to be innate and is based on a certain functional organization of brain structures. Cerebral dominance is one of the most often used factors to explain laterality and especially to explain the hand dominance. It appears that hereditary and cultural mechanisms are indispensable, and work together in determining laterality.

In this study, laterality determining factors and influences are examined in detail, to a better understanding of this phenomenon.

Laterality reflection in the cerebral hemispheres

In right-handed adult subjects, left cortical motor area controls the right upper limb and in left-handed adult subjects, right cortical motor area controls the left upper limb. The cerebral hemisphere that controls language is called the dominant hemisphere. In the vast majority of people, language functions are processed in the left hemisphere. Brain lesions that adversely affect language are found in the hemisphere in about 95% of cases, as evidence of left brain dominance (D. E. Haines, 2008). About 90% of right-handed subjects have nerve centers that control speech located in the left hemisphere, and the remaining 10% have nerve centers that control speech located in the right hemisphere. Also, about 65% of left-handed subjects have nerve centers that control speech, located in the left hemisphere, 20% have nerve centers that control

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Received 10.03.2012 / Accepted 12.08.2012

speech, located in the right hemisphere, and the remaining 15% have nerve centers that control speech, located in both cerebral hemispheres. 60% of ambidextrous subjects have nerve centers that control speech, located in the left hemisphere, 10% have nerve centers that control speech, located in the right hemisphere, and the remaining 30% have nerve centers that control speech, located in both cerebral hemispheres (C. R. Noback et al., 2005). D. E. Haines, (2008), speculates that almost all right handed subjects and about half of left handed subjects are left cerebral dominant. So, the right cerebral hemisphere, in most of general population, is the nondominant hemisphere.

Observations realized by autopsy have shown that larger and more numerous groups of nerve bundles connect both cerebral hemispheres in left-handed subjects, then right-handed subjects, suggesting that more nerve impulses are traveling between cerebral hemispheres in left-handed subjects.

Hand position during writing correlates with cerebral dominance. Subjects, who write by hand in a non-inverting position (normal), present cerebral dominance in opposition to preferential utilization of the upper limb. Thus, a large number of subjects with right upper limb preference present left cerebral dominance and only a small number of subjects with left upper limb preference present left cerebral dominance. Also, individuals who write by hand in an inverted position, have cerebral dominance in the same side as the upper limb preference. Thus, a large number of subjects with left upper limb preference present left cerebral dominance and a very small number of subjects with right upper limb preference present right cerebral dominance. Cerebral dominance cannot be determined in some subjects, by observations of hand writing position, probably because of the cerebral hemispheres interconnection (J. G. Creager, 1992). Subjects, which have the right part of the body dominant, have a higher metabolic activity in the left hemisphere, and subjects, which have the left part of the body dominant, have a higher metabolic activity in the right hemisphere (R. C. Gur and M. Reivich, 1980). Also, R. C. Gur et al., (1982) showed that the direction and degree of hemispheric asymmetry of cerebral blood flow are influenced by gender and upper limb preferential use.

Factors influencing laterality

Genetic instructions appear to be identical for both parts of the body (right and left), differences appeared when decoding these instructions to muscles, nerves, blood distribution and other characteristics required for organs functions. The additional specific influence on human brain asymmetry is characterized by the presence of RS+ gene (Right Shift) to most people, which induces a typical cerebral specialization manifested by an advantageous functionality of the left hemisphere and a weaken functionality of the right hemisphere. The effect of this gene, in the physical asymmetry of the upper limb and brain, is expected to be cumulative. This gene does not lead directly to preferential use of upper limb, but is more likely to improve, at higher levels of skill, the functionality of the right side. However, the functional effect of RS+ gene presence is expected to be the lateralization of speech in the left hemisphere (M. Annett, 2006). Also, RS+ gene is present in approximately 80% of the population, in which are included the monozygotic and, also, dizygotic twins. However, approximately 18,5% of the population is expected to have a genotype RS-- and develop a cerebral specialization at random, and 8-10% of the population is expected to have an RS++ genotype (M. Annett, 2003).

Preferential use of the upper limb is important in genetic theories of asymmetry, because of the distinction between monozygotic twins, which are actually genetically identical, and dizygotic twins, who share on average 50% of genes. Thus, a study by A. Davis and M. Annett, (1994), found that the preferential use of left upper limb is significantly more pronounced in twins subjects (almost in the same proportion in monozygotic twin pairs and dizygotic twin pairs) (I.C. McManus, 1980; N. L. Sicotte et al., 1999; M. Annett, 2006), reported to single born subjects, in male subjects compared to female subjects (J. F. Orlebeke et al., 1996; M. Reiss and G. Reiss, 1997) and also in young subjects compared to adult subjects (A. N. Gilbert and C. J. Wysocki, 1992). In contrast, D. Gidu, (1998), in a study of 16 female subjects and 16 male subjects, aged between 9 and 12 years, showed that male subjects have a right preponderance stronger than female subjects. Also shown in the same study, there is no correlation between hand preference and muscle fatigue model installation.

A. Davis and M. Annett, (1994), found in a study of 30 000 subjects, aged between 18 and 80 years, that preference of left upper limb in single born subjects is about 7.1%, and in twin subjects is approximately 11,7%. Differences in upper limb preference are due to environment influences (J. F. Orlebeke et al., 1996; K. Tambs et al., 1987), because these differences are mainly attributed to disturbances occurring in the early development of the subjects. However, this does not directly involve the idea that, there is not a genetic influence in determining the preference in using the upper limb.

Preferential use of left upper limb is associated with neurological development problems, which includes learning disabilities (dyslexia), mental retardation, autism, schizophrenia (M. Cannon et al., 1995) and epilepsy (F. H. Previc, 1996). Many neurological development problems

associated with preferential use of left upper limb are more common in male subjects.

Corresponding right hand thumb sucking was observed in approximately 90% of fetuses and corresponding left hand thumb sucking was observed in approximately 10% of fetuses in week 15 of intrauterine development. The same subjects, after 10-12 years of age (after birth), showed a remarkable correlation of hand preference with intrauterine hand preference behavior. From the 60 fetuses, which sucked the right hand thumb, only one has written with the left hand and from the 15 fetuses which sucked the left hand thumb, only 7 have written with the left hand. Male fetuses, which sucked the left hand thumb, tend to use preferentially the right hand in adolescence compared to female subjects (P. G. Hepper et al., 2005). P. G. Hepper, S. Shahidullah, R. White, (1991), have observed using ultrasound, that 92% of fetuses who sucked the thumb, tend to suck more often the thumb corresponding to the right hand, this value being very close to the value of the upper limb preferential use in general population (89% of adults write and throw with the right hand) (A. N. Gilbert and C. J. Wysocki, 1992). P. G. Hepper, G. R. McCartney, E. A. Shannon, (1998) have shown that fetuses, situated in week 10 of intrauterine development, have moved more often the right upper limb (85% of fetuses), then the left upper limb, and also, 75% of fetuses showed a preference for the right upper limb. Thus, the main implication of RS (Right Shift) theory is that, the mechanism that induces preferential change to the right is operating in very early stages of human development, even before the development of the cerebral cortex.

C. S. Williams, K. A. Buss, B. Eskenazi, (1992) have shown that births performed with complications (twins or triplets, which required resuscitation after birth) seem to increase the probability of preference in the use of left hand and leg. Also, low weight at birth is associated with an increased probability of left hand preferential use, due to intrauterine growth disturbances recorded in twins, which is valid only for the first born of twins pair (J. F. Orlebeke et al., 1996).

Genes responsible for the use of hand preference are sometimes transmitted to offspring (sons and daughters), and sometimes not, all of this offering the basic transmission of hand preference in family (N. L. Sicotte et al., 1999; J. F. Orlebeke et al., 1996). Fathers, with left hand preference do not affect the probability of left hand preference transmission to daughters. Also, the incidence of left hand preference in daughters, does not increase, even if the father has left hand preference (both parents have left hand preference). On the other hand, the sons seem more susceptible to have preference in using the left hand, if the fathers have preference in using left hand (J. F. Orlebeke et al., 1996).

Approximately 80% of adult subjects have right upper limb dominant, 10% left upper limb dominant (C. Hardyck and L. F. Petrinovich, 1977) and 10% are ambidextrous (C. R. Noback et al., 2005). Also, I. C. McManus, (1991), concluded that about 8% of people have left upper limb dominant. M. Reiss and G. Reiss, (1997), in a study of 506 male subjects and 430 female subjects, showed a higher preference in using the right upper limb in a percentage of 91% and a preference in using the right lower limb in a percentage of 74%; the incidence correlation of laterality between the two limbs (upper and lower), was 0.44.

C. Gabbard, (1992), in a study conducted on a group of children aged between 3 to 5 years old, showed that 52% of subjects had the right upper and lower limb dominant and 23% of subjects had the right upper limb dominant and lower limbs without dominance (mixed-use preference). I. Nachshon, D. Denno, S. Aurand, (1983) showed that approximately 80% of 7364 children (of different races and sexes) had preferences in use for the right upper and lower limbs. Also, no significant differences between races and sexes, was registered for the preferential use of right and left limbs. C. Gabbard, (1993) showed that, for subjects aged between 3 to 11 years old, the dominance of lower limb is not pronounced, and almost twice the number of subjects with not pronounced dominance of lower limb present mixed preferential use of the lower limbs. Studies on populations of adult subjects have shown that a higher proportion of subjects with right upper limb dominance present the same lower limb dominance, then subjects with left upper limb dominance, which also present left lower limb dominance.

C. Gabbard and M. Iteya, (1996) concluded, after reviewing 14 studies, that the percentage of children without lower limb dominance is substantially higher than the percentage of adult subjects without lower limbs dominance. The number of children without lower limb dominance is about two times higher than the number of children without upper limb dominance, fact found in adolescents and adults, but with a smaller difference. However, in the late adolescence, there is a significant shift to the right in dominance, followed by a relative stabilization of this behavior. Other studies have shown that adult subjects show a significant switch from the left dominance or no dominance of the lower limbs, to the right lower limb dominance (J. Bell and C. Gabbard, 2000), fact suggested by C. Porac, (1996), but for upper limbs. Also, the incidence of preferential use of left upper limb decreases, more or less linearly with age, in both sexes (A. N. Gilbert and C. J. Wysocki, 1992).

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

Sociocultural differences between countries or geographical regions further complicate the explication of data for the preferential use of upper or lower limbs. Thus, in Western cultures since the beginning of last century, the preferential use of left hand was considered undesirable and therefore the students who preferentially used the left hand were often forced to write with the right hand. With time, obligatory use of right hand has dropped dramatically, increasing the number of subjects who used the left hand preference, from about 3% in 1910 to 12% in subjects born after World War II. However, marked cultural differences remained on the preferential use of left hand; for example, the incidence of preferential use of left hand extends from about 2.5% in Mexico to about 12% in Canada (I. B. Perelle and L. Ehrman, 1994). Other studies showed a preferential use of left hand of 11.5% in Canada and England, 7.5% in UAE, 5.8% in India, 4% in Japan, 7.9% in Côte Ivory and 5.1% in Sudan. However, cultural differences in the incidence of left hand preferential use are not strong enough to justify such data. Studies on Asian population born in the west, shows the same levels of incidence in left hand preferential use, as the Asian population born in Asia. These facts strongly support the idea that subjects have preferential use of left hand or right hand, because of their genes which each possess (I. C. McManus, 2002).

Variations in preferential use of the upper and lower limbs, genetically determined, influenced by environment, influenced by cultural trends, influenced by development or influenced by combinations of these, remain highly controversial in the literature (K. N. Lalande et al., 1995).

The upper and lower limb dominance effect on muscle strength balance in sports

Dominance of the upper limb has a higher impact, than the lower limb dominance in the development of spine muscle strength, in sedentary people. It is well known that most complex and diverse movements are performed with the upper limbs, than lower limbs which mainly present symmetrical movements (except the movements which are made by playing a sport).

Thus, E. Andersson, L. Swärd, A. Thorstensson, (1988), found significant differences in maximum isometric strength production in movements of flexion, extension and lateral flexion between athletes (football players, wrestlers, tennis players and gymnasts) and sedentary subjects (all subjects were aged between 18 and 22 years old). Also, in the right and left lateral flexion movements, wrestlers and tennis players developed an isometric strength significantly higher in the non-dominant side of the trunk (represented also by the non-dominant upper limb). These differences present between athletes and sedentary subjects seem to be related to the specificity of sport and also due to long-term training systematically practiced.

It seems that tennis specific biomechanics predispose the player to back spine neuromuscular disbalances (significant differences between the right and left side of the lumbar extensor muscles), closely correlated with the dominant upper limb used in tennis game practice. These disbalances can be corrected by applying an exercise program for the lumbar muscles (E. Andersson et al., 1988; T. Renkawitz et al., 2008). Another aspect of handedness in tennis postulate the idea that 90% of the time left handers have to play against right handers and 10% of the time right handers have to play against left handers. Therefore, the left handers back-hand strokes are stronger because they have to face 90% of time to fore-hand strokes generated by right handers. Also, fencing is another sport where left handers show signifiant dominance against right handers.

It seems that athletes who systematically practice handball and track and field (triple jump) are likely to develop maximum isometric force disbalances of antagonistic muscles necessary to realise the movements in frontal (lateral flexion) and/or transverse (lateral rotation) plane at the level of the spine, due to preferential use of one of the upper and/or lower limb.

S. Parkin, A. V. Nowicky, O. M. Rutherford, A. H. McGregor, (2001), in a study of 19 rowers and 20 control subjects (almost identical in terms of age, body height and weight), have found that asymmetric myoelectrical activity observed between right spinal extensor muscle and left spinal extensor muscle, necessary to execute extension movement, significantly correlates with the part in which the rower is paddling. Although, the maximum isometric force exerted by trunk extensor and flexor muscles, is not different between control subjects and rowers, the myoelectric activity was significantly higher in rowers than control subjects.

Therefore, the subjects who practice sports whit asymmetrically movements will develop a higher strength of one side of the body or one upper and/or lower limb according with theirs preferential use of one of the upper and/or lower limb.

Conclusions

Variations in preferential use of the upper and lower limbs seem to be genetically determined, as a result of genes which each possess or seem to be determined by environmental factors. Further studies are necessary to assess the current outcome of this statement.

It seems that neuromuscular disbalances between right and left parts of the body are closely correlated with the dominant upper or lower limb

used in sports practice. So, sports specific asymmetrical biomechanics predispose the player to neuromuscular disbalances.

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Vol. XII, ISSUE 2 Supplement 2012, Romania
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COMPARATIVE STUDY CONCERNING THE BALANCE DEVELOPMENT AT ADULTS BY MEANS SPECIFIC TO SPORT GAMES

VAIDA MARIUS[1]

Abstract:

Purpose. The present study is a continuation of a research conducted in 2009/2010 and wants to prove that, if we include means specific to sports (handball, basketball, volleyball, football) in every physical education lesson, than we will accomplish, in addition to developing various psychomotor skills and education of motor tool-applied skills - balance, an ensuring a level of training appropriate to its current requirements and objectives, even if the subjects are adults, the advantage being that its development can be achieved with relatively low equipment material condition.

Methods and procedures. This study was conducted over a period of one academic year (2010-2011) at the Petroleum - Gas University of Ploiesti, and was performed on a total of 80 students, 40 boys and 40 girls, divided into four groups, two experimental formed by 20 students (20 boys and 20 girls) and two control groups consisting also of 20 students (20 boys and 20 girls). The present experiment was based on the balance test with the device in the form of a "T".

Results. Analyzing statistical data obtained in the two years of experiment we can say that the evolution of subject experiment groups is comparable, in most cases, the averages and amplitude obtained having a higher evolution in the second year of experiment, but also having cases when the averages and amplitude values lower in 2010/1011 opposed to 2009/2010, these cases being rare.

Conclusions. The results obtained show that compared with traditional methods of balancing development, sports specific games methods are of at least equal importance to them in improving balance, as evidenced by the results. Also, one can say that there is a link between motor skill improvement - balance and the increased general training by means of specific sports games.

Keywords: balance, adult, sports games

Introduction

Balance is part of the utility-applied motor skills group being very important as a completion of some of the qualities that are designed to maintain stability through moving the body or holding it in different positions. As you know this skill can improve in almost any equipment material condition. Within an individual's lifetime this habit is formed, developed and educated. In this study the focus is on educating balance by specific sports, knowing that through education of balance, education and development of self is also achieved, the development of space orientation of the body and its segments, posture and

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Received 01.03.2012 / Accepted 2.08.2012

static-kinetic reflexes development etc..

The hypothesis that I started for this study was that, if we include every physical education lesson specific means sports (handball, basketball, volleyball, football) we achieve a better matching, superior to students undergoing classical curriculum, providing a requisite level of development and current objectives, even if subjects are of adult age. The stages through which the training and development (education) that motor skills are: familiarity with the motor act phase, learning stage or analytical segmentation, organization and systematization stage, stage grouping and stage automation and improvement (Gh. Mitra, Al. Mogoş, 1975, C., Bota, 2000, E. D., Colibaba, I.,Bota, 1998).

Developing balance is achieved by performing motor duties while traveling in balance, by increasing or decreasing the number of points of support, gradually decreasing support base, changing the direction of movement in balance, gradual ascension of the support surface (M., Ifrim, 1986, R., Manno 1996).

This study aimed to establish a methodology system of action, based on different means specific to sport games and their introduction in the physical education classes with students, having as finality, in addition to the motor capacity development, the education of balance.

Motor skills development is a conditional reflex activity, and it's based on repeated interaction between excitations - kinesthetic, visual, auditory cortex with the same intensity transmitted in the same order and the balance is a polyvalent skill that relies on the finesse of the kinesthetic sense and also on the coordination of muscle groups that based on the specific motor actions restore body stability, both statically and dynamically.

Materials and methods

The research that formed the basis of this study was conducted over a period of one academic year (2010-2011), being the continuation of a study from the academic year of 2009-2010 at the Petroleum - Gas University of Ploiesti, and was conducted on a number of 80 students, 40 boys and 40 girls, divided into four groups, two experimental and two control groups each consisting of 20 students (20 boys and 20 girls).

Subjects in the experimental groups have used means specific to sports games that also aim at motor skill improvement - balance in each lesson, while those in the control groups went through physical education classes under the existing program.

The results were compared with results obtained in 2009/2010, when the experimental group used a series of specific means of improving the balance among which applicative tasks containing balance exercises, static exercises (leg sweep on the ground and on the gym bench with carrying side arms - top, back, standing on one foot on the ground with the other one in different positions, standing on the shoulder blades with arms outstretched on the ground obliquely, raising and maintaining vertical feet for 15 sec., the balance with one foot on the ground and gym bench with carrying the arms sideway - up, back, etc.) and dynamic exercises (walking on a line on the ground, walking on the tips of the feet on the narrow side of the bench walking on the gym back with moving arms, front or back controlled running on the bench gym etc).

Continuing the previous study we wanted to see if there is any difference between using methods specific to the balance development and using the methods specific to the sport games that aim at balance development.

From sports specific methods used in the academic year 2010/2011 I mention:

Handball:

- Successive static jumps or moving jumps, with the handball ball in the hands (between the ankles).
- Throwing at the goal while jumping (or jump over the gymnastics bench), with changes of direction and no change of direction, with or without performing double leg jumping left or right.
- Passing the ball while running, throwing and landing procedures under different balances.
- Leaped step while carrying the handball ball forward - up, jumped leaped step carrying the ball to the chest with maintaining a balanced position in the phase of flight and landing.
- Exercises regarding goalkeeping and blocking throws.
- Themed game etc.

Basket:

- From standing, or fundamental position - lateral, vertical, anterior-posterior balance.
- From fundamental position - imbalances.
- From standing, jumping with landing in fundamental position.
- Sitting with the ball held between your ankles - jumping with knees to the chest.
- Themed game.
- Sitting with the ball held between your ankles - jumping as the ball on the distance of 15-20 m to maintain a balanced position.
- Exercises that target learning stops, pivoting, etc..
- Various exercises that include changes of direction, dribbling, passing, jumping on one foot or two feet, throwing at the basket, etc..

Football:

- Jumping while ball striking with the head imitation.
- Individual, hanging ball, hitting the ball with the head from standing or from shifting position and landing with maintaining a balanced position.
- Hitting the ball to the wall and stopping it from rebound with the left or right foot.
- Passes in three or four from running in line with increased stopping and taking over the ball.
- Bilateral themed game.

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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- Exercises that include turns, stopping and taking the ball through the counter-blow or depreciation etc.

Volley:

- Exercises aiming at the fundamental position (high, medium, low).
- Passing of volleyball while jumping over the net and landing in fundamental position.
- Exercises designed for field shifting, service from front down and up, attack hit and block.
- From squatting in pairs, disrupting the partner from the squat position jumping and pushing in the hands.
- Imitation of the attack hit for the entire length of the field (take off, jumping, hitting, landing) with emphasis on achieving fair and balanced landings.
- Jumping on one leg, two legs, trunk extension from squat with the volleyball in their hands.
- Successive attacks from passes "rising" with withdraw.
- Complex exercises to attack and block, etc..

The test which was at the basis of this experiment was the balance test with the device in a "T" shape. Through the balance test (ECH) was measured the ability to maintain balance on a device known as a "T" which stands as an inverted "T" on the ground. This device consists of a vertical plate with a width of 2 cm., length 61 cm. and 4 cm height., and a horizontal plate, the vertical plate being in the middle, which has a length of 61 cm. and width of 35 cm. Subject under experiment climbs with one leg on the device with the hands on hips and looking to maintain the balance on the device as long as possible (Figure 1). Time is measured until the subject falls off the device, touches the ground with the free foot or raises the hands on his hips. The time resulted is expressed in seconds, the test being carried out both with the left foot and whit the right.

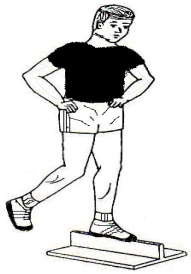

Figure 1. Device in a "T" shape for measuring the maintaining of the balance capacity

The methods used for this study were: bibliographic study method, measurement and recording method, experimental method, statistical and mathematical method and graphic method, and the statistical and mathematical indicators which were the basis for data processing were: arithmetic mean, median, upper limit (X_{max}), the lower limit (X_{min}), quartiles, range (W), standard deviation (S) and coefficient of variation (CV).

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The obtained results and their interpretation

The conducted experiment is found as statistical data in tables 1, 2, 3 and 4 where the statistical calculations of initial and final values of the balance test for the two groups (experimental and control), for boys and girls, both the right leg and left leg, are presented in the two years. Also, the means from statistical calculations are presented graphically in Figures 2-5, both from the year 2009/2010 and the year 2010/2011

Table 1. Statistical values of the balance test – boys – the experiment group

	Experiment group							
	2009/2010				2010/2011			
	TI		TF		TI		TF	
Number	20		20		20		20	
	St.	Dr.	St.	Dr.	St.	Dr.	St.	Dr.
Arithmetic mean	5,55	6,75	13	14,6	6,4	5,9	14,8	14,05
Minimum	3	3	8	7	2	2	8	9
Maximum	11	18	18	22	10	11	19	20
Amplitude	7,45	7,85			8,4	8,15		
Median	5	6	14	15	6,5	5,5	16	15

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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Lower quartile	4,75	4	10,75	13	5	5	14,75	13
Upper quartile	6	8	15	16	8	7	17,25	17
Standard deviation	1,82	3,86	2,83	3,27	2,21	2,02	2,58	2,52
Coefficient of variability	32,79	57,25	21,75	22,37	34,53	34,30	16,37	16,76

Table 2. Statistical values of the balance test – boys – the control group

	Control group							
	2009/2010				2010/2011			
	TI		TF		TI		TF	
Number	20		20		20		20	
	St.	Dr.	St.	Dr.	St.	Dr.	St.	Dr.
Arithmetic mean	5,6	6,05	7,35	7,9	6,35	6,15	7,95	8,65
Minimum	3	2	4	4	3	2	4	3
Maximum	16	13	17	15	13	11	18	17
Amplitude	1,75	1,85			1,60	2,50		
Median	5	5,5	7	7	5	6	7,5	9
Lower quartile	3,75	3	5,75	5	4	5	5,75	7
Upper quartile	6	8	8	8,25	7,5	8	9	9,25
Standard deviation	2,94	3,17	2,94	3,30	3,17	2,08	3,85	3,048
Coefficient of variability	52,59	52,40	40,04	41,86	49,87	33,89	48,54	35,24

Table 3. Statistical values of the balance test – girls – the experiment group

	Experiment group							
	2009/2010				2010/2011			
	TI		TF		TI		TF	
Number	20		20		20		20	
	St.	Dr.	St.	Dr.	St.	Dr.	St.	Dr.
Arithmetic mean	5,35	4,5	11,25	12,65	5,75	5,65	11,9	13,4
Minimum	2	2	6	9	2	3	5	9
Maximum	25	12	25	16	19	14	23	18
Amplitude	5,9	8,15			6,15	7,75		
Median	4	4	10,5	13	5	4,5	13	13
Lower quartile	3	3	9,75	11	3,75	4	10,75	11,75
Upper quartile	5,25	5	13	14	6,25	7	14	15
Standard deviation	4,93	2,164	4,02	1,95	3,69	2,80	3,69	2,30
Coefficient of variability	92,22	48,09	35,77	15,44	64,3	49,49	28,66	17,18

Table 4. Statistical values of the balance test – girls – the control group

	Control group							
	2009/2010				2010/2011			
	TI		TF		TI		TF	
Number	20		20		20		20	
	St.	Dr.	St.	Dr.	St.	Dr.	St.	Dr.
Arithmetic mean	5,75	6,2	7	8,1	6,05	6,85	7,95	8,9
Minimum	2	2	3	3	3	2	4	4
Maximum	17	15	19	18	15	15	17	17
Amplitude	1,25	1,9			1,9	2,05		
Median	5	5,5	5,5	7	5,5	6	7	9

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Lower quartile	3	3	5	5,75	4	5	5,75	6,75
Upper quartile	7	9	8,25	10	7,25	8	9	10,25
Standard deviation	3,66	3,59	3,87	3,71	2,76	3,23	3,48	3,17
Coefficient of variability	63,80	57,94	55,42	45,82	45,65	47,19	43,85	35,69

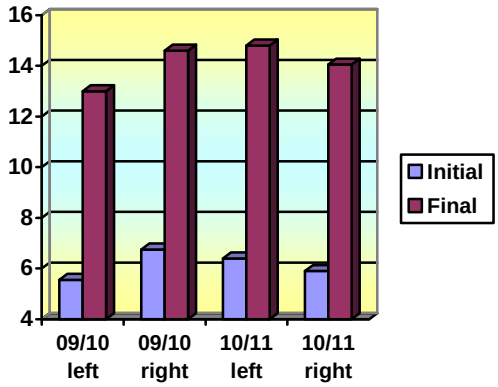

Figure 2. Medium values at the balance test Boys - experiment group

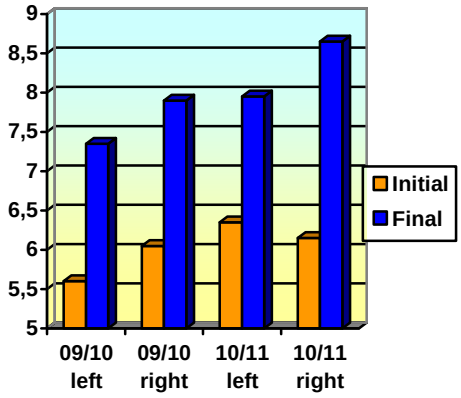

Figure 3. Medium values at the balance test Boys – control group

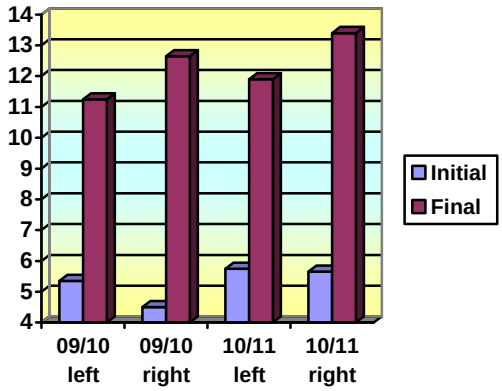

Figure 4. Medium values at the balance test Girls - experiment group

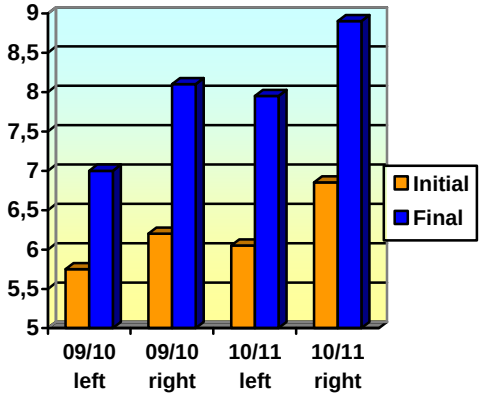

Figure 5. Medium values at the balance test Girls – control group

From the above tables and figures we can see the differences between the means at the test done, both for boys and girls, the differences being presented on the two years in which the experiments were conducted.

After analyzing and interpreting statistical indicators it can be said that in both years (2009/2010 and 2010/2011) there was a higher evolution in the experimental groups (boys and girls) compared with control groups.

At boys, at the experiment group that made progress in 2010/2011 was higher than in 2009/2010 for both feet, this growth was of 8.4 sec. to 7.45 for the left leg, and 8.15 in comparison with 7.85 sec. for the right leg. Also there is a reversal of values at initial and final tests in the two years of study, if in 2009/2010 the values for the right foot were higher than those of the left leg, both in the final and initial testing, in 2010/2011 we notice that those from the left leg are superior to those of the right foot. Comparing separately the initial values from the two years we notice that the initial value of the left leg in the first year is lower than the second year (5.55 sec to 6.4 sec.), while the right foot in the first year value is of

6.75 sec. to 5.9 sec. in the second year. The trend is maintained also in the final testing, the mean values being of 14.8 sec. in the second year compared to 13 sec. in the first year for the left leg, and 14.05 sec. in 2009/2010 to 14.6 in 2010/2011.

Control group - boys is characterized by developments in both tests and both legs of the results in 2010/2011, an a mean of 6.35 sec. for the left leg and 6.15 sec. for the right leg at the initial test in 2010/2011 compared to 5.6 sec. left leg and 6.05 sec. for the right in 2009/2010. At the final test the values are higher in 2010/2011 compared with 2009/2010 in both legs, which are of 7.95 sec. compared with 7.35 sec. left leg and 8.65 sec. from 7.9 sec. right foot. The difference between initial and final tests decreases in 2010/2011 with 0.15 seconds left leg than in 2009/2010, while for the right foot we notice an increase of 0.65 sec.

At girls, the experiment group has a higher evolution in 2010/2011 to 2009/2010 both at the initial values (5.75 sec. from 5.35 for the left foot and 5.65 sec to 4.50 sec for the right leg) and at the final ones (11.90 sec. compared with 11.25 sec. for the left leg and 13.4 sec. to 12.65 sec for the right leg). Instead the amplitude increases in the second year by 0.25 seconds over the first year at the left leg and drops at the right one with 0.40 sec.

At the control group girls the tendency of the experiment group is maintained, the values since 2010/2011 are superior to those of year 2009/2010, both at the initial values (6.05 sec. to 5.75 for left foot and 6, 85 sec. to 6.20 sec for the right foot) and at the final ones (7.95 sec. compared to 7 sec. for the left leg and 8.9 sec. to 8.1 sec. for the right foot). The difference between the means increases in 2010/2011 to 2009/2010 in both legs, for the left leg with an increase of 0.65 sec and for the right of 0.15 sec.

Although the values are clustered around the average, for all tests in both years tested, the degree of homogeneity of the groups is average - at the final testing of the 2010/2011 in boys, experiment group, both for the left leg and right, and at the final testing of the experimental group girls for the leg in both years tested, and is poor, both for the boys and girls from the rest of the tests made.

Conclusions

From the study we conclude that, if we include in every physical education lesson means specific to sports games (handball, basketball, volleyball, football) then we can make a balance improvement, providing a level of development corresponding to the current requests and objectives, even if the subjects are of adult age.

Sports games have an important role in improving various analyzers, this having an important role on improving motor skill - balance.

One of the important aspects in the favorable development of balance is also the maintenance of correct body attitude during the execution of different types of exercises.

Comparing the two years of experiment we can say that the evolution of groups subject to experiment is comparable, in most cases the obtained averages and the amplitude have a superior evolution in the second experiment, but there are cases when the means and amplitude values decrease in 2010/1011 opposed to 2009/2010, these cases being rare.

The complexity of motor actions specific to sports can be a continuous increase of the balance and coordination values, being a pleasant way of education, even in adulthood.

Compared with traditional methods of balance development, sports games specific methods are of an at least equal importance to them in improving the balance. Also, one can say that there is a link between motor skill improvement - balance and an increased level of general education by means specific to sports games.

Lack of material equipment does not affect the balance improvement, only balls and of course a sport field being needed, without the need for expensive equipment purchases that universities and schools cannot afford.

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

❖ MANAGEMENT IN SPORT

SPECIFIC MANAGEMENT IN SPORTS PERFORMANCE CLUBS IN ROMANIA

LARION ALIN[1], GEVAT NEJDET ISMET[2], GEVAT ISMET MONICA-DENISE[3], ALEXE DAN IULIAN[4]

Abstract

Purpose: The hereby paper represents a vocational and theoretical study, being an attempt to implement high quality management within the structures of performance sports clubs in Romania, from the perspective of a scientific managing that can efficiently lead sports in Romania, as a E.U. member, in order to achieve high results. From the theoretical point of view, the paper promotes the high managerial strategy or challenges the modern management which links the virtues of the qualitative organizing methods of the cultural and sportive activity. From the point of the sportive structures we try to elaborate a managerial project which can lead to efficient and effective development of the activity of the performance sports clubs in Romania, based of the high experience in the district of Constanta.

Methods: direct observation, method of data analysis and theoretical generalization literature, SWOT analysis, correlation method between different organizational structures from another country and from economical or social domain through comparative management.

Results: According to the variables shown in the investigation field, when the observing methods validated our expectations, we passed from their analyses to their linking. The two of these merged in the method of analyses – diagnoses SWOT – directed both towards the activity of the functional managers (managers, directors) and towards the operational managers (technical directors or coaches involved in the training process). The investigation was based on the analyses of the answers of questionnaires, on the internal documentation of the clubs regarding the real situation of the material, financial and human resources, the organization programs of the sports clubs (where they existed). The SWOT analysis unearthed strong points that can be implemented that can be logistic support in the current organization of specific structures in sport from Romania, develop a network linking the different approaches to issues facing sports clubs in the current economic and social situation, especially based of E.U. effort in the crisis period

Conclusions: The research was conducted in the domain of structural and procedural organization and focused especially on the sportive organizations from the county of Constanta. The scientific investigations made in this paper had as main aim the promoting of high quality management within the performance sportive clubs marked by the social and economic characteristics of the transition period of our country. Certainly, these investigations were centered on several independent variables presented in the work hypotheses which were partially confirmed because a lot of activity sectors (including performance sport) are determined or closely related to the social-economic factor.

Key words: economical crisis, management, sport, sport clubs.

Introduction

Sports organizations are not simply a product of a particular technology, they are designed and run by people who share different values, with different experiences and perceptions (A. Hotz, 1994). To some extent, reflect the personality of the organizations they lead and they formed(P. Kotler, 1986). Each organization is, in a sense, an evolving social experiment and adapt their responses to environmental changes (C. Gevat, A. Larion, 2004).

Sports management, is a distinct branch of sports science, because it meets the basic requirement, which is to have its own research field, use scientific methods to investigate its purpose and reach "general theoretical truths" explaining deeper investigated and issued sentences reality which helps practice (A. Larion, 2002, 2003). Sport is now the source of a source of "economic profit" to be well managed and that people enjoy sports through contracts clear, honest and consensual, led by experts "in the economic managers" so "sport deal directly with the economic (G. Johns, 1998). Structural organization consists of grouping functions, tasks, powers and duties according to specific criteria and their distribution in organizational subdivisions in order to achieve them, the groups and individuals, in order to ensure the best possible conditions to meet and exceed organizational objectives (O. Nicolescu, I. Verboncu, 1996).

Structure and style sports organizations are the product of a complex mixture of technology, culture, sports, environment and personal leadership styles.

Methods

The scientifically methods used in the current research was be: direct observation, method of data analysis and theoretical generalization literature, SWOT analysis, correlation method between different organizational structures from another country and from economical or social domain through comparative management.

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Results

The aim of the research can be divided into the following research objectives:

-First doing a survey about the real state of developing the managerial activity within the performance sports clubs by analyzing the organizational structures, work division and coordination, existing jobs, the management style etc.

-Identifying the relevant information for approaching change, agents (managers) involved in the change, the causes of change resistance, as well as the solutions of optimizing the entire activity within the clubs;

-The elaboration and putting into practice a managerial project which can lead to forming a new organizational pattern, as well as of a new organizational culture. Thus, further targets of the program are:

-anticipation, explanation and delimitation of the organizational pattern (J.P. Kotter1982);

-identifying the best degree of specializing and standardizing work assignments;

-fighting and preventing errors;

-passing from a centralized level in the management of clubs and sportive associations at a level of self-administration and high management;

-to be easy to put into practice and programmed at all levels and managerial domains in order to form a unitary concept of administrative thinking and acting in the district of Constanta and all over the country.

The research was conducted in the structural and procedural organization and specifically targeted sports organizations in Constanta.

Scientific investigations carried out in this paper were generally aim to promote efficient management of the clubs performance in terms of social phenomena - stormy economic characteristics of the transition period through which our country. Of course, these investigations were focused on several independent variables discussed the assumptions that were partially confirmed because many sectors (including professional sports) are determined or closely linked to socio-economic factors.

Processual analysis of sports organizations (R. Ray, 1994) captured in our research makes direct reference manager functions, powers, duties and managerial activities. Set of questions in the questionnaire and study interior regulations developed in accordance with the legal provisions in 2011, based on the following:

-governing bodies of sports clubs are: director, deputy director, the teachers, the Board of Directors, chairs.

-clubs, governing bodies of sport performance are: Honorary President, Director general meeting.

In the documents mentioned above we found the main duties and powers of the Director of the school sports club and executive director of the sports club, structured in managerial dimension.

Regarding design:

-curriculum design, development and club according to local curriculum development and taking into account national curriculum (CSS LPS);

-develop strategies to achieve the performance objectives established jointly by sport specialists (CS "Farul");

-draft budget and draft procurement of sports and school unity;

-extra-identifying sources of funding;

-documentation for school investments and repairs (background notes);

-draft development-specific resources of the club;

-inform all interested groups and organizations / beneficiaries about club activities.

In terms of organization:

-procurement official curriculum documents (textbooks, teaching materials library books on LPS-CSS) sporting equipment required minimal training (at CSS No.1, CSS Medgidia, CS Farul).

-received budget allocation of budgetary chapters, present budgetary situation of these clubs:

-purchase extra funds and their distribution according to priority club;

inventory-distribution means and inventory objects, updating the club's annual inventory in accordance with the laws, implementation procedures and chairs vacant vacancy in accordance with law;

-collaboration with local authorities, City Hall, regarding the allocation and use of funds for operation, maintenance and repair of school sports club, from the analysis of budget documents, we found the lack of a national grid for sports clubs stating the amounts allocated local councils according to the results obtained;

-contracts with operators in Constanta, NGOs, the mutual provision of services;

Further, in the 14 questions that determine the profile of the questionnaire, we find that defining the following dimensions:

- Possess specific skills and knowledge: professional experience, skill, creative intellectual skills, give evidence of work responsibilities and appropriate behavior towards sports club;

- Have authority;

- Have pedagogical skills (knowledge of psychology and team members, understanding, desire to achieve more than in the previous stage, honesty, justice, respect for athletes, stimulating understanding, trust, tact etc.)

- Training the driver to rely on double specialization: specific studies and economics: • club managers studied one specialization: teacher physical education by graduating from the Faculty of Physical Education and Sport, have studies and graduate, but graduate education management courses short term (2-6 months) exception is Club President "Stiinta" Constanta

who has a Ph.D. in physical education and sport;

-Professional experience from specific activity at least 5 years performance in the same club;

-Ability to lead activity manifests in how they carry out management functions:

-Functional manager of sport organizations surveyed expected quality work of coaches in 2 ways (C. Gevat, A. Larion, 2004):

-Solid and reliable distinction between coaches who benefits program at or above expectations and those whose work is satisfactory;

-Develop evaluation systems that work with coaches to see shortcomings in their work;

In the course of the first part of the research, in 2011-2012, we diagnosed and analyzed in sporting structures representative of Constanta, imposed stringent elaboration of a draft program for the development of sports clubs performance project that we wanted to be applied at Constanta club managers, being found applicability to the acceptance in whole or in part by functional managers in the period 2012-2014. In drafting the institutional development should consider limiting factors of sports performance to be solved by applying a performance management: lack of financial resources, sponsors (and political motivation for the sponsorship), lack of sports oriented process elements talented reduced motor activity levels of children and youth groups.

Organizational change management is complex because it involves first understanding the purpose of the organization, then the structure, procedures and systems, and thirdly what can be described as "dynamic" organization, means relations between people and between groups, relationship coach - sport - leadership. The choice of a theme is subjected to the Romanian social economic reality, which is in full process of development, process which triggered off similar phenomena in all domains of activity, including performance sports.

Considering that the theme of this paper can be taken a step forward, bringing permanent improvement, the reasons invoked, such as the scientific research we conducted can act as a subsidy for the purpose of this paper. Having a real base, our investigations are directed towards: labeling all relevant information for approaching the necessary changes within the sportive structures to elaborate a managerial project which can lead to efficient and effective development of the activity of the performance sports clubs in the district of Constanta.

In the same time, we had in view to take advantage of the human resources, financial and material, which can lead to the improvement of the strategy in sports clubs.

In the sportive club Farul Constanta commencement, conduct and conclusion of training are led by coach. It has the mission to "manage" sequence means used, density and intensities work done, making observations and corrections in reaction and participation of athletes. Under pedagogical tact, skill and experience of his work adapting means and intensities, depending on the reaction athletes practiced effort. If we find difficulty in making the effort, unable for various reasons (fatigue, poor recovery after an accident or illness, insufficient recovery after competition), operating changes required by the athlete reactions to requests.

At the same time, works with all means pedagogical, psychological, material and financial to motivate athletes to engage fully in meeting the quantitative and qualitative aspects of training provisions.

Motivation is a process that begins with awareness athletes on training and performance objectives, intermediate results and aims of the business in terms of results to be achieved titles, sports prestige and moral and material rewards that will benefit athletes for achieving the objectives.

Processual analysis of sports organizations captured in our research makes direct reference manager functions, powers, duties and managerial activities. Set of questions in the questionnaire and studying the rules of procedure prepared in accordance with the laws in 2012, based on the following:

-governing bodies of sports clubs are: director, deputy director, the teachers, the Board of Directors, chairs.

-clubs, governing bodies of sport performance are: Honorary President, Director general meeting. The documents mentioned above I found the main duties and powers of the Director of the school sports club and executive director of the sports club, structured managerial dimension.

At Sports High School Constanta (L.P.S.) route collaboration is longer because of performance issues are intertwined with aspects of school (teaching) from Professor - sports, sports - teacher - Manager, sport - Coach - general education teachers - manager.

Collaboration is permanently maintained by involving teachers without restraint order affective, volitional, skills in all actions required by the social order.

The other sports organizations studied (School Sports Club no. 1 Constanța, Medgidia School Sports Club) is found weekly meeting (on Tuesday), but the main feature that collaboration between managers - Board members do not always found on the best position, being less common. Club Sport Science University Constanta, given the small number of sports sections (2), collaboration is not supported by weekly meetings, it can be found as “urgently” and at annual reviews. Sports Club "Farul" Constanta, draw the conclusion that these collaborations are included in the weekly meetings held every Monday and extraordinary, organized whenever necessary.

Note that the clubs performance with increased diversification polling area sports clubs managers allow specialists to work performance and the initiatives and innovations through open

discussions, whenever it can be organized outside the framework of meetings.

-Information circulating on the chain of command, while feedback is materialized in setting future goals:
studied in clubs, the main feature linked to the circulation of information is found in full, with the best example to CS "Farul" Constanta, where most daring meet performance objectives at section level, discipline, team coaches / coach, so the information is transmitted on the basis of competences: individual, collective, employees are encouraged, according to the information received, organize their decisions and feedback gains individual character based on systematic and honest communication with the manager, the objective nature of information transmission in the foreground, excluding routine, improvisation, dogmatism, promoting new technologies rigors of training (H. Mintzberg, 1973).

• training and development

-Provides information and creates the potential service teacher education degree subordinated supporting staff participation in training modules;

Department-organized teams and school teams to ensure development through institutional projects local, national, international;

-Director coordinates, evaluates, controls and is responsible for the overall activity of the club, to the Council staff, board of directors and upper school authorities, executive director responsible for the overall activity of the club to the general assembly and superior sports authorities (DJST, ANST)

• negotiation / conflict resolution;

Crisis-prevention through effective communication;

-Resolving conflicts between departments, parent-teacher, student-teacher; reduce conflict situations between teacher (coach) - student and teacher - pupil;

-From procedural analysis that we have undertaken on the basis of questionnaires showed that the clubs were not reported major conflicts, only isolated cases resolved without criminal factor involved.

-Negotiate the most advantageous sponsorship contracts.

Offer sports organization and its performance is based on performance indicators established by the draft proposed by the school curriculum in the evaluation form and self assessment.

Conclusions

The research was conducted in the domain of structural and procedural organization and focused especially on the sportive organizations from the district of Constanta.

The scientific investigations made in this paper had as main aim the promoting of high quality management within the performance sportive clubs marked by the social and economic characteristics of the transition period of our country. Certainly, these investigations were centered on several independent variables presented in the work hypotheses which were partially confirmed because a lot of activity sectors (including performance sport) are determined or closely related to the social-economic factor.

Rethinking and procedurally and structurally reorganizing the club by the clear identification of the aim and objectives by means of which we can delimit positions, domains, jobs, activities and assignments.

The proposals presented hint both at the short term strategy and at the long term strategy in the implementation of the high quality management within the performance sports clubs in Romania.

As a result of the analyses conducted at the studied sportive structures, the financial accountancy domain has to be linked to the proposed targets; the sponsorship being on a high position in the organizational culture of the sportive club;

- attracting parents and creating a familiar direction for their involvement in the activity of the club as financing partners by taxes, subscriptions etc.;

- organizing at a national level some perfecting courses for sports and educational management, according to which the entire staff should be assessed at central level in the organizational structure of the performance and high performance sport;

- the preoccupation at institutional structural level of creating manager positions in sport (by transforming the vacant ones, by redistribution, by change, by restructuring etc.);

3. We consider that we should attract students from different specialties of the same faculty in order to find at the level of the city talents for performance sport by strategic partnerships with the institution of profile.

4. The management of changing performance sports clubs can choose between following the old well-known path of low specialized competencies, which seems easier to realize by the managerial agents, and continuously modernizing the initial forming offer and eventually, developing a new strategy regarding the management domains, as well as the activity done within the sportive structure.

SWOT analysis performed diagnostic plan structure change by improving representative with regard to teamwork, experimental findings relate to the following:

- The coach is very little known sport of Constance, and therefore not implemented, developing strategy for participation in the contest, recovery capacity of the athlete performance and very little motivating athletes in clubs studied contains only the coach's work; this strategy change, referring to the coach training is elastic in nature and at the same time dynamic, which allows to adapt any specialist requirements for rapid integration with differentiated skills required by the labor market.

- The management team are born informal groups (in individual sports (gymnastics) and more prominent in sports games), consisting of experts forming an alliance which is to avoid failures and consolidate outstanding sports results. Likewise, as a conclusion leading underline the existence of strategic alliances between clubs, the profiles and different levels (school sports club with senior sports club, sports section of the ward school sports club / senior-level sports industry, ie double legitimation).

Functional core structure of the training and development of athletes is a relatively independent dimension, surrounded and thus influence the external part of a series of objective factors (space-time-habitus psychosocial) and subjective (teaching style method teacher), on the other hand, inside the psychosocial climate (or both) that installs between the two agents of instruction (teacher-student, coach-athlete, team, team work and so on).

Psychosocial habitus was recovered in the organizations studied by affective-motivational processes employing order on the one hand a series of teacher personality traits: the capacity for empathy, innovation, creation, analysis, passion and so on, and on the other some characteristics of the student (athlete): motivation, interest, desire, aspiration, perseverance, etc. available

The analysis of procedural, performance management principles were found in methods to highlight the clubs strategy studied (A. Larion, 2005,2007):

-moral integrity (honesty, respect his word and commitments analysis presented in meetings and others);

-transparency in any action based on fundamental accounting rules, shareholders' rights and to specify sponsors, encouraging other investors affiliation contracts athletes become active within the club (in the present context, only C. S .Farul Constanta);

-sustainability-any action to have long-term sustainability of all activities.

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

CONSTRUCTION OF A SCALE FOR GOVERNANCE ADMINISTRATION OF SPORT FOR ALL IN SPORT CLUBS IN EGYPT

YAHIA MOHAMED EL-GEIOUSHY ABDEL KHALEK[1]

Abstract

The research aims to establishment a scale for arbitration administration of sport for all at sport clubs in Arab Republic of Egypt and the chosen research sample included deliberately individuals of workers in the field of sport form all divided as the follows: 28 of executive managers at sport clubs, (Basyouni M. Mostafa, 2009) of national projects' managers at national council of sport, (M. Curtis J. P. Katharina, 2010) of leaders at Egyptian union of sport for all, (El-Torgoman M. Sameh, 2006) of sport for all managers at sport clubs, (D. Lesley, 2011) of sport for all responsible in the clubs. And the use of the researcher a standard for arbitration administration of sport for all, the researcher prepared (2012). And the most important results that the a scale includes four dimensions that are: disclosure and transparency, members' rights, responsibilities of board of directors, and role of stakeholders.

Keywords: governance – sport for all.

Introduction and Problem of Research

Organization of Economical Cooperation & Development "OECD" (2012) refers to that the concept of Governance a part of universal culture seeks to promote the participation of different social parties with the government in making and execution of general policies, to express the reaction between the country and the civil society and the private sector to achieve the continuous development (Oced.2012).

United Nations of Developmental Program "UNDP" (2006) confirms the necessary requirements for good governance, which includes the following factors: respecting the law and its supremacy and achieving of justice and equity, transparency, responsibility toward all parties, and conformity concerning serving the public interest, efficacy and the optimal use for resources and abilities and accountability of all parties (government – private sector, civil society) and each of them, and ability to deal with crisis, and direction toward efficacy in presenting services, and legitimacy and acceptance at people, and enabling the stakeholders, and tolerance and accepting the objectionable points of views, in addition to empowerment communication mechanisms of different stakeholders categories and participation and finally ability to pack the resources (Samiha, 2006).

The directory of rules & standards of companies governance in Arab Republic of Egypt (2006) recommends revision and modification the principles of the governance an included the following principles: putting bases for effective system for institution's governance, shareholders' rights, transparency, responsibility of board of directors, fair dealing with the shareholders, and the role of stakeholders. (Ashraf, 2006).

The problem of the research emerges from weakness of public awareness of the importance of sport clubs' governance meeting cases of administrative and financial shortage from which most of sport for all programs and activities suffer, that are applied all over the republic in these clubs, in addition to and limitation of the legislative, legal and regulatory framework that regulates the works of these activities and programs in establishment of general principles of governance, as the projects of sport for all in many of sport clubs in Egypt suffer from many of manipulation, exploitation, financial and administrative corruption phenomena and trial to exploit the members in election works, mostly such as these phenomena to loss of administration's fame, desire in sharing and wasting the investment chances in the projects of sport for all that is reflected in rights of members in providing the sport practicing chances, rather than wasting the financial resources in these clubs exposing them to accumulation of debts and bankruptcy.

So, it became necessary to search for the most successful means in treatment such as these phenomena, an putting projects of sport for all in the sport clubs on the way of correct businesses and good administration, and the system of institutions' governance is considered one of control and direction to limit the phenomena of administrative, financial and legal shortage, and the sport clubs became most in need to a system for its governance and after its adapting in the way that is suitable for their business's conditions and requirements, so this was a reason for the research to direct toward establishment of a standard for governance of sport for all administration in the sport clubs with what is suitable for the requirements of the business of these sport clubs.

Reviewing the reference framework that highlights the rarity of researches that are interested in studying the governance system in the sport field and in the sport institutions in Egypt and Arab World, and lacking of Egyptian & Arabian environment to a scale that measures the governance of administration of sport for all in the sport clubs itself is considered a problem.

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Received 7.5.2012 / Accepted 3.08.2012

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

Pushing the researcher to carry on this research to recognize how to apply the institutional governance principles of sport for all administration in Arab Republic of Egypt.

Materials and Methods:

1- **Basic Research Sample**: That is chosen deliberately reached (85) individuals of workers in the field of sport form all divided as the follows: (28) of executive managers at sport clubs, (6) of national projects' managers at national council of sport, (10) of leaders at Egyptian union of sport for all, (15) of sport for all managers at sport clubs, (26) of sport for all responsible in the clubs.. Also the exploratory sample included (20) individuals from the non basic research sample.

2- **The scientific treatments:** they were performed in the period from 5/9/2011 to 3/10/2011 upon sample reached (20) individuals of the workers in the field of sport for all from the non basic research sample.

3- **Arbitrators' believe:** The standard is shown to (10) experts in the field of general administration, sport administration and sport recreation, agreement factor between arbitrators reached (100%) on the dimensions and clauses of the standard.

4- **Internal Uniformity Believe:** It ranged between (0.801) and (0.924) at 0.01 significance indicating that the standard is characterized with high degree of believe.

5- **Standard Stability:** Stability factor ranges using method of half division by alpha cronback factor 0.909-0.867.

6- **Main Study:** The researcher applied the standard on the research's sample after assuring the believe and stability in the period from 20/12/2011 to 30/1/2012.

Results & Discussion

Table (1) First Dimension: Disclosure & Transparency N=85

No.	Clause	M	S.D	Completely Agree		Agree		Hesitated		Objection		Completely Objection		Total	%	Order
				R	%	R	%	R	%	R	%	R	%			
1	Announcement all information of sport institutions (objectives & activities, expenses & revenues)	3.63	0.785	65	76.47	14	16.47	1	1.18	5	5.88	-	-	308	90.59	1
2	Declared information in the sport institution helps in investmental decision making	3.61	0.725	63	74.12	12	14.12	9	10.59	1	1.18	-	-	307	90.29	2
3	Financial & non-financial reports are characterized by transparency according to declared rules & known at fixed	2.22	1.12	55	64.71	13	15.29	9	10.59	7	8.24	1	1.18	284	83.53	4

	times															
4	Declaring of rules and measures that control censing the sport institution	3.40	1.11	60	70.59	10	11.76	9	10.59	1	1.18	5	5.88	289	85	3
5	Declaring all measures concerned with rewards and wages of all workers and rewards of board of directors if present	3.29	1.28	60	70.59	8	9.41	6	7.06	4	4.71	7	8.24	280	82.35	6
6	There is a committee for internal audition for recreational institution to revise all measures that are done by different branch administrations	3.31	1.23	59	69.41	11	12.9	4	4.71	5	5.88	6	7.06	282	82.94	5
7	There is a separate committee for internal audition to assure that the institution applies the universal accounting standards to warrant effective application and censing works' judgment	2.89	1.51	49	57.65	9	10.59	8	9.41	7	8.24	12	14.12	246	72.35	10
8	The institution declares any punishment imposed on it in different mass media	3.23	1.15	53	62.35	10	11.76	15	17.65	3	3.53	7	8.24	275	80.88	7
9	A list of main investment risks that the sport institution may expose to is posed	3.49	1.00	62	72.94	11	12.9	8	9.41	-	-	4	4.71	297	67.35	11

	in transparency to the investors															
10	Announcement of units & categories of sport institution	3.12	1.27	52	61.18	10	11.76	10	11.76	8	9.41	5	5.88	266	78.2	8
11	Announcement financial status and its development for the sport institution	3.02	1.39	51	60	9	10.59	9	10.59	8	9.41	8	9.41	257	75.59	9

Table (2) Second Dimension: Members' Rights N=85

No.	Clause	**M**	**S.D**	Completely Agree		Agree		Hesitated		Objection		Completely Objection		Total	%	Order
				R	%	R	%	R	%	R	%	R	%			
1	Internal regulation of the institution includes all necessary measures to warrant practicing of the working members their rights	**3.21**	**1.18**	**59**	**69.41**	**7**	**8.24**	**7**	**8.24**	**5**	**5**	**7**	**8.24**	**276**	**81.18**	**5**
2	Obtaining the related information to the sport institution in time.	**3.08**	**1.41**	**53**	**62.35**	**10**	**11.76**	**9**	**10.59**	**2**	**2**	**11**	**12.9**	**262**	**77.06**	**8**
3	Declaring the appointment of general meeting holding for members and its timetable	**3.41**	**1.13**	**62**	**72.94**	**9**	**10.59**	**5**	**5.88**	**4**	**4**	**5**	**5.88**	**289**	**85**	**2**
4	General meeting's member has the right to participate and vote in the general meeting	**3.45**	**1.08**	**63**	**74.12**	**9**	**10.59**	**6**	**7.06**	**3**	**3**	**4**	**4.71**	**294**	**86.47**	**1**

5	The members of the institution have the right to discuss the listed subjects in the timetable	**3.59**	**0.781**	**55**	**64.71**	**11**	**12.9**	**3**	**3.53**	**8**	**8**	**8**	**9.41**	**267**	**78.53**	**7**
6	The members of board of directors reply all inquiries of sport institution's members	**3.35**	**1.21**	**61**	**71.76**	**8**	**9.41**	**7**	**8.24**	**3**	**3**	**6**	**7.06**	**285**	**83.82**	**3**
7	The working member has the right to elect or vote of confidence for the head or the members of board of directors	**3.29**	**1.28**	**60**	**70.59**	**8**	**9.41**	**6**	**7.06**	**4**	**4**	**7**	**8.24**	**280**	**82.35**	**4**
8	All members are treated equally where rights, duties and information	**2.94**	**1.43**	**47**	**55.29**	**13**	**15.29**	**8**	**9.41**	**7**	**7**	**10**	**11.76**	**250**	**73.53**	**11**
9	There is a protection for the members from abusing that owners of ruling percentages may perform	**3.24**	**1.25**	**57**	**67.06**	**9**	**10.59**	**7**	**8.24**	**7**	**7**	**5**	**5.88**	**276**	**81.18**	**5**
10	Any member can't exceed 10% of net value of institution assets	**2.96**	**1.50**	**51**	**60**	**10**	**11.76**	**7**	**8.24**	**4**	**4**	**13**	**15.29**	**252**	**74.12**	**10**
11	It's available for all members to obtain enough compensation in case of breaching their rights and taking legal measures against board of directors	**2.94**	**1.48**	**49**	**57.65**	**11**	**12.9**	**8**	**9.41**	**5**	**5**	**12**	**14.12**	**250**	**73.53**	**11**
12	The member participates in and be familiar with decisions concerning the main changes in the institution	**3.01**	**1.24**	**45**	**52.94**	**14**	**16.47**	**11**	**12.94**	**12**	**12**	**3**	**3.53**	**256**	**75.29**	**9**

Table (3) Third Dimension: Responsibilities pg Board of Directors N=85

No.	Clause	M	S.D	Completely Agree		Agree		Hesitated		Objection		Completely Objection		Total	%	Order
				R	%	R	%	R	%	R	%	R	%			
1	Council of board of directors performs the strategic planning of the institution achieving its interests.	**3.52**	**0.786**	**62**	**72.94**	**12**	**14.12**	**5**	**5.88**	**6**	**7.06**	**-**	**-**	**300**	**88.24**	**1**
2	Board of directors warrants the integrity of accounts & financial lists preparation lists of the institution	**3.31**	**1.19**	**59**	**69.41**	**9**	**10.59**	**6**	**7.06**	**7**	**8.24**	**4**	**4.71**	**282**	**82.94**	**3**
3	The member, doesn't occupy the membership of board of directors for more than four continuous years	**2.83**	**1.43**	**44**	**51.76**	**12**	**14.12**	**8**	**9.41**	**13**	**15.29**	**8**	**9.41**	**241**	**70.88**	**11**
4	the executive manager of sport institution is characterized by experiences and efficacy	**3.21**	**1.18**	**59**	**69.41**	**7**	**8.24**	**7**	**8.24**	**5**	**5.88**	**7**	**8.24**	**276**	**81.18**	**4**
5	All members of board of directors are characterized by good reputation and integrity	**3.34**	**1.21**	**60**	**70.59**	**10**	**11.76**	**4**	**4.71**	**6**	**7.06**	**5**	**5.88**	**284**	**83.53**	**2**
6	There are independent persons (one at least) in board of directors by	**3.20**	**1.32**	**57**	**67.06**	**8**	**9.41**	**7**	**8.24**	**6**	**7.06**	**7**	**8.24**	**272**	**80**	**5**

	employment clerks of high experiences															
7	Elections are done to choose the members of board of directors by integrity and complete transparency	**2.78**	**1.52**	**45**	**52.94**	**11**	**12.9**	**7**	**8.24**	**13**	**15.29**	**9**	**10.59**	**240**	**70.59**	**12**
8	The institution obligates the employees by complete availability for working at institution	**2.84**	**1.46**	**46**	**54.12**	**10**	**11.76**	**8**	**9.41**	**12**	**14.12**	**9**	**10.59**	**242**	**71.18**	**10**
9	The executive manager will provide who want to invest in the institution, by the information upon request with no charge	**3.05**	**1.41**	**53**	**62.35**	**9**	**10.59**	**7**	**8.24**	**7**	**8.24**	**9**	**10.59**	**260**	**76.47**	**6**
10	Members of board of directors perform the effective follow up for executive administration of the institution	**2.95**	**1.38**	**48**	**56.47**	**10**	**11.76**	**8**	**9.41**	**13**	**15.29**	**6**	**7.06**	**251**	**73.82**	**8**
11	Board of directors prepare measurement policies for different administrations governance and supervision on its application	**2.92**	**1.46**	**49**	**57.65**	**9**	**10.59**	**9**	**10.59**	**8**	**9.41**	**10**	**11.76**	**249**	**73.24**	**9**
12	The administration allows some of its workers by working for some times	**3.00**	**1.43**	**51**	**60**	**9**	**10.59**	**8**	**9.41**	**8**	**9.41**	**9**	**10.59**	**255**	**75.00**	**7**

13	Accurate & tight censing system is applied on the board's members	**2.77**	**1.40**	**40**	**47.06**	**14**	**16.47**	**11**	**12.9**	**12**	**14.12**	**8**	**9.41**	**236**	**69.41**	**13**

Table (4) Forth Dimension: Role of Stakeholders N=85

No.	Clause	**M**	**S.D**	Completely Agree		Agree		Hesitated		Objection		Completely Objection		Total	%	Order
				R	%	R	%	R	%	R	%	R	%			
1	The institution respects the resulting rights of stakeholders according to the law and also the mutual agreements between the institution administration and stakeholders	3.43	1.02	60	70.59	11	12.9	7	8.24	5	5.88	2	2.35	292	85.88	2
2	The stakeholders obtain all reliable information to do their responsibilities toward the institution	3.49	0.933	61	71.7	11	12.9	8	9.41	4	4.71	1	1.18	297	87.35	1
3	The stakeholder are compensated completely for any breach to their rights	3.34	1.13	58	68.24	10	11.76	9	10.59	4	4.71	4	4.71	284	83.53	3
4	Complaints and disputes are settled that arise between the institution and	3.31	1.11	56	65.88	11	12.9	10	11.76	5	5.88	3	3.53	282	82.94	4

	the stakeholders objectively															
5	Information related to the suppliers and customers are kept confidentially	3.29	1.10	54	62.53	13	15.29	9	10.59	7	8.24	2	2.35	280	82.35	5
6	There are mechanisms that reinforce the performance and participation of workers to invest their special skills	3.24	1.13	50	58.82	11	12.9	13	15.29	5	5.88	6	7.06	264	77.65	7
7	It should be to confess completely by the rights of stakeholders as the law states	3.17	1.18	51	60	12	14.12	13	15.29	5	5.88	4	4.71	271	79.71	6

1- First Dimension: Disclosure & Transparency:
It's shown from table (8) that the responses of research sample range from (80.59%) and (67.35%) and the responses more than (80%) are arranged as the follows:

1- Declaration of all recreational institution's information (objectives and activities, expenses and revenues) (90.59%).
2- Declared information in the recreation institution helps in investmental decision making (90.29%).
3- Disclosing the rules and measures that rule the censorship processes on the recreational institute (85%).
4- The financial and non financial reports are characterized by transparency and are issued according to declared and known rules at fixed times (83.53%).
5- There is a committee for internal audition of recreational institution to audit all measures that are performed by different branch administrations (82.94%).
6- The institution declares any punishment or imposed penalty in the different media environments (80.88%).

The researcher belongs this to perceiving and convincement of the research sample of the importance of availability of all information about the recreational institutes sharing in supporting the process of decision making, also the financial and non financial reports should be characterized by transparency and the necessity of committee of internal audition to audit all measures that are performed by different branch administrations an also declaring all policies concerning rewards and wages of different administrative levels in the institute.

This agrees with opinions of Chien (2012) Lesley (2010) Ashraf Abel Rahman (2009) Hazem Hassan (2008) and Samiha Fawzy (2004) that disclosure and transparency are considered the most important rules that form the basic foundations of the governance, also the information correcting an clarity should be right, clear an complete to all stakeholders. As the financial and non financial disclosure and information availability is the most important institutional governance policies that should be adapted by the institutions to achieve the philosophy of good administration.

2- Second Dimension: Members' Rights:
It's shown from Table (9) that the responses of research sample ranges between (86.47%) and

(73.53%) and the responses more than (80%) are arranged as the follows:

1- The member of general meeting has the right to participate and vote in the general meeting (86.47%).
2- Declaring the date of general meeting assembly for members and its business table (85%).
3- The members of board of directors answer all inquiries of members at recreational institution (83.82%).
4- The working labor has the right to elect or ask a confidence for head or members of board of directors (82.35%).
5- The internal regulation includes all necessary measures to warrant practice of working members all their rights (81.18%).
6- There is protection of the members against abusing by the ruling percentages owners (81.18%).

The researcher belongs this to perceiving of the research sample to the necessity that the institute's regulations include the measures that warrant the members to practice their rights and declaring the dates of general meeting assembly, also it's necessary that the members of board of directors answer any inquiry presented from the members at the institution as the regulation warrants the right of institute's member to as confidence of members of board of directors, also there should be protection of the members against abusing by the ruling percentages owners (owners of higher percentages of shares) and this in case of floating the institution for circulation as a future step.
This agrees with the opinions of: (Alessio) (2010) (Brian) (2011) (OECD) (2012) Osama El-Sayed (2010) Mohsen El-Khodeiry (2008) and Sameh El-Torgoman (2006) that the determination of rights of members at the institution is the most important mechanisms of governance, and necessity of warranting that the administration doesn't abuse the members to abuse their money, and the importance of the sharing members to know their rights and the necessity of protection of the administration for the members the owners of ruling percentages.

3- Third Dimension: Responsibilities of Board of Directors:

It's shown from the Table (10) that the responses of the research sample ranges between (88.24%) and (70.59%) and the responses more than (80%) are arranged as the follows:

1- Board of directors perform the strategic planning of the institution achieving their interests (88.24%).
2- Members of board of directors are characterized by good reputation and integrity (83.53%).
3- Board of directors warrant the integrity of the institution's accounts and systems of financial lists preparation (82.94%).
4- The executive manager of recreational institution is characterized by experience & efficiency (81.18%).
5- There are independent persons (one at least) in the board of directors by employment employees of high experiences (80%).

The researcher belongs this to the convince of the research sample with the important role of the members of board of directors to perform the tasks of the strategic planning of the institution, the necessity of good reputation and integrity, warranting the integrity of the accounts and the financial and non financial lists of the institution, also the executive manager should be characterized with efficiency according to the role he plays in administration and development and improvement of institution, also presence of some independent persons among the members of the board of directors by employment is favored to warrant several and various experiences inside the board of directors.
This agrees with the opinions of (Marc) (2012) (Lesley) (2011) Mostafa Basiouny (2009) Nermin Abou El-Ata (2005) and Ahmed Abdel Rahman (2003) that the board of directors is responsible for success of governance system through the strategic planning of the institution, and the board of directors should include those who have experience and efficiency, who have good reputation and integrity. The most important tasks of board of directors is strategic planning of the institution and the integrity of the financial lists, variance of administrative experiences inside the board, also the board of directors should warrant the strategic direction and guidance of the institution and every one in the board of directors and the executive administration should carry the direct and indirect responsibility for the extent of achieving the objectives of the institution, and achieving the objectives of the members, and the objectives of stakeholders.

4- Forth Dimension: Role of Stakeholders:

It's shown from Table (11) that the responses of the research sample ranges between (87.35%) and (77.65%) and the responses more than (80%) are arranged as the follows:

1- The stakeholders obtain all information upon which it's possible to depend to perform their responsibilities toward the institution (78.35%).
2- The institution respects the rights of stakeholders that emerge according to the law and also the mutual agreements between the institution administration and stakeholders (85.88%).
3- The stakeholders are compensated completely for any breach for their rights (83.53%).

4- The complaints and disputes emerging between the institution and the stakeholders are settled objectively (82.94%).
5- The information concerning the suppliers and customers are kept confidentially (82.35%).

The researcher belongs this to the perceiving of the research sample of different categories to the importance of role of stakeholders who deal with the institution and the necessity of presenting all information and means that enable them to perform their work, and the institution should respect the laws that determine the nature of dealing between the institution and the stakeholders. This agrees with the opinions of (Marc) (2012) (Curtis) (2010) Ibrahim El-Meligy (2008) Nermin Abou El-Ata (2005) Khairy El-Gezeiry (2002) about the necessity of considering the rights of stakeholders according to the common services and interests they present to the institution either directly or indirectly.

Conclusions & Recommendations:

1- Validity of The scale for use as the governance standard of sport administration in the sport clubs is characterized by high believe and stability as the standard stability treatments ranged between (0.909 – 0.867) referring to the standard validity and availability its scientific conditions.

2- The governance A scale of sport for all administration in the sport clubs is composed of (43) items distributed upon (4) branch dimensions: disclosure & transparency, members' rights, responsibilities of board of directors, role of stakeholders.

Recommendations:

1- Necessity of using governance a scale of sport for all administration in many of studies, publishing the awareness by the importance of applying the thought of governance inside the sport institutions, the importance of training the sport institutions their board of directors' members on how to perform the role committed to them to the fullest.
2- Necessity of reviewing the ruling laws and legalizations in the sport field generally and the field of sport for al particularly to block the jabs between the written rules either in the laws and between the scientific application, and awareness of the members by their rights and the importance of the role played by the accounts' auditor in protection of those rights.
3- Necessity designing electronic sites for different sport institutions is an official and real source for information about the institution policies and their future plans, administration there.

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

❖ VARIA

THE ROLE OF AQUATIC ACTIVITIES IN THE DEVELOPMENT OF PSYCHO-MOTOR SKILLS IN INFANTS

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Abstract

Purpose. The aim of this research was to experimentally prove the beneficial effects of water activities in infants.

Methods. The experiment, the test, the observation, the statistical-mathematical method, the graphical representation.

Results. The values of the experimental group were found to be higher than the ones for the control group.

Conclusions. Our hypothesis, "*The practice of physical exercise in an aquatic environment stimulates the psycho-motor development in infants"* was confirmed.

Key words: infants, psycho-motor skills, development, aquatic activities

Introduction

In the field of physical education in general, but also in the field of school physical education, we can signal the existence of several conceptual preoccupations regarding the diversification of the activity content, promoting new ways meant to enlarge the beneficial influence brought by exercise.

In the context of relative turmoils regarding the consolidation of the physical education status as an academic field, the phrase "physically educated" can be heard more and more often, and is considered to be a rightful component of the global basic education of the future members of society. They must be well educated, intellectually and physically.

Regarding the diversification of the physical education activity content, the "aquatic activities" are more and more visible, and moreover, the phrase "aquatic education" can be heard more often, this being a right step toward **considering the aquatic activity as a rightful component of physical education, and not just a training stage in teaching swimming.**

The aquatic activities are widely used in many European, North American, and other countries; they have a long history and are in a continuous development. In Romania, the clubs promoting aquatic activities as such, appeared at the beginning of the nineties, and are still very few of them.

The promoters of aquatic activities consider the action of raising a child as the most important task an adult can have, that is why raising your child "intelligently" by choosing the best options for him, is necessary in order to give the child a good start in life. The first three years in a child's life are the most important. What happens in these years, from the point of view of the child's development, has an important impact on his future life. **(FLEGEL, J., KOLOBE, T.H.A., 2002)**

Numerous scientific studies have proven the existence of a positive correlation between aquatic activity and movement synchronization; by trying to find his balance, the child experiments with his motor abilities and his creativity, as well as with the effects of risk, taking it into account as being a part of his environment. This psycho-motor development can lead to an earlier development of the motor skills.

As a premise, understanding the aquatic education as a basic condition, we must consider the infants' natural predisposition for floating. The infant's body density predisposes him to a natural horizontal flotation, while he retains, from his intrauterine life, an instinctual reflex to block his airways when immersed.

The aquatic environment, with its three spatial dimensions, offers new feelings to infants that lead them to explore various situations. This bodily and sensory "consciousness" must be encouraged.

We must also consider another characteristic of water, which is its great power of calming the infants, this being a favoring factor for the water activities.

Placing a new-born baby in an aquatic environment ensures continuity for the intrauterine development, thus accelerating the bio-psycho-somatic development through the autonomy of the movements. The children practicing simple aquatic movements can learn faster to walk on their own, in comparison with the ones that did not benefit from this psycho-motor stimulation. Immersion programs develop psycho-motor skills, especially by stimulating the perceptive activity, as an elementary experiencing process.

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Received 4.05.2012 / Accepted 4.08.2012

The great advantage of an aquatic session is a low demand on the bones, ligaments, and tendons. This advantage leads to the possibility of performing a large number of various movements that on land are not yet accessible to the child.

The 0-6 month old children rediscover in water the environment that they left a short while ago.

The existence of a direct or indirect link between the specific reflexes and the later voluntary movements still remains unknown. A few of these reflexes can be stimulated in water in 0-4 year-old children. (**GRECU, A., 2006)** The great majority of the studies have shown that the effects of early psycho-motor stimulation in infants have positive influences on their future psycho-motor development. In infants, the movement reflexes used for the motor development can be successfully stimulated in water.

The researches conducted on this subject in the U.S.A. have demonstrated a series of stimulating effects produced by these programs performed in water: they have the potential to "increase" the child's intelligence, concentration skills, attention, and perception. Its favorable effects regarding social implications, emotional, and psychological, have also been proven. Of course, the manifestations regarding the cognitive and motor development need time, patience, and repetition. This has been proven by American researchers during 12 months children programs. (**GRECU, A., 2011)**

Water is a protective and stimulating environment for infants, and this is due to the lack of gravity. Optimal learning conditions, combined with patience and attention, can have beneficial effects also on a traumatized child.

A lot of children learn to move in water before they learn to walk. While they make progress in this direction, we can witness **an improvement of the coordination ability and endurance**, and an **improvement of the respiratory system.**

The practice and precision of water exercises have also an influence on sleeping. The parents have noticed an improvement of the **child's sleep**. **The early aquatic activity increases the child's self-confidence and independence** through the free movements performed in water that are impossible to perform on land at this age. Most times the aquatic activities start at the age of 3-4 months, but they an also start in the infant's first month of life.

The development stages reflect the progress of motor skill learning, of cognitive skills, and personal development in infants. **In each stage, they manifest personal, motor, and cognitive characteristics that determine their ability to engage in aquatic activities and to learn through them.**

Motor development refers to postural, locomotor, and manipulative aspects, while cognitive development refers to the modifications regarding the knowing, being aware, and understanding the environment, the daily events, and ways of communication. The development of emotional intelligence refers to the modifications related to the emotional needs and social skills.

Thus, we must admit that the aquatic activity can have a real influence on the psycho-motor development of the child. (IONESCU, M., ANGHELESCU, C, BOCA, O, HERSENI, I., POPESCU, C., STATIVA, E., ULRICH, C, NOVAK, C., 2010)

Aim of this research

The aim of this research was to experimentally prove the beneficial effects of water activities in infants, with regards to the development of psycho-motor skills, as a prelude to the individual's entire motor activity.

Objective of this research

The main objective of this research was to verify and confirm the hypothesis.

This research is a longitudinal analytical study, conducted over a period of 8 weeks, on two groups, one experimental, and one for control, the dependent variable being the age, which implies the process of growth and development, while the independent variable was a program of aquatic activity that was administered only to the experimental group.

Premises

Psycho-motor skills are a synthesis of the mental and motor skills allowing the individual to adapt harmoniously to his/her environment.

In physical education and sports, regarding the psycho-motor skills, we have in mind a healthy individual. In this case, the high performance depends primarily on the accuracy of the sensory information, on the inferior and superior thresholds of sensitivity, on the differential thresholds, respectively, on the sensory discrimination, all of them determining the level of the perceptive skills, on which the reception characteristics, information processing, and decision making depend. **(MOULIN, J.P., 2006)**

The psycho-motor skills develop progressively, allowing the constitution of a consciousness of the body and movements, as one of the richest and most important manifestations of the human behavior. The motor behavior results from the interaction between the evolution of skeletal and muscle structures, their maturing, and exercise, training level.

In comparison with the terrestrial environment, the aquatic environment offers proper conditions for the evolution and development of the psycho-motor skills, even from birth (through the reduction of the gravitational forces).

Hypothesis

The practice of physical exercise in an aquatic environment stimulates the psycho-motor development in infants.

Organization of the research

The aquatic education program was conducted over the course of 8 weeks, with a frequency of 2

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
The journal is indexed in: Ebsco, SPORTDiscus, INDEX COPERNICUS JOURNAL MASTER LIST, DOAJ DIRECTORY OF OPEN ACCES JOURNALS, Caby, Gale Cengace Learning

sessions per week, at the aquatic activities club "EMD Tennis Academy", in Bacau.

The duration of the sessions was between 30 minutes and 50 minutes, maximum.

Material and methods

The research methods we used were: The experiment, the test, the observation, the statistical-mathematical method, the graphical representation, and the study of the specialized literature.

At the Bacau "EMD Tennis Academy", where the research was conducted, all the specialized conditions, material, and organizations, necessary for such an endeavor, were met.

The subjects were children who were enlisted in the club's aquatic activities.

For every subject, we had the parents' written consent regarding the child's participation in our experiment. We met some difficulties regarding the subjects of the control group, from the children's parents.

We tried to make the number of subjects in the experiment group to be as close as possible to the number of subjects in the control group.

A stable environment was ensured by providing the same teacher, who worked with every child in the experiment group.

Table 1 ***The subjects of the experiment***

EXPERIMENTAL GROUP			**CONTROL GROUP**		
The group of	No. of subjects	No. of subjects	The group of	No. of subjects	No. of subjects
Age	Male	Female	Age	Male	Female
1 - 6 months	2	5	**1 - 6 months**	4	3
7 - 12 months	12	3	**7 - 12 months**	2	4
13 - 18 months	8	7	**13 - 18 months**	3	5
19 - 24 months	12	3	**19 - 24 months**	4	5
25 - 30 months	8	7	**25 - 30 months**	2	2
31 - 36 months	8	7	**31 - 36 months**	2	3
Total subjects on gender	50	32	**Total subjects on gender**	17	22
Total number of subjects	82		**Total number of subjects**	39	

The subjects belonging to the experiment and control group were selected from different areas of the country. They did not have any experience regarding the practice of water activities.

The subjects from both groups did not have any health issues during pregnancy, birth, and until the moment of testing.

The tests were elaborated for measuring the following types of motor behavior:

- **Reflexes.** An innate fast and automatic reaction to a specific environment stimulus. This reaction is assessed through **8 drills** (items).
- **Non-locomotor** (stationary). This test aims to evaluate the child's ability to maintain his/her balance, to control his body by refining the kinesthesic sensations. It is composed of **20 drills**.
- **Locomotor.** This test assesses the child's ability to move, and it is composed of **65 drills.**
- **Object manipulation.** In this test, the manipulated object is a ball. Because from the point of view of development, it is impossible for an infant to organize and coordinate the manipulation of a ball, this test is aimed at children who are more than 11 months old. It contains **14 drills** and it involves activities of throwing, catching, and hitting/kicking.
- **Object grabbing.** This test evaluates the children's ability to use the muscles in their hands, and it determines, progressively, their prehensile ability, and their ability to control their fine movements (the fingers' grabbing movement). It contains **21 drills.**

Table 2 ***Age categories and tests for the experiment and control groups***

Tests	**Reflexes**	**Non-locomotor**	**Locomotor**	**Manipulation**	**Grabbing**

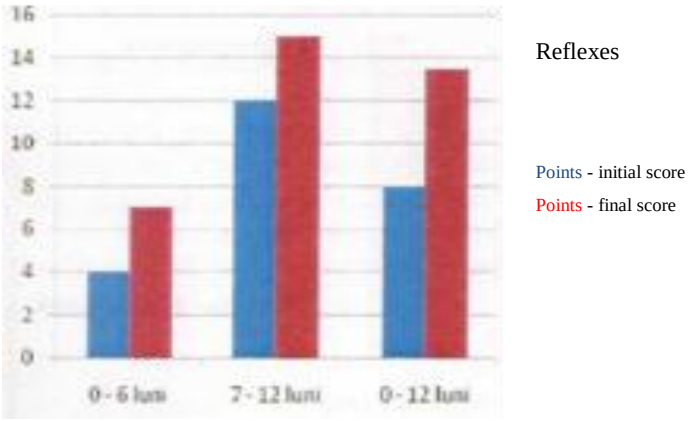
y.o.	**1**	**1**	**1-3**	**2-3**	**1**
Categories (age in months)	0-6	0-6	0-6	-	0-6
	7-12	7-12	7-12	-	7-12
	-	-	13-18	13 - 18	-
	-	-	19-24	19-24	-
	-	-	15-30	25-30	-
	-	-	31 -36	31 -36	-

Results

The reflex test, for the categories: 0-6 months, 7-12 months, and grouped for the 0-12 months category.

The reflexes, as global manifestations, or spontaneous motor responses, represent a biological normality, and they gradually disappear with the maturing of the cortex and of the inhibition and facilitation mechanisms. The reflexes grow weaker and disappear before the appearance of organized skills.

The innate reflexes have a different evolution, some disappear, while others perfect themselves, and diversify (in compliance with the law of development, from global to specific); we must take into account these aspects especially when interpreting the results.



The non-locomotor test

Regarding the progress of the statistical indices for the six age groups, we can emphasize several relevant aspects.

For the point values and the month equivalent, the average values indicate a positive progress concerning the psycho-motor skills, in all age categories, a process that is not accompanied, nevertheless, also by distribution grouping, in all age categories.

Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
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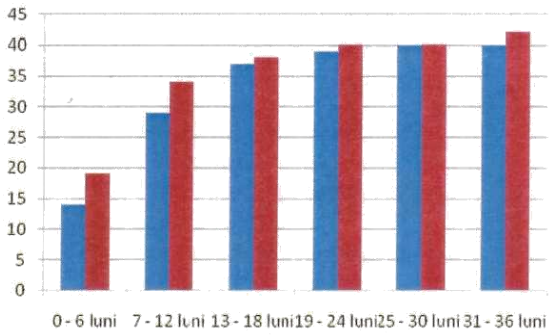


Non-locomotor

Points - initial score

Points - final score

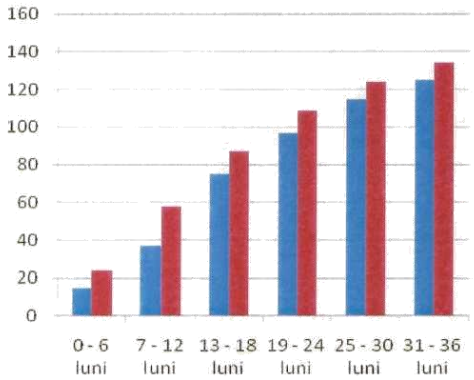
In all of the age categories, the values recorded before and after the testing, are increasing, and, except for the 25-30 months old category, they are superior for all age groups. The highest progress was recorded for the categories: 0-6 months, 7-12 months, and 31-36 months.

Regarding the month evaluation, the values stagnate for the 25-30 months old category, and the psycho-motor age has an ascending progress, the highest values being recorded in the 19-24 and 31-36 months old age category.

The distributions of the observations are based on the absolute values the subjects recorded in each test.

The locomotor test, for all age categories.

None of the distributions can be considered normal, because of the skewness of the observations in relation to the average, and because the quota of ½ of the total observations was exceeded. The statistical values show a positive progress. The average values increase from the initial tests to the final tests, with a slight improvement, for the values, points and months.



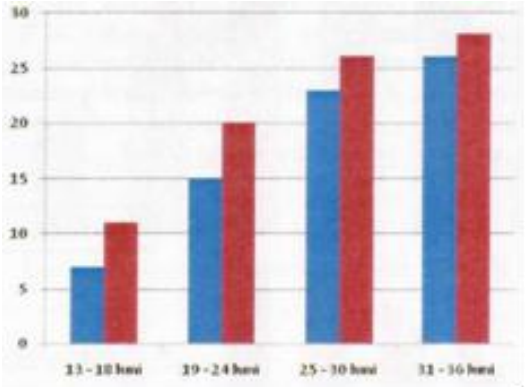
Locomotor

Points - initial score

Points - final score

The object manipulation test, for the 2-3 years old categories.

The abnormality of the distributions is obvious in all measurements, before and after the test. The average values increase slightly after the test, accompanied by a moderate amplification of the group.



Object Manipulation

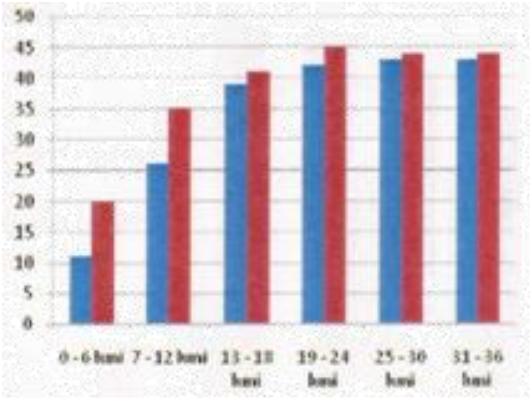
Points - initial score

Points - final score

It results that all values, for all of the age categories, are higher in the final test, indicating a progress regarding the psycho-motor skills.

The object grabbing test, for all age categories.

All of the values recorded in the final test are higher than the values recorded in the initial testing.



We can emphasize a few aspects regarding the dynamics of the progress of the object grabbing ability. The final values are higher in this case also than the initial ones. Regarding the development of the psycho-motor age, this aspect is relevant for the last three categories of subjects.

Conclusions

- The activities performed in the aquatic environment have transcended the title of training stage for learning how to swim, and have gained a status of component of the physical education field, thus a new phrase being created, "aquatic education."
- The aquatic activity performed at an early age strengthens the child's self-confidence and independence, through the freely performed water movements, and presents a real interest by influencing the child's psycho-motor skills.
- The assessment of the psycho-motor development can be done on the basis of longitudinal or transversal studies. We opted for a longitudinal study of only eight weeks, in order to reduce the inherent influence of the dependent variable, the **chronological age**.
- The characterization of the shape of the distributions emphasizes the high occurrence of skewness, right, or left, excess or kurtosis (platykurtic), bi-modality or multi-modality, associated with a high spread of the values, in all tests and age categories of the subjects, this signifying a high heterogeneity, even in these categories with ages of close values.
- Taking into consideration all of the age categories, the greatest expansion regarding the reflex activity is found in the 7-12 months category, in which the psycho-motor performance is 3 months above the chronological age.
- The progress of the psycho-motor age, from the initial to the final tests, expressed in months, is as follows: **"Non-locomotor"** 2.18 - 4.37; **"Locomotor"** 2.24 - 2.9*;* **"Object manipulation"** 2.9 - 2.93; **"Object grabbing"** 2.82 - 6.1.
- With just a few exceptions, in all age categories and tests, the average final values are higher than the initial ones. With the exception of the **reflex** test, in the case of the other tests, several differences between the age categories can be mentioned, regarding the "**psycho-motor age"** progress, expressed in months:
  - For the tests **"Locomotor"** and **"Object manipulation,"** the progress is between 2-3, 2.5-3 and 3-4 months;
  - A higher progress was recorded for the tests **"Non-locomotor,"** between 2 and 7 months, and **"Object grabbing,"** between 3 and 8 months.
- Based on the results obtained during the final tests, we can say that our hypothesis, "*The practice of physical exercise in an aquatic environment stimulates the psycho-motor development in infants"* was confirmed.

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Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
Vol. XII, ISSUE 2 Supplement 2012, Romania
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Content

❖ SPORT AND PERFORMANCE

❖ PHYSICAL EDUCATION AND SPORT

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Requirements for the elaboration of the scientific papers (2009-2012)

Structure of the experiment type paper:

- the title of the paper will be written with Majuscules, Times New Roman, Size 12, Bold, Align Left;

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-under the author's name, the department /departments and institution / institutions it is e-mail address for the corresponding author;

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-Abstract, Key words, Introduction, Methods, Results, Discussion, Conclusions, References.

Abstract

The structured abstract and 3-5 key words will be written with Times New Roman, Size 10, Justified.

The abstract must not contain more than 150 words for unstructured abstracts essay type and 200-400 words for structured abstracts experiment type. The abstract must be elaborated in English language. In the abstract there will be no abbreviations used.

The structured abstract for **the experiment type paper** must contain:

- the aim / purpose / object of the research;
- the procedures and methods of research subjects, applied tests;
- the results / main results;

-discussions and conclusions;

- key words between 3 and 5 key words, which punctuates the interest areas of the article;

The aim, purpose, object, methods, results, discussions, conclusions and key words have to be written bold and minuscule.

I**ntroduction**
Procedures and methods of research (subjects, applied tests)
Results
Discussion
Conclusions
All of its will be written Times New Roman, Size 10, Justified, two columns;
Bibliography
It will be written with Times New Roman, Size 10, two columns, First Line Indent 0 cm, Hanging Indent 1cm, Left Indent 1cm. The names of the articles / book will be written in italics.
Author's name has to be written with bold and majuscule (eg.**SMITHOSCKY, M.,2011**)

Structure of the essay type paper:

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- **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;
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For the abstract - essay type paper

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- the content of the research hort summary);
- conclusions main conclusion);
- key words between 3 and 5 key words, which punctuates the interest areas of the article);

Details:

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.

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. The hypotheses of the paper must be clear and concise.

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

	Feminine subjects n=21	
Variables	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.

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)

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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 ºC), 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.;
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- 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
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