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THE ROLE OF SELF MOTIVATION IN THE AFFECTIVITY OF HUNGARIAN AND TRANSYLVANIAN STUDENTS AGED 11-18 FOR PHYSICAL EDUCATION AT SCHOOL

PÁL HAMAR[1], ANIKÓ VERSICS [1], ISTVÁN KARSAI[2], & ISTVÁN SOÓS[3]

ABSTRACT. One of the most significant factors of school education is motivation and motivating. In this study, motivation is not primarily looked at as a psychological phenomenon but much rather as a question of learning physical education or learning as a whole process at school. Applying the self-motivation questionnaires used in psychological tests we endeavour to find answers to our hypotheses which state that student-motivating factors in the process of the acquisition of physical education at school such as performance, determination, tenacity, reliability, love of comfort, a desire to relax, search for distraction or taking no risk are present to a large extent and are interrelated. Our further hypothesis is whether the motivational factors, mentioned above, are subject to gender as well as age. The sample tested comprised 3941 students, comprising 2840 boys and girls from Hungary and 1101 boys and girls from Transylvania. The method of a cross-sectional design was based on a survey by employing questionnaires. This self-report measures on motivation consisted of 36 questions, by which subjects were assessed on a five-point Likert-scale. Our test hypotheses have been validated in the case of both Hungarian and Transylvanian students because during the process of acquiring physical education at school, a dominant role is played by the factors examined by us and they are interrelated. In addition, motivating factors playing a significant role in physical education classes manifest themselves typically in relation to gender and age.

***Keywords*:** self motivation, physical education, Hungarian and Transylvanian Students

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Introduction

One of the tendencies characterizing the changes taking place in the field of pedagogical research in the 21st century is the focus on affective factors. This is shown by the fact that more and more attention is given to the examination of emotional-volitional dimensions which influence effective learning and determine performance (Csapó, 2000). One of the most significant factors of school education is motivation and motivating.

Generally speaking, *motivation* is a generic term referring to the background and drives of human actions. It is responsible for activating behaviour, guiding and sustaining it until a goal-directed behaviour results in the gratification of motivation. If that happens, we talk about conditions of pleasure, satisfaction, indifference or saturation. Classical approach makes a distinction between two basic types of human-specific motivation: *extrinsic* and *intrinsic* motivation. The former contains drives the aim of which is to satisfy a desire, to gain some profit or perhaps to avoid damage. This means that external factors play a role here, in fact, the action has a character typical of means. In contrast, intrinsic motivation is characterised by the fact that here the action and the pleasure involved in the action are the goals that is why the activity is self-rewarding (Szabó, 2004).

The motivational background of a particular action is often complex, it is shaped by both extrinsic and intrinsic drives. Today, the view that human-specific drives are motivated either extrinsically or intrinsically cannot be adhered to. It is much more typical to find different combinations of the two types of motivation (Pintrich and Schunk, 1996).

For our topic (see self-motivation), relevant points include human-specific intrinsic drives, i.e. competence motivation, interest and performance drive. *Competence motivation* can be observed in childhood, mainly in the form of playfulness (observation, grabbing hold, crawling, walking, attention, language and thinking, learning about new objects, shaping one's own surroundings, etc.), later manifestations are based on these. *Interest* is a special case of intrinsic motivation, which is typically an object-bound drive of behaviour. Interest can be significantly influenced by external factors. Typically, it involves positive emotions, which is not always the case with intrinsic motivation (Hidi, 2000).

In physical education and sports activities, immense significance is attached to the so-called *performance motivation*. In his theory, Atkinson (1993) breaks down performance motivation into three components.

These are:

- motivations: drives to achieve success and to avoid failure,
- the subjective likelihood of success/failure (the difficulty of a given task),
- the attraction of achieving/avoiding a goal.

Success orientation and *failure avoidance* are drives present at the same time. However, there are significant individual changes according to whether the desire to achieve success or the drive to avoid failure assumes the central role in an achievement-driven situation. A given motivation is determined by the fact whether the motivation of success orientation or that of failure avoidance is stronger in a situation in which a task needs to be performed. A success-oriented person is primarily motivated to act by potential success. This person is even willing to take (realistic!) risks in challenging situations. People with a failure-avoiding character have a stronger desire to avoid failure than their hope to achieve success so the level of motivation to perform is lower (Szabó, 2004).

Dishmann and Sallis (1994) in their study are intending to answer what might motivate a child to do regular physical activity and how this can be influenced. Among others, psychological, biological, behavioural and socio-demographic characteristics are mentioned. They specifically mention self-motivation, attitude and preference as factors which play a significant role in this area (Dishmann and Sallis, 1994).

Regarding to motivation in schools, the most important question is how to educate children, to make sure they wish to possess intrinsic motivation and a desire to learn, furthermore gaining knowledge. From this pedagogical point of view, the most important aim is to be able to employ effective motivation to make children act out of keen interest. Today, in the age of lifelong learning, a real pedagogical challenge is present by raising and developing children's interest, as well as their desire to learn and to do self-study (Szabó, 2004).

In school education, a motivating effect can only be achieved by developing a certain activity, event (like learning by doing), and also managing student role or teaching material interesting (i.e. by raising students' interest). In a somewhat simplistic manner we can say that keen interest makes motivation accessible to pedagogical application. This, however, does not mean that in school education raising students' interest is the only possible form of motivation. A physical education teacher can employ several other motivating means and methodological procedures, including *the formulation of realistic expectations, rewarding performance, feedback to assessment, explanation, demonstration, or assigning individual exercises,* etc. (Rétsági and Hamar, 2004).

Aims and hypotheses

In our research, motivation is not primarily looked at as a psychological phenomenon but much rather as a question of learning physical education or learning as a whole process at school. In a general approach to the issue, we are looking for the answer to the question what conditions and possibilities there are to create, sustain and enhance motivation in physical education at school. This means motivation and motivating are made the subjects of our analysis as pedagogical functions.

Our research is composed of two parts. The objective of our first questionnaire-based investigation was to examine the emotional reactions to physical education at school of students in a given age group (11-18 years) and from two regions (Hungary and Transylvania) during physical education classes. To explain it more precisely: we wished to survey the individual characteristics and defining factors of the affectivity of 11-18 year-old Hungarian (Hamar and Karsai, 2008; Hamar, Karsai and Munkácsi, 2011) as well as Transylvanian (Hamar and Karsai, 2010; Hamar et al, 2011) boys and girls towards physical education through positive and negative reactions. We thought it was important to find the emotions related to physical education classes which play a defining role in the process of teaching and learning physical education.

Applying the self-motivation questionnaires (Dishman and Ickes, 1981) used in psychological tests we assumed that we would receive reinforcement of the results of our survey examining emotional reactions. We would like to investigate if achievement orientation, tenacity, reliability, love of comfort, fun seeking or avoidance of risk taking are present to a large extent in pupils and whether these factors are interrelated or not. Our further hypothesis is whether the motivational factors, mentioned above, are subject to gender as well as age.

As a further objective of the research we wished to explore the role of self-motivation in the affectivity towards physical education at school not only in Hungary but also in Transylvania, a unique part of Europe in respect of body culture as well. We had two reasons for selecting this location. Firstly, because very little research of this kind has been carried out there. Secondly, because that geographical area has unique socio-cultural features. This also means that relationships between Hungarian and Transylvanian students are also examined.

Subjects and methods

Participants

Data were collected from a randomly-selected population, i.e. Hungarian and Transylvanian male and female students between the ages of 11-18. The sample tested comprised 3941 students, comprising 2840 boys and girls from Hungary and 1101 boys and girls from Transylvania. Distribution of students according to sex and age is shown in Table 1.

Data collection of Hungary took place in 5 schools in Budapest as well as 21 schools in the country. The following schools, from settlements beside the capital city, took part in the study: Balatonboglár (Somogy county); Berettyóújfalu (Hajdú-Bihar county); Békéscsaba (Békés county); Gamás (Somogy county); Győr (Győr-Moson-Sopron county); Gyula (Békés county); Hajdúhadház (Hajdú-Bihar county); Jászberény (Jász-Nagykun-Szolnok county); Kistarcsa (Pest county); Látrány (Somogy county); Szentendre (Pest county); Szombathely (Vas county);

Tokodaltáró (Komárom-Esztergom county). The institutes of education included primary schools, primary and secondary grammar schools, Catholic primary and secondary grammar schools, primary and music schools, primary and secondary technical schools, secondary grammar schools, secondary technical schools, secondary technical and grammar schools, vocational schools and boarding vocational schools.

Table 1.

Distribution of subjects tested according to gender, age and geographical unit (per capita)

	Gender/Age	*11-12 years*	*13-14 years*	*15-16 years*	*17-18 years*	*Total*
Hungarian	Boys	244	359	517	247	1367
	Girls	304	387	519	263	1473
	Total	**548**	**746**	**1036**	**510**	**2840**
Transylvanian	Boys	88	130	89	104	411
	Girls	102	156	190	242	690
	Total	**190**	**286**	**279**	**346**	**1101**
Hungarian and Transylvanian	**Total**	**738**	**1032**	**1315**	**856**	**3941**

Data collection of Transylvania took place in six schools in Arad and in Odorheiu Secuiesc. Educational institutions participating in the tests included Elena Ghiba Birta National College, Csiky Gergely School Group, Generalà No. 4 „Ioan Slavici", Liceul de Artà „Sabin Dràgoi", Liceul Pedagogic „Dimitrie Tichindeal" and Eötvös József Agricultural Secondary Technical School.

Instruments

The method of a cross-sectional design was based on a survey by employing questionnaires. This self-report measures on motivation consisted of 36 questions, by which subjects were assessed on a five-point Likert-scale (see Appendix). This questionnaire has already been used by Biróné (1994) during some of her research. The original questionnaire was developed by Dishman and Ickes (1981), later modified by Svoboda and Jansa (1987). Data collection took place in the academic year 2006/2007 with the assent of school directors as well as in cooperation with PE teachers.

Data analysis

The 36 questions of self motivation formed six factors (F). The six self-motivation factors were assigned letter codes (which follow each factor):

1. Achievement orientation (Fv)
2. Tenacity (Fc)

3. Reliability (Fs)
4. Love of comfort (Fp)
5. Fun seeking (Fr)
6. Avoidance of risk taking (Fbr)

Six items belong to each factor that are the following: Fv - 3., 18., 19., 29., 33., 36.; Fc - 5., 9., 20., 21., 27., 35.; Fs - 6., 10., 12., 15., 23., 24.; Fp - 4., 14., 17., 22., 25., 32.; Fr - 1., 2., 7., 8., 26., 30.; Fbr - 11., 13., 16., 28., 31., 34.

The dominant inclination (aptitude) of the personality could be determined with the aid of the questionnaire. The first three factors (achievement orientation, tenacity and reliability) represented positive motivation, while for love of comfort, fun seeking and avoidance of risk taking factors represented negative motivation towards competition and performance.

Thus, the factors involving positive and negative motives do not contrast or are not opposite of each other, but located on a certain continuum. Each factor has a distinct quality. Regarding the variety of negative as well as positive answers in the questionnaire, data were homogenized before being processed on the computer. Regarding three reverse scored factors (Fp, Fr, Fbr), where value 1 demonstrated a negative answer, values were reversed, as value 1 became 5, value 2 became 4, and so on. Value 3, of course, remained the same.

Following descriptive statistical analysis, we performed a three-way analysis of variance (2*2*4 between-subjects ANOVA, region*gender*age group) and Bonferroni Post Hoc test was employed in order to examine the differences between genders (female, male) and age groups (students are allocated in age groups of 11-12, 13-14, 15-16, 17-18). To investigate the distribution of factor values (Fv, Fc, Fs, Fp, Fr and Fbr) among the individual groups, Kolmogorov Smirnov test was computed while homogeneity among groups was determined by the Leven's test. Differences were significant if the criterion value of $p<0.05$ was achieved. The statistical analyses were performed in the SPSS v.20 software package (SPSS Inc., Chicago, Illinois, USA).

Results

Based on the results of distribution tests according to region, gender, age groups as well as the examination of the homogeneity of variances between groups we have drawn the conclusion that our data met the requirements of employing parametric statistics.

In the case of Hungarian students as a general conclusion, we can say that factors of positive characters (Fv, Fc and Fs) that were related to physical education as a manifestation of physical activity, had a higher value with respect to both girls and boys (see Table 2) than factors of negative characters (Fp, Fr and Fbr) while dispersion values (SD) remained relatively low.

Table 2.

Descriptive statistical data of Hungarian students according to gender and age

	11-12 years				13-14 years				15-16 years				17-18 years			
	Boys		Girls		Boys		Girls		Boys		Girls		Boys		Girls	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Fv	3,32	0,74	3,48	0,74	3,30	0,76	3,21	0,68	3,35	0,71	3,18	0,67	3,39	0,65	3,24	0,72
Fc	3,35	0,54	3,29	0,58	3,25	0,57	3,24	0,52	3,28	0,48	3,23	0,48	3,27	0,44	3,22	0,43
Fs	3,44	0,64	3,53	0,60	3,34	0,61	3,37	0,59	3,42	0,56	3,36	0,54	3,38	0,61	3,33	0,54
Fp	2,65	0,76	2,57	0,63	2,78	0,72	2,85	0,61	2,72	0,61	2,91	0,66	2,72	0,59	2,94	0,57
Fr	2,77	0,76	2,81	0,72	2,91	0,72	2,95	0,60	2,87	0,66	3,11	0,62	2,89	0,61	3,03	0,60
Fbr	3,04	0,79	3,02	0,73	3,00	0,76	3,13	0,64	3,02	0,64	3,19	0,65	2,96	0,62	3,16	0,66

As a general conclusion with Transylvanian students we can say that factors of a positive (Fv, Fc and Fs) character which are related to physical education as a manifestation of physical activity as well as risk avoidance (Fbr) as a factor of negative character had higher values with both girls and boys than factors with a negative character such as love of comfort (Fp) and a desire to relax or search for distraction (Fr) (Table 3).

Table 3.

Descriptive statistical data of Transylvanian students according to gender and age

	11-12 years				13-14 years				15-16 years				17-18 years			
	Boys		Girls		Boys		Girls		Boys		Girls		Boys		Girls	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Fv	3,08	,71	3,11	,67	3,18	,69	3,18	,61	3,29	,62	3,22	,61	3,34	,62	3,29	,57
Fc	3,33	,68	3,43	,61	3,29	,61	3,44	,52	3,30	,52	3,51	,53	3,37	,57	3,43	,51
Fs	3,30	,75	3,34	,65	3,22	,71	3,54	,62	3,45	,57	3,52	,49	3,40	,65	3,50	,56
Fp	2,72	,71	2,88	,67	2,78	,69	2,88	,72	2,72	,62	2,80	,65	2,93	,73	2,83	,57
Fr	2,96	,71	3,08	,64	3,17	,61	3,09	,62	3,03	,53	3,12	,57	2,99	,71	3,01	,54
Fbr	3,31	,76	3,26	,71	3,25	,67	3,28	,63	3,31	,75	3,44	,66	3,24	,64	3,33	,58

As regards the factor of performance orientation (Fv), when comparing the Hungarian and Transylvanian results according to sex and age groups the most significant difference with boys is found in the age group of 13-14 year-olds (Figure 1) whereas with girls, it is found with 11-12 year-olds (Figure 2). The most conspicuous difference is seen with 11-12 year-old girls.

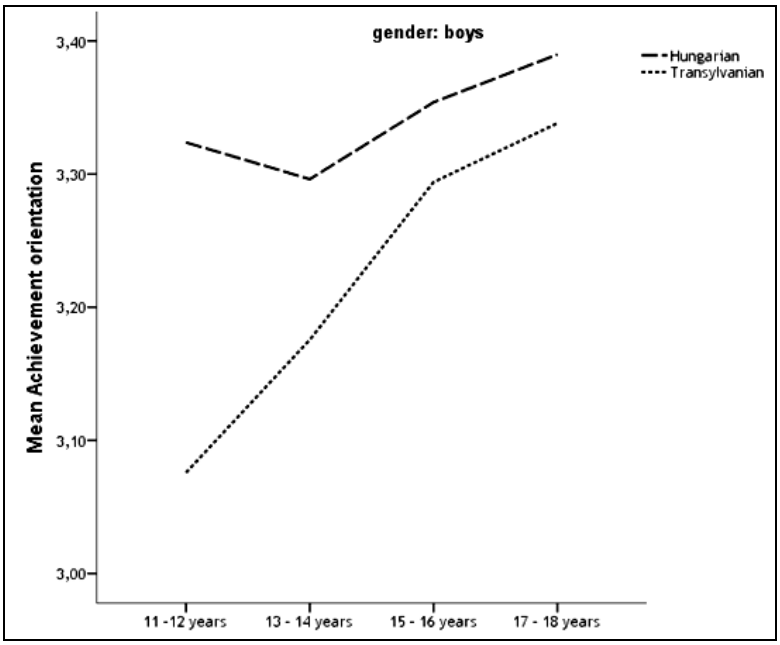

Figure 1. The mean values of factor "Fv" of Hungarian and Transylvanian boys students according to gender and age groups

As regards the determination or tenacity factor (Fc), with the exception of 11-12 year-old boys there exist large differences with both sexes and all age groups (Figures 3 and 4). In every age group, lower values are present for Hungarian girls than for Transylvanian ones. In striking contrast to this, the trend is reversed with boys, i.e. Hungarian boys show higher values up to the age of 17-18 years where, however, Transylvanian boys have higher values.

With the reliability (Fs) factor, the picture is more complex in the case of girls (Figure 6). There are significant differences between Hungarian and Transylvanian girls for every age group. However, while this value is higher for Hungarian girls with the age group of 11-12, in all other age groups it is higher with Transylvanian girls. With the exception of 13-14 year-olds, boys (Figure 5) indicate the same trend.

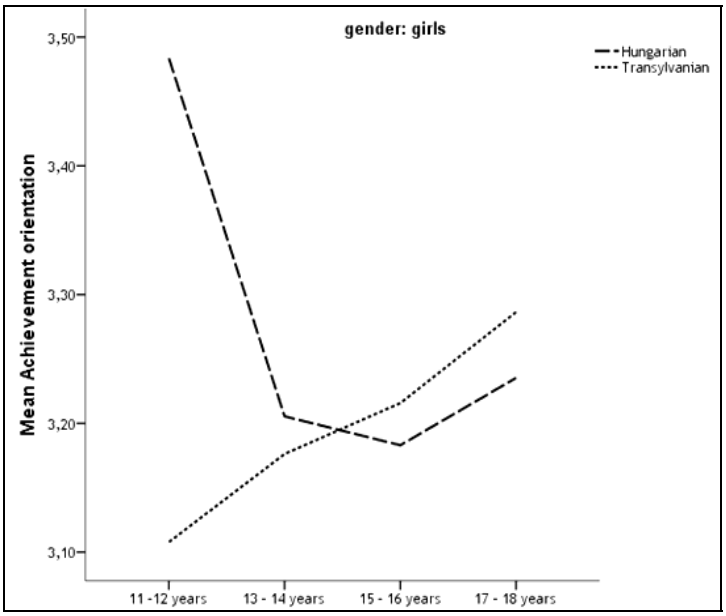

Figure 2. The mean values of factor "Fv" of Hungarian and Transylvanian girls students according to gender and age groups

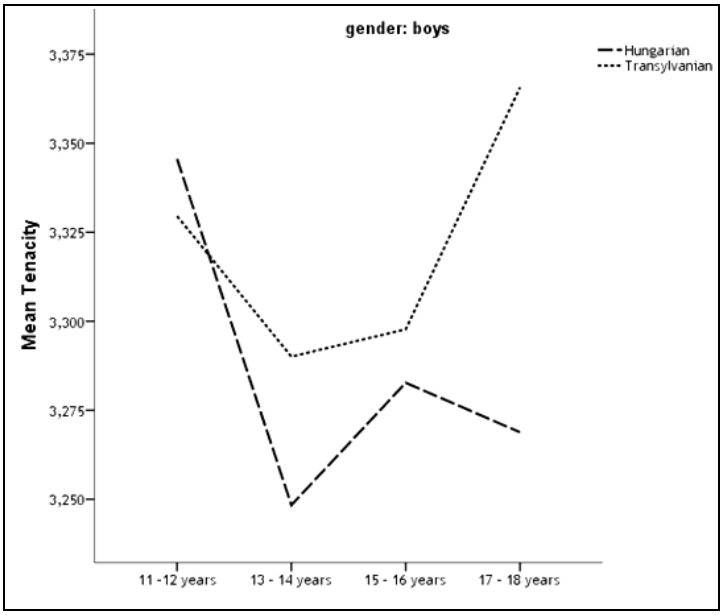

Figure 3. The mean values of factor "Fc" of Hungarian and Transylvanian boys students according to gender and age groups

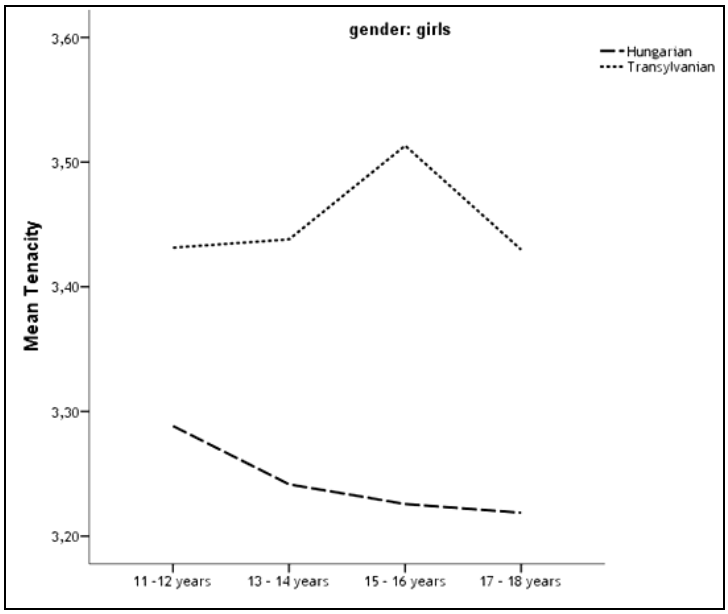

Figure 4. The mean values of factor "Fc" of Hungarian and Transylvanian girls students according to gender and age groups

Figure 5. The mean values of factor "Fs"of Hungarian and Transylvanian boys students according to gender and age groups

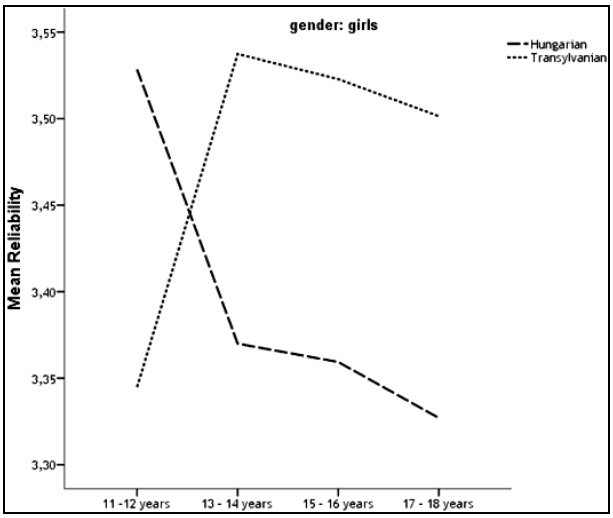

Figure 6. The mean values of factor "Fs" of Hungarian and Transylvanian girls students according to gender and age groups

As regards the love of comfort (Fp) factor, both boys (Figure 7) and girls (Figure 8) show nearly the same values – with some minor differences. There are two significant differences between the two genders, notably with the 17-18 year-olds in the case of boys and with the 11-12 year-olds in the case of girls. Both local values are higher for Transylvanian students.

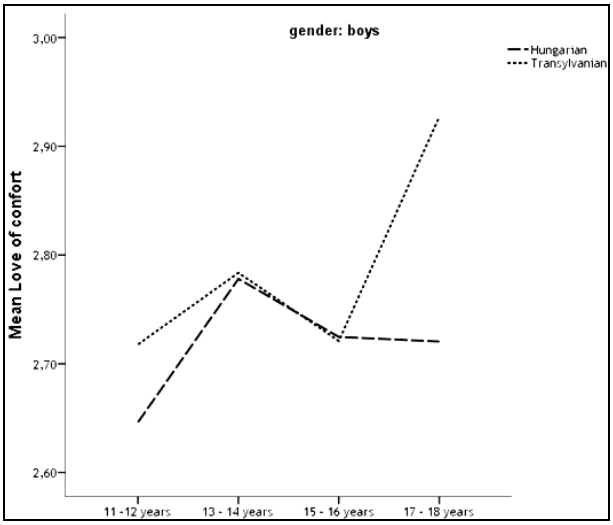

Figure 7. The mean values of factor "Fp" of Hungarian and Transylvanian boys students according to gender and age groups

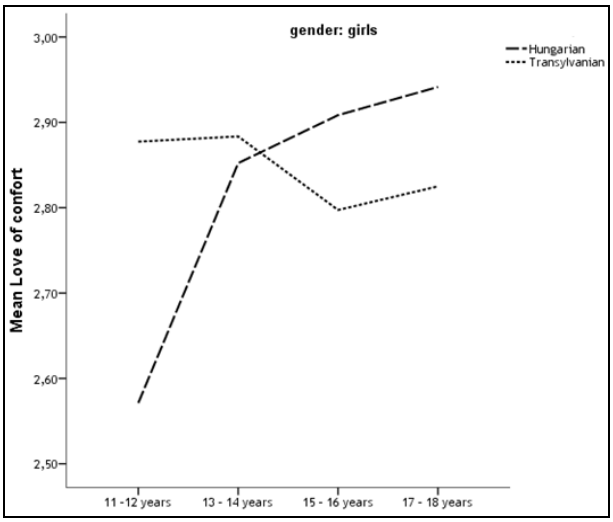

Figure 8. The mean values of factor "Fp" of Hungarian and Transylvanian girls students according to gender and age groups

The test results show that with the desire to relax or search for distraction factor (Fr factor) significant differences (Figure 10) are only present with younger, i.e. with 11-12 and 13-14 year-old Hungarian and Transylvanian girls. Boys (Figure 9) are basically on the same level, with minor deviations from either one or the other area.

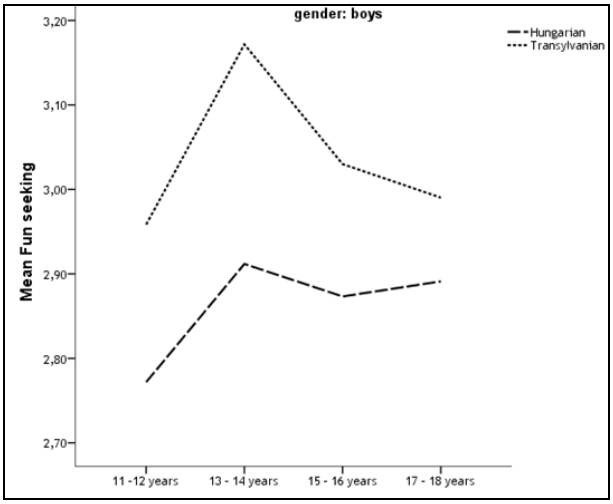

Figure 9. The mean values of factor "Fr" of Hungarian and Transylvanian boys students according to gender and age groups

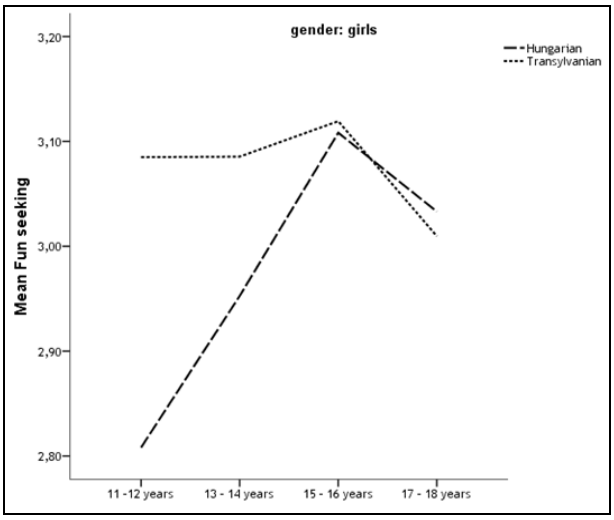

Figure 10. The mean values of factor "Fr" of Hungarian and Transylvanian girls students according to gender and age groups

With the risk avoidance (Fbr) factor, the chart for girls (Figure 12) shows a resemblance to the tenacity factor (Fc), which means that lower values are present in all age groups for Hungarian girls than for Transylvanian ones. Regarding to boys' values (Figure 11), there are no major differences up to the age group of 17-18 year-olds, in which age Transylvanian boys take on significantly higher values.

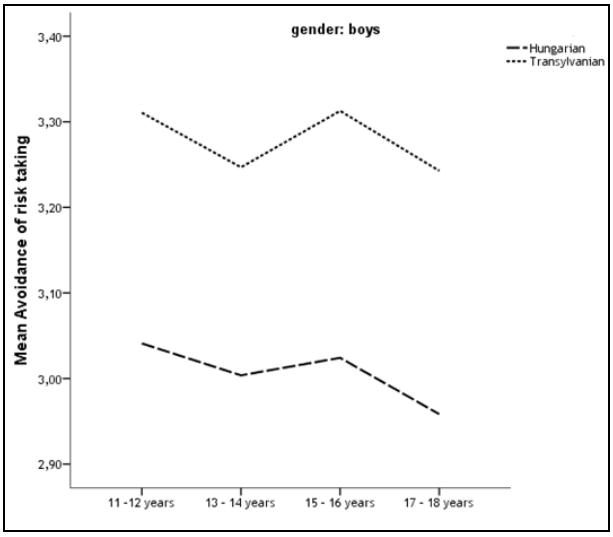

Figure 11. The mean values of factor "Fbr" of Hungarian and Transylvanian boys students according to gender and age groups

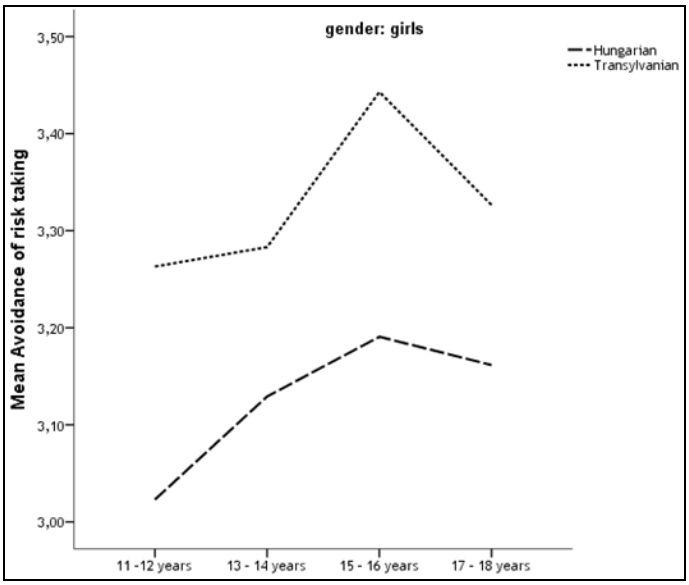

Figure 12. The mean values of factor "Fbr" of Hungarian and Transylvanian girls students according to gender and age groups

Based on the results (Table 4) of the three-sample analysis of variance and those of the Bonferroni Post Hoc test we can conclude that within the categories of sexes (boys, girls) and age groups (11-12, 13-14, 15-16, 17-18 year-old students) the geographical areas in question (Hungary, Transylvania) display the largest number of significant differences – notably five – with Fp (love of comfort) and Fr (desire to relax, search for distraction) factors while the smallest number of differences – notably two – can be found with the Fbr (risk avoidance) factor.

Table 4.

Results of the between-subjects ANOVA test

	Region	Gender	Age group	Region*Age group	Region*Gender	Gender*Age group	Region*Age group*Gender
Fv	***	**	NS	***	NS	**	NS
Fc	***	NS	**	NS	***	NS	NS
Fs	NS	NS	**	***	**	*	NS
Fp	*	***	***	**	NS	NS	***
Fr	***	***	***	*	NS	*	NS
Fbr	***	NS	***	NS	NS	NS	NS

*= p<0,05; **=p<0,01; ***=p<0,001

Summary and conclusions

During our research we examined the level of self-motivation and its composition on the basis of self-esteem. A dominant factor of self-esteem is the assessment of participation in a given activity. The procedure we applied set the aim for the subjects tested to assess themselves regarding to the attitude of their own personality by answering the questions while making judgements. This method of testing proved to be a favourable methodology for physical education, which is based on active exercise in a task-oriented way (see also Biróné, 1994). Our results showed an overwhelmingly positive self-motivation.

Our test hypotheses have been accepted both for Hungarian and Transylvanian students because the results of our questionnaire testing emotional reactions have been reinforced (see Hamar and Karsai, 2008; Hamar and Karsai, 2010). During the process of acquiring physical education at school, we uncovered that a dominant role is played by the factors that were examined and they are interrelated. In addition, motivating factors playing a significant role in physical education classes manifest themselves typically in relation to gender and age.

It was revealed by age groups that both in Hungarian and Transylvanian participants, the positively characterised factors (achievement orientation, self-determination, perseverance and reliability) in self-evaluation are dominant qualities. In Hungarian students the positively characterised factors (Fv, Fc, Fs) have shown higher values in both genders, than the negative factors (Fp, Fr and Fbr). In Transylvanian students the same trend has emerged, only risk avoidance (Fbr) - as it's having negative content - factor also has shown higher value, than the Fp and Fr labelled negative content factors. The Transylvanian data of the risk avoidance factor are somewhat surprising, as the investigated age group is rather seeking for risks, undertaking risks, than avoiding them. The suspected explanation can be due to the curriculum selection and/or teaching method procedure of the physical education teachers in the investigated schools. Our results demonstrate gender differences in connection with pubertal development, which is similar to the age groups examined by us, and the emerging and maturing personality profile.

Our results on self-motivation are directly related to the image we have had about the affective characteristics of physical education at school and about students' attitudes in as much as – basically positive – emotional bonding with physical education is based on performing tasks, successful achievement and trust in oneself – even with a higher level of risk taking and excitement.

In conclusion, we can draw from our test results that by pooling the attitudes of Hungarian and Transylvanian students, as well as their emotional components and their self-motivation, we can state that the way they affect each other displays mutually strengthening tendencies. And this provides a reassuring background for teaching and learning physical education as one of the most important driving factors for physical activity.

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APPENDIX

Questionnaire of self-motivation

Gender: Boy – Girl **Age:**

Instructions: Read the sentences below and circle the number that describes you best. Answer honestly according to the scale below. There is no right or wrong answer. Your answers will remain confidential.

1 Not like me at all
2 Not like me
3 Not like me, not unlike me
4 Somewhat like me
5 Very much like me

1.	I am not very good at committing myself to doing more things at a time.	1	2	3	4	5
2.	Mostly I am able to work with greater effort than other people (my mates).	1	2	3	4	5
3.	I can persevere at stressful tasks, even when they are tiring and unpleasant.	1	2	3	4	5
4.	If an activity is too demanding I prefer giving it up.	1	2	3	4	5
5.	Self-discipline is very important for me.	1	2	3	4	5
6.	I keep promises, especially the ones I made to myself.	1	2	3	4	5
7.	I do not work harder than I have to.	1	2	3	4	5
8.	I rarely exert myself to the max.	1	2	3	4	5
9.	I haven't got goals.	1	2	3	4	5
10.	When I make up my mind to do something, I always bring it to an end.	1	2	3	4	5
11.	I tend to do things until they are not tiring.	1	2	3	4	5
12.	I often make decisions and stick to them.	1	2	3	4	5
13.	I always seek the easiest solution.	1	2	3	4	5
14.	I'm easily discouraged.	1	2	3	4	5
15.	If I tell someone that I do something, he may be sure that I will do it.	1	2	3	4	5
16.	I hate getting tired.	1	2	3	4	5
17.	I am more or less a lazy individual.	1	2	3	4	5
18.	I work harder than most of my friends.	1	2	3	4	5
19.	I can persist in spite of pain and discomfort.	1	2	3	4	5

20.	I like setting goals and working for them.	1	2	3	4	5
21.	Sometimes I make myself more tired than I should.	1	2	3	4	5
22.	I tend to lose my enthusiasm.	1	2	3	4	5
23.	I rarely give it up.	1	2	3	4	5
24.	I am not very reliable.	1	2	3	4	5
25.	I prefer tasks where I have to fight for the solution.	1	2	3	4	5
26.	I easily change my mind.	1	2	3	4	5
27.	I do not tire myself if I do not have to.	1	2	3	4	5
28.	I avoid difficult situations.	1	2	3	4	5
29.	I often tire myself on completely.	1	2	3	4	5
30.	I prefer action to planning.	1	2	3	4	5
31.	I never force myself to do things that I do not like.	1	2	3	4	5
32.	It takes a lot of persuading to induce me to do something.	1	2	3	4	5
33.	When I reach a goal, I set a higher one.	1	2	3	4	5
34.	If I do not succeed, I still do not give it up.	1	2	3	4	5
35.	I always try to reach my goals.	1	2	3	4	5
36.	I usually do what I want to do, and not what I'm told to do.	1	2	3	4	5

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(RECOMMENDED CITATION)

YOUNG STUDENTS AND THEIR BODY IMAGE

IOAN NICULAIE NEGRU[1] & ANDRAS ALMOS[1]

ABSTRACT. *Introduction.* The media promotes an ideal of body image. Most of the individuals desire to be as close as possible to the normal values of the body mass index. While being placed in the "normal weight" category, young people can have a body image with direct and positive influences on self-esteem. *Objectives.* This paper aims at highlighting the existence of a link between the values of the body mass index and the self body image. *Methods and materials.* In this study we have engaged 171 students from the Babeş-Bolyai University. The students involved responded to a series of questions comprised in a questionnaire of 16 items, regarding one's own body image. *Results and conclusions.* The values of the body mass index which determine the real body shape of individuals have a strong influence on the accuracy of perception of their body image.

Key words: body image, young students, body mass index, self esteem

Rezumat. Tinerii studenţi şi imaginea corporală. *Introducere.* Mijloacele media promovează un ideal de apariţie corporală. Indivizii, majoritatea lor doresc să fie cât mai aproape de valorile normale ale indicelui de masă corporală. Situându-se în categoria „ponderali", tinerii pot avea o imagine corporală obiectivă cu influenţe, directe şi pozitive, asupra stimei de sine. *Obiective.* Prin această lucrare am încercat să evidenţiem existenţa unei legături dintre valorile indicelui de masă corporală şi propria imagine corporală. *Metode şi materiale.* La studiul de faţă au participat 171 de studenţi din cadrul Univ. Babeş-Bolyai. Cei implicaţi au răspuns la o serie de întrebări cuprinse într-un chestionar, cu 16 itemi, privind propria imagine corporală. *Rezultate şi concluzii.* Valorile indicelui de masă corporală, ce determină forma corporală reală a indivizilor, influenţează acurateţea percepţiei imaginii corporale.

Cuvinte cheie: imaginea corporal, tinerii studenţi, indice de masă corporală, stima de sine

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Introduction

The term body image can easily be mistaken for that of body shape, but as it appears these two terms are not interchangeable. Through body image we understand "the image of our own body, which we create in our own mind, more specifically the way in which we perceive our body" (Schilder, 1935, apud Roy and Payette, 2012, p. 506).

As a multidimensional construct, the body image is considered a cognitive representation consisting of a series of images, perceptions, sensations that the individual has of his own physical appearance (Verplanken, Velsvik, 2008; Baylei 2008; Roy and Payette, 2012; Burlew, Shurts, 2013). According to the specialised literature, the body image of an individual has two basic components, namely perceptual and attitudinal. The perceptual component refers to the degree of approximating one's own body shape, whereas the attitudinal component involves sensations/feelings of the individual relating to his own body (Gardner, Brown, 2012, apud Coelho et al., 2013).

Objectives

Through this paper, we have tried to emphasize the way in which a series of young people are preoccupied with their own body image and the way in which they are perceived by the other individuals around them.

Materials and Methods

In the current study we engaged a number of N=171 students from the Babeş-Bolyai University. Out of the 171 respondents, 86 are girls and the other 85 are boys. Those involved in the study have responded to a series of questions comprised in a questionnaire of 16 items, relating to their own body image. The study took place during the second semester of the academic year 2012-2013.

Results

The age average of the participants is 22.09 ±7.188 years (chart no.1).

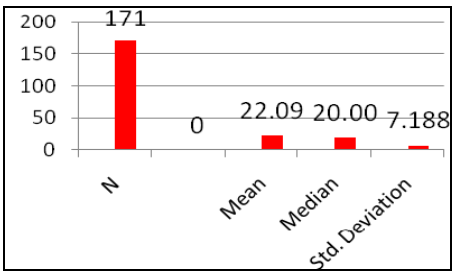

Chart no. 1. Subject's age

The gender differences relating to the body mass index have been highlighted in chart no. 2.

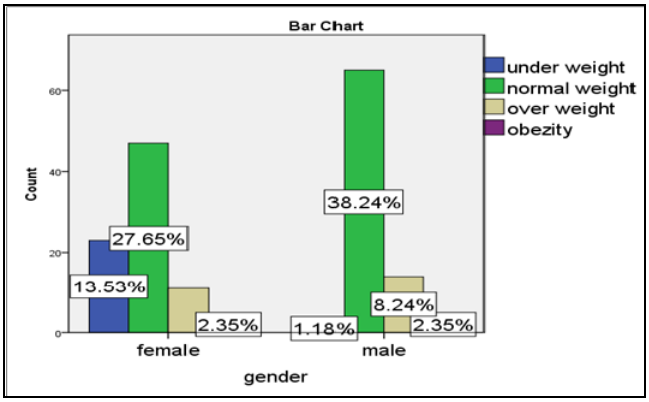

Chart no. 2. Body mass index

The respondents concern towards their own body image is illustrated in chart no. 3.

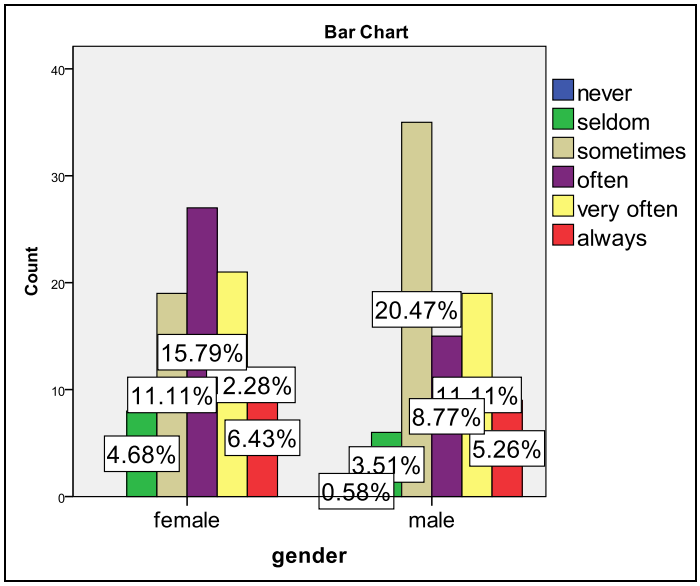

Chart no. 3. Concern towards their own image

The answer to the way in which those surveyed are concerned with certain parts of their bodies is shown in chart no. 4.

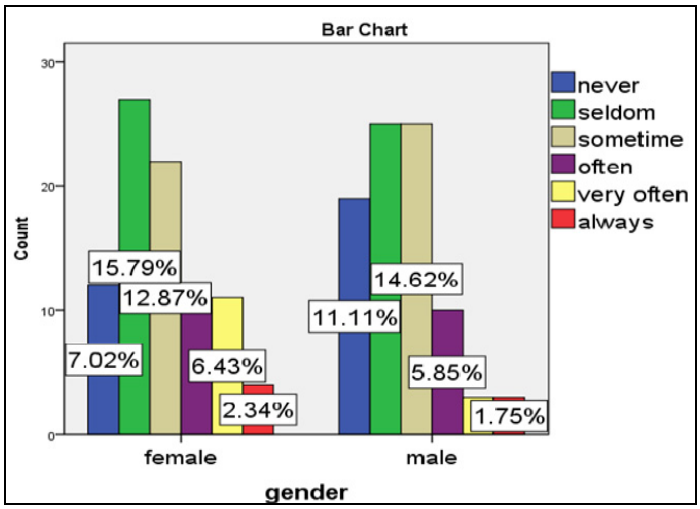

Chart no. 4. Concern with certain parts of the body

Being asked how preoccupied they are in relation to the muscle tone of their own body, the individuals have answered as shown by chart no. 5.

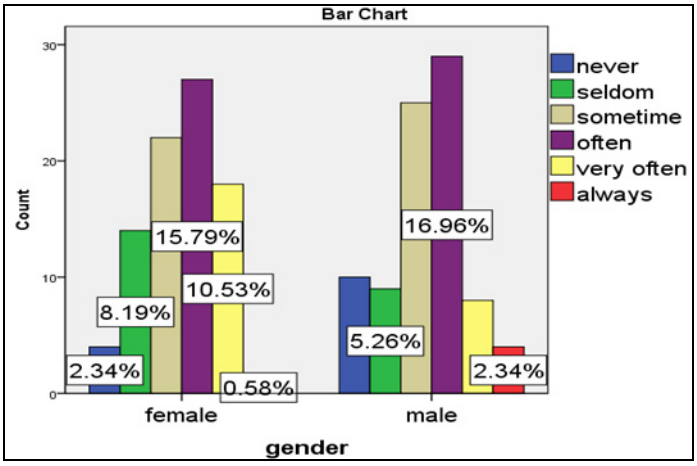

Chart no. 5. Concern with muscle tone

The manner in which the subjects are interested in their body shape, and how much they care whether they are tall or short, thin or overweight, in proportion to the others, has been represented in chart no. 6.

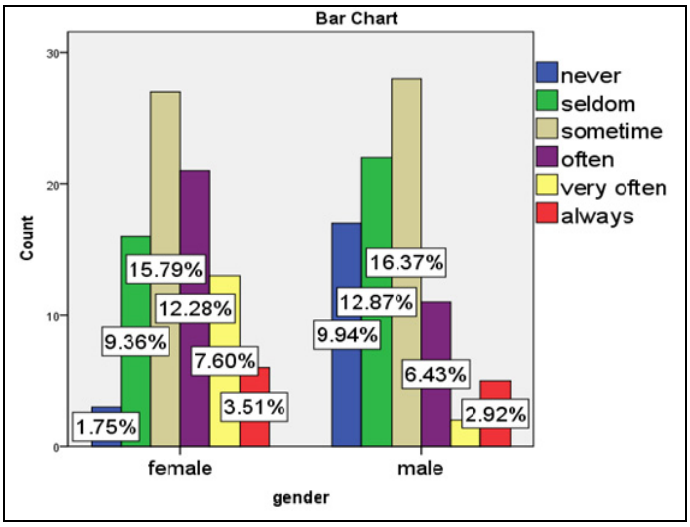

Chart no. 6. Concern towards height, weight and certain body parts

The answers of the participants in the study regarding the tendency to wear certain clothes with the purpose of hiding certain imperfections are shown in chart no. 7.

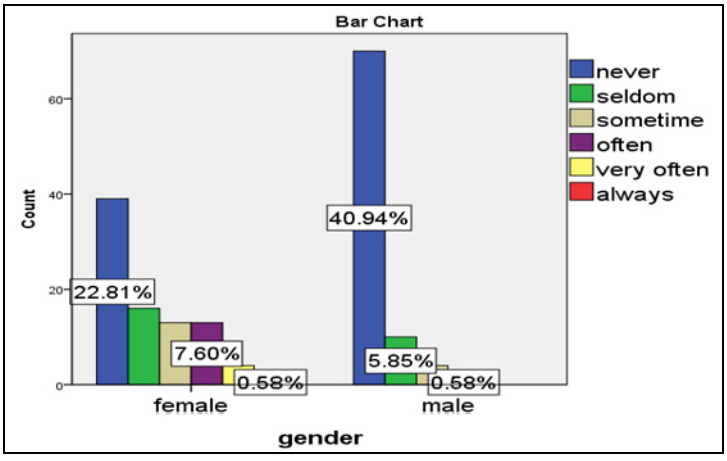

Chart no. 7. Hiding certain imperfections through clothing

The answers to the question relating to the existence of a link between a hyper caloric diet and the perception of the self body image have been shown in chart no. 8.

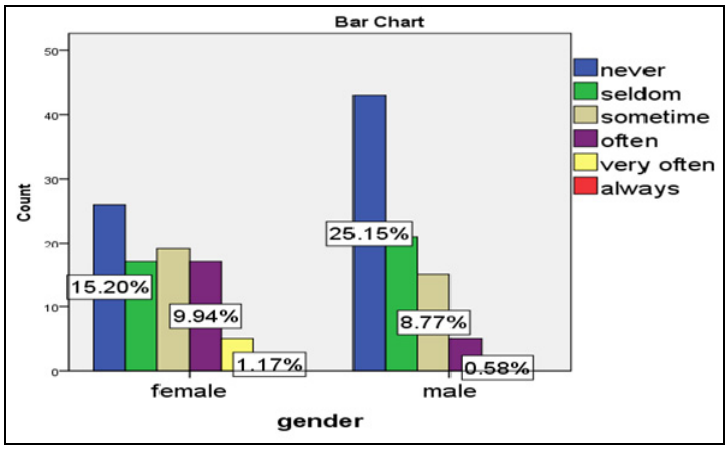

Chart no. 8. Hyper caloric diets and the body image

Asked whether they feel shame or guilt towards their own body, the participants in the study have answered as shown in chart no. 9.

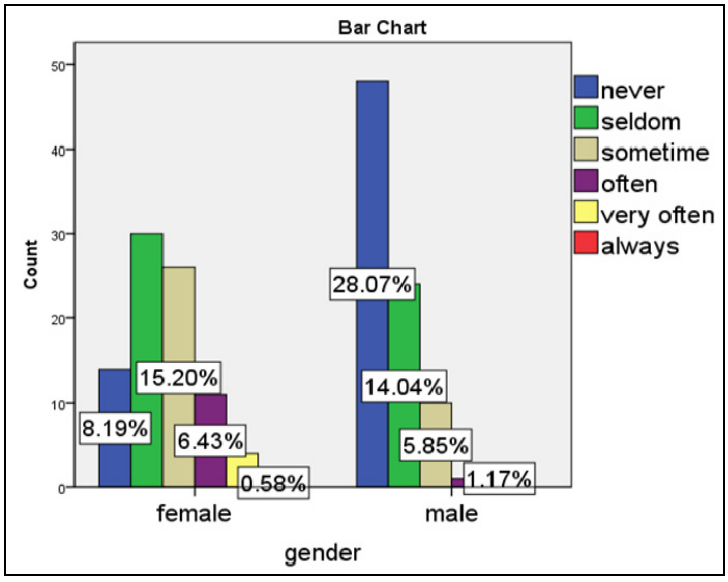

Chart no. 9. Dissatisfaction towards their own body

Questioned whether they have taken on a diet with the aim of improving their body image, the participants have replied as presented in chart no. 10.

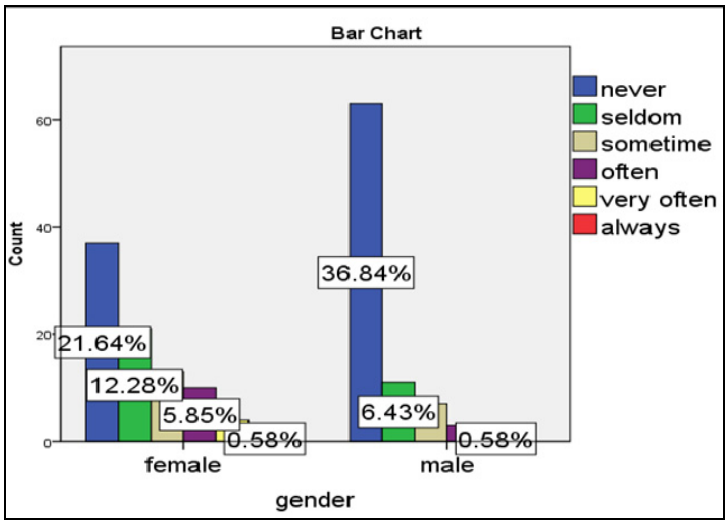

Chart no. 10. Diets and the body image

The answers of the participants regarding their desire to make any changes to their own bodies have been captured in chart no. 11.

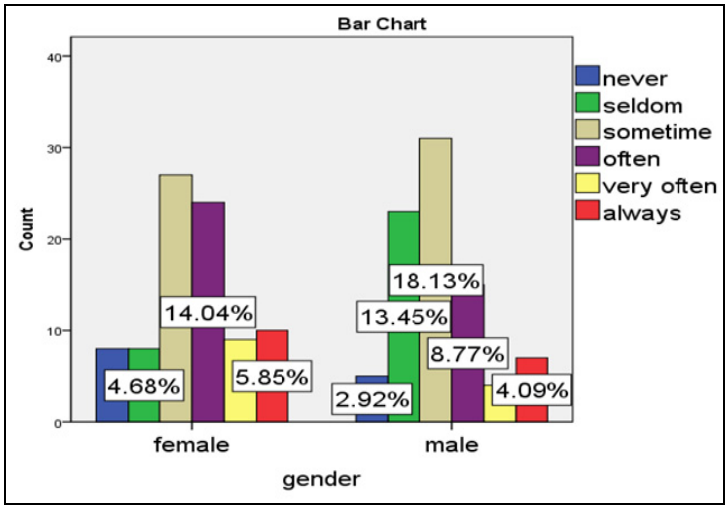

Chart no. 11. The respondents' desire to change something from their own body

Asked whether they are unhappy with the fact that other people around them are better looking, the respondents have answered as shown in chart no. 12.

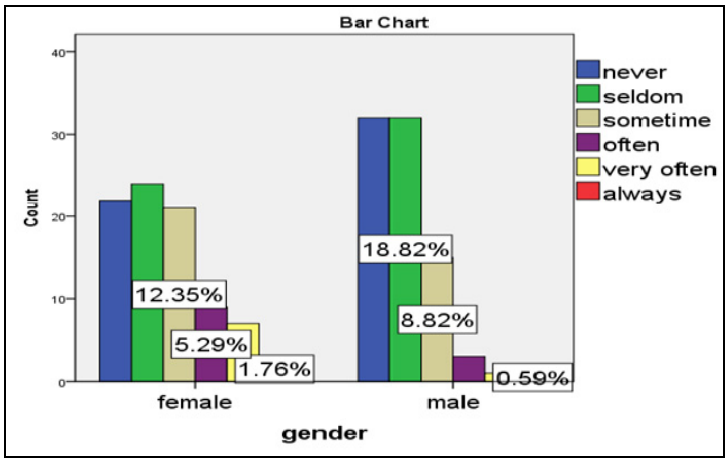

Chart no. 12. The interest towards the appearance of those around

The participants in the study have been asked whether the often compare themselves with those around them and the answered have been gathered in chart no. 13.

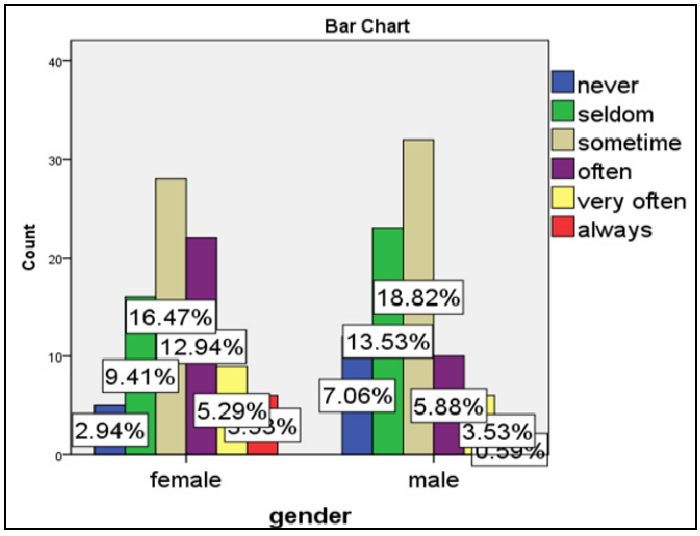

Chart no. 13. Comparing with those around

A large number of respondents are not engaged in physical activities/ sports, this being shown in chart no. 14.

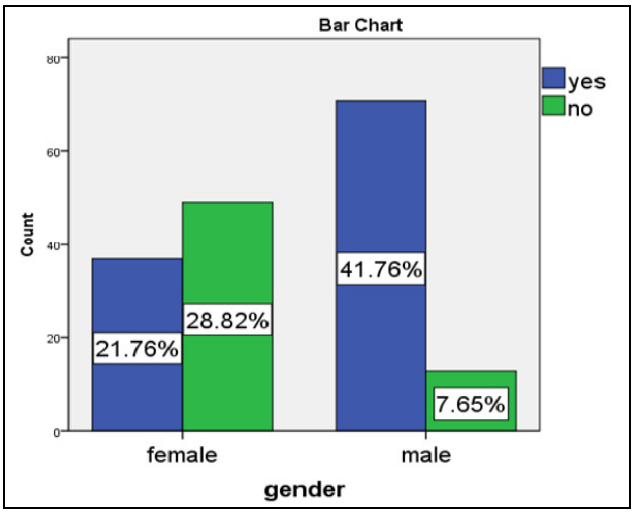

Chart no. 14. Participating in sports activities

Starting from a series of images that represented underweight, normal weight and overweight individuals, the respondents have been asked to identify themselves with one of the images shown. The answers have been represented in chart no. 15.

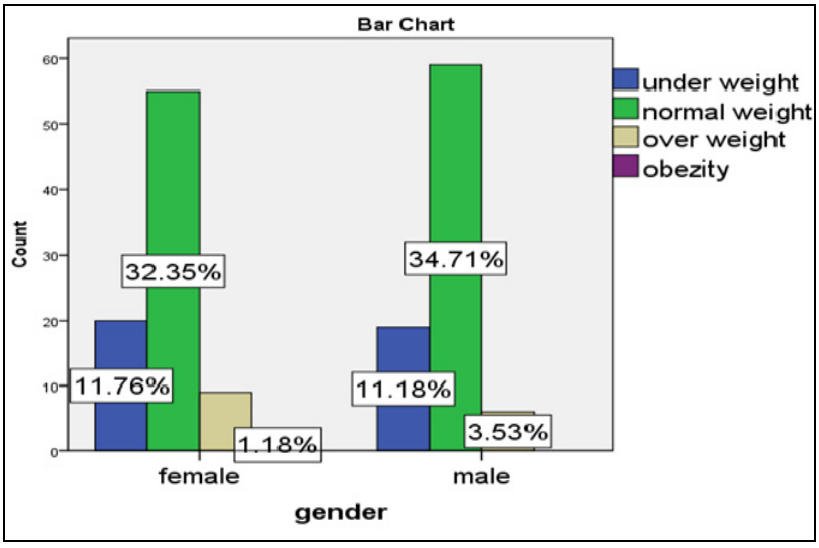

Chart no. 15. Identifying with a series of images

The students have also been asked to identify themselves with a series of images according to how they believed were being perceived by those around them. The images presented underweight, normal weight and overweight or obese people. The answers are presented in chart no. 16.

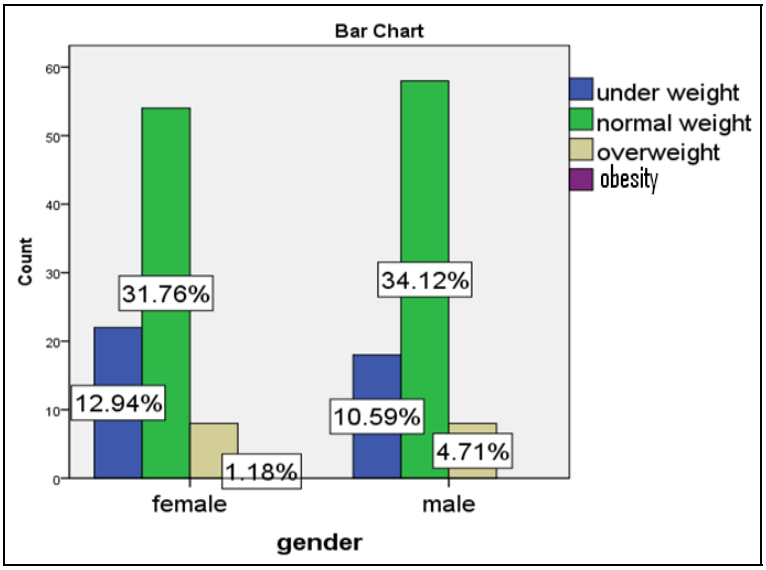

Chart no. 16. The appearance in the eyes of the others

Correlations

		body mass index	Identifying with a series of images under weight, normal weight, overweight, obesity
body mass index	r	1	.489**
	p		.000
Identifying with a series of images under weight, normal weight, overweight, obesity	r	.489**	1
	p	.000	

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

Within a threshold of significance of 0.01, Pearson's correlation coefficient has a value of 0.48, meaning that there is a statistically significant correlation. The values of the body mass index which determine the real shape of individuals influences the accuracy of perception of body image.

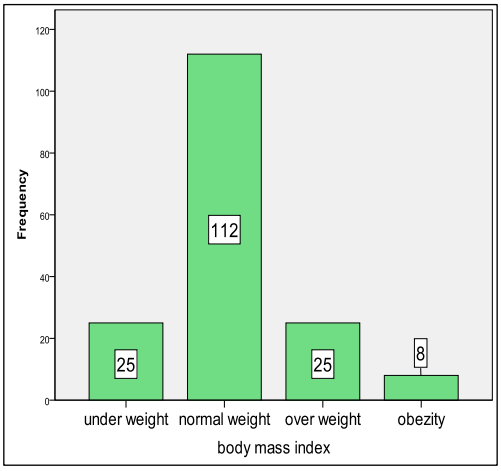

Chart no. 17. Body mass index

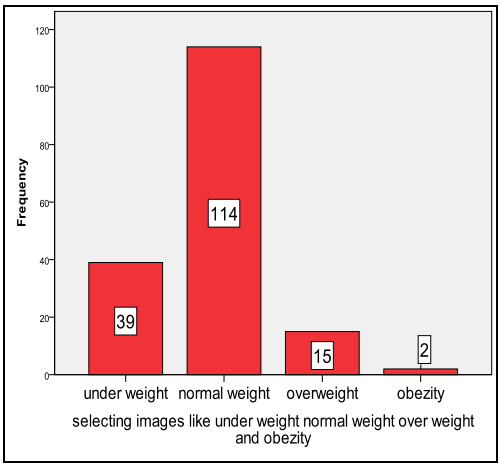

Chart no. 18. Identifying with a series of images

From the above charts, no 17 represents the real values of the body mass index, whereas chart no. 18 stands for the choices made by the subjects relating to a series of images with which they identify themselves. The images we mentioned were in a number of 4, comprising from the point of view of body mass index the four groups of individuals – underweight, normal weight, overweight and obese. From the two charts we can see that individuals generally tend to declare that their body image is superior to the real values of the body mass index. By contrasting the two charts, we can see that the values of the body mass index established the existence of **25 overweight individuals,** whereas **only 15** of those identified themselves correctly with the image corresponding to being overweight. The same situation occurs in the obese category. The values of the body mass index highlight the existence of **8 obese individuals** amongst the participants, whereas **only 2** have identified themselves in the image of the obese person. Differences in value can be seen in the underweight category as well, the body mass index suggesting a total number of **25 underweight individuals** while **39 of the total participants** perceive themselves as members of the above mentioned category.

Discussions

A study based on the body mass index , obesity and the perception of the body image has revealed a series of differences, gender-related. The girls have shown higher values on the body mass index than the boys (Coelho et al., 2013). In our study, several girls appear with values of the body mass index which place them in the category of underweight people.

Nowadays, the ideal of body aspect puts a lot of pressure on young people who mostly participate in fitness activities or other physical activities to attain this ideal. Teenagers can face body mass index disorders, these being registered especially among girls (Grenhill, 2003; Harvey, Robinson, 2003, apud Burlew and Shurts, 2013). People with body mass index disorders undergo a series of behavioural and cognitive changes which often lead to depression, low self-esteem and even suicide (Kimmel şi Mahalik, 2004; Raevuori et al., 2008; Wade, George, Atkinson, 2009, apud Burlew and Shurts, 2013).

Regarding the body mass index, our study has shown a remarkable difference. The p-Value in the Chi-Square test was p= 0.00. Several girls, namely 13.53% have been catalogued as underweight based on the proportion between height and weight, whereas only 1.18% of the boys have been grouped under the same category (chart no. 2).

Under the item which brings into discussion the concern with the body shape, how tall or short the individuals are, how underweight or overweight they are, upon performing the Chi-Square test, the p-Value was p= 0.01, revealing that the gender difference is significant. A percentage of 12.28% of the girls are often preoccupied with the way in which they look, as opposed to only 6.43% of the boys who chose the same answer (chart no. 6).

The Chi-Square test has also pointed out a significant gender-based difference in the item concerning the choice of specific clothing, the p-Value being p= 0.00. A percentage of 40.94% of the boys have declared that they have never put on specific clothes to hide certain imperfections of the body, whereas only 22.8% of the girls have declared not ever using this trick (chart no. 7).

A significant difference between boys and girls, with the p-Value p= 0.006 was recorded on the item regarding the link between a hyper caloric diet and the concern towards the body image. A percentage of 25.15% of the boys have never been preoccupied with the fact that a hyper caloric diet could influence their body image, whereas only 15.2% of the girls said the same thing (chart no. 8).

For the question regarding the dissatisfaction in relation to their own body, the p-Value p= 0.00 shows a significant difference between boys and girls. Only 8.19% of the girls have declared that they never feel ashamed of their body, while 28.07% of the boys have said the same (chart no. 9).

The p-Value p= 0.03 as a result of the Chi-Square test indicates a remarkable difference between boys and girls in what concerns the answer to whether they have taken up a diet to maintain or improve their body image. A percentage of 36.84% of the boys have never done this, while 21.64% of the girls have said the same thing (chart no. 10).

A significant difference p= 0.026 between boys and girls was revealed in the item regarding the respondents' desire to change something from their own body. A percentage of 13.45% of the boys declared they would very rarely do this, while only 4.68% can say the same (chart no. 11).

The p-Value p= 0.023 shows a meaningful difference between boys and girls regarding how often they compare themselves from a body image point of view with those around them. A percentage of 12.94% of the girls stated that they often compare themselves with those around them, whereas only 5.88% of the boys said the same (chart no. 13).

Another important difference between boys and girls appears in relation to the participation in various physical activities, the p-Value being p= 0.00. A percentage of 41.76% of the boys claimed that they take part in physical/sports activities, while only 21.76% of the girls can say the same (chart no. 14).

The item which asked the respondents to identify themselves with a series of images, starting from underweight, normal weight, overweight and obese did not register a significant difference, the p-Value being p= 0.43. A percentage of 32.35% of the girls have identified themselves with the correct image of the normal weight group. The same happened with a percentage of 34.71% of the boys (chart no. 15).

When asked about the way in which they believe to be perceived by the others, starting from the same images mentioned above, the individuals did not show a significant difference in answers, the p-Value being p= 0.47. The large majority, 34.12% of the boys and 31.76% of the girls have declared that they are seen by those around them as being part of the normal weight group (chart no. 16).

Conclusions

The body mass index influences to a large extent the accuracy of the body image of individuals, although some have the tendency to perceive themselves as being part of a superior category as opposed to that indicated by the values of the body mass index. The individuals that are overweight tend to see themselves as being of normal weight. Girls in general identify themselves with the image of underweight, even though their body mass index would classify them as normal weight individuals.

A high percentage of girls, 13.53% are catalogued as being underweight, probably due to the diets they follow to make sure they do not overcome the weight corresponding to their age and height.

The girls who participated in the study are far more preoccupied with the way the look than the boys, as they are also paying attention to what they can wear to hide certain imperfections. From the analysis of data, we gather that girls are more ashamed of their own bodies than the boys.

In what concerns taking up a diet to appear fit in front on the others, results have shown that the girls have adopted such a diet with a higher frequency.

The girls declared they would change more often something about their own bodies, while the boys are less preoccupied with this aspect.

The boys do not compare themselves at a body image level as often as girls do with those around them.

Taking part in sports activities is far more restricted among the girls than among the boys. There are no significant differences from those declared by the respondents between the way in which they perceive themselves and in the way in which they are seen by those around them.

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OPINION STUDY OF ROMANIAN COACH THE EMOTIONAL INTELLIGENCE IN GYMNASTICS TRAINING AND COMPETITION

RAMONA ANCUŢA NUŢ[1]

ABSTRACT. I decided to conduct a study on familiarity ascertaining coaches or specialists in artistic gymnastics athletes with sport psychology, sport psychological training on aspects of emotional intelligence, if they have a program in his team's emotional development and the psychological training programs applied during training or competitions.

Key words: sport psychology, emotional development, emotional intelligence

REZUMAT. Studiu privind opinia antrenorilor români asupra inteligenţei emoţionale în antrenament şi competiţii în gimnastica artistică. Mi-am propus să elaborez un studiu constatativ privind familiarizarea antrenorilor sau specialiştilor sportivi din gimnastica artistică cu psihologia sportului, pregătirea psihologică în sport privind aspecte ale inteligenţei emoţionale, dacă beneficiază de un program de dezvoltare emoţională în cadrul echipei sale şi ce programe de pregătire psihologică aplică în timpul antrenamentelor sau competiţiilor.

Cuvinte cheie: psihologia sportului, dezvoltare emoţională, inteligenţă emoţională

In this study I decided to conduct a study on familiarity ascertaining coaches or specialists in artistic gymnastics athletes with sport psychology, sport psychological training on aspects of emotional intelligence, if they have a program in his team's emotional development and the psychological training programs applied during training or competitions.

Study objectives

This experiment was investigated as follows:

- level of specialist knowledge about mental preparation of athletes;
- if they have emotional development program within his team

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- the psychological and emotional development training programs applied in the training or competitions
- efficiency programs highlighting the emotional development of the gymnasts in sports training and ways to improve their
- addressing psychological preparation and lesson share in training

Conducting a survey aimed at assessing the place and role emotional development in sports training gymnasts and correlation of this component with other components of training. Thus, the results obtained by applying questionnaires highlighted the need to pay particular attention to emotional development gymnasts.

Method

Optimization strategies mental programs have theoretical and practical implications of scientific sports training. Thus, making a significant contribution in the development of instructional strategies for the emotional development of athletes in relation to other components of training, can provide an increase in athletic performance. The first step was the acquisition and adaptation of a questionnaire for gymnasts. The survey questionnaire was taken from the Romanian coaches opinion about the psychological factor of training (Sava, M., A., 2013), entitled "Psychological preparation in training and competitions in judo athletes."

Subjects

The measuring instrument is addressed to specialists in artistic gymnastics. The questionnaire was distributed to coaches, teachers and choreographers in artistic gymnastics in number 76, who come from various clubs in the country. By using survey questionnaire-based method have achieved a great deal of information on experts' opinions regarding the psychological preparation approach on the development of emotional intelligence in sports training.

Instruments

A questionnaire was used (Sava, M., A., 2013), which included descriptive data about respondents (demographics, age, gender, length of service in the field, professional ranks.) And items to investigate issues preparation of psychological and emotional development. (See Annex 8)

Procedure

Individuals were contacted through various ways and in various places (competitions, training courses, conferences, on-line).

Questionnaires were offered for completing the A4 envelope so that submissions remain confidential and at the same time facilitate the collection of questionnaires. The questionnaires were applied individually, without time limit.

Results

Data were processed with SPSS 18 (Statistical Package for the Social Sciences).

Following the centralization of data obtained through the questionnaire will present an analysis of the results on each item, using the graphic method.

1. Are you familiar with the term emotional development in sport?

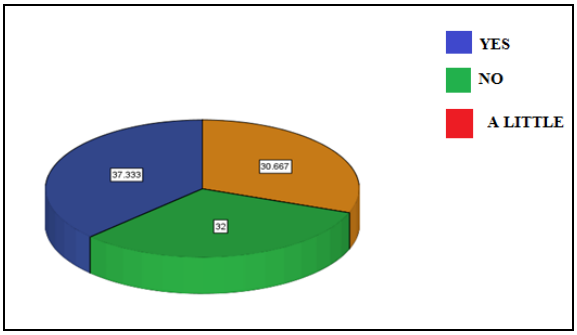

Figure 1. Familiarity with the term emotional development

Responses to the item that asked subjects indicating familiarity with the term emotional development have been formed, as illustrated in the chart above: 37% say they are familiar, 32% and 30% admit they do not say that least.

2. Attach importance to emotional development of athletes in your work?

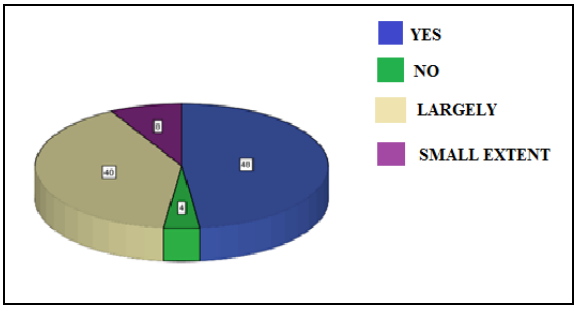

Figure 2. The importance of emotional development in sport performance

This question percentages are close to those who say yes or substantively as follows: 48% say yes and 40% say largely, however those who say little to be 8% and those who are not considered 4%.

3. What is the level of implementation of development programs in training or competitions emotional in our country?

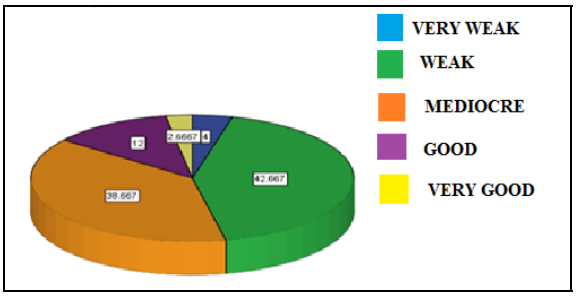

Figure 3. The application of emotional development programs

The answers to this question are interesting. Thus we see that a large percentage of specialists consider that the application of emotional development programs is poor, 43% and 38% think it is mediocre, which indicates that the best programs are not implemented. Other specialists in percentage 12% think the Good, 4% say it is very weak and only 3% think it is very good.

4. Have you ever participated in information sessions and training in emotional development techniques?

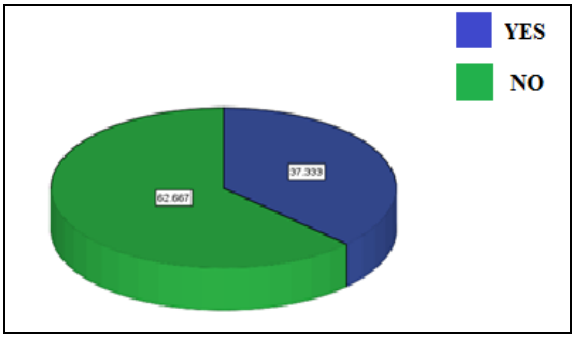

Figure 4. Participation in the program in terms of emotional development

As you follow the dynamics of responses to questions in the questionnaire before our looming increasingly clear application development stage and emotional development programs in artistic gymnastics in the country.

To this question the percentages are 63% for those who say they have not participated in trainings emotional development, however 37% say yes. That means the need for more information on these programs and their implementation in preparation coaches.

5. Do you think the emotional impact performance training of athletes in gymnastics competitions?

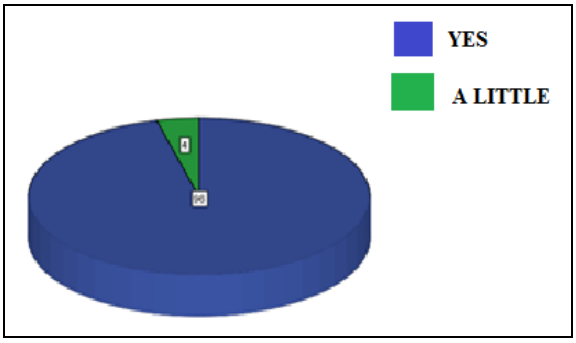

Figure 5. Influence on the performance of emotional development

Responses to the question which subjects are asked to indicate the influence emotional development of sports in artistic gymnastics performance shows that 96% of experts believe that emotional development has a very important role in obtaining performance, but only 4% believe the least. This means that the emotional preparation of athletes is regarded as an important factor in getting sports performance.

6. What place does psychological preparation in the preparation of your team?

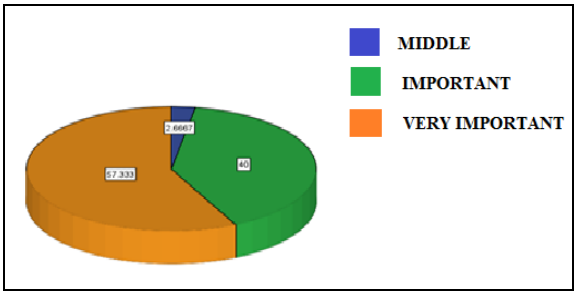

Figure 6. Place of psychological preparation in the training

Place of psychological preparation training is considered as very important by 57% of those surveyed, 40% say important and environmental specialists say 3% of subjects. It is surprising that specialists take time from their schedule to prepare for psychological preparation.

7. What do you think are the most important qualities of a psychic / a gymnast / s?

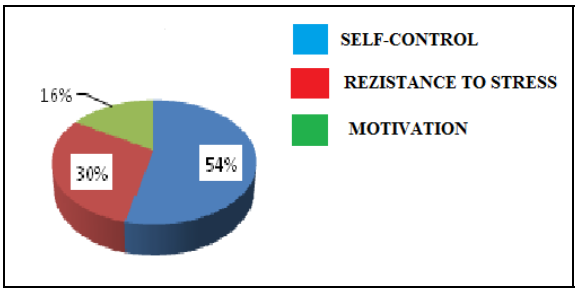

Figure 7. Mental qualities of gymnasts

From the figure above that Romanian experts believe the most important artistic gymnastics mental qualities that you must possess a gymnast is 54% self-control, stress resistance 30% and 16% motivation. Other subjects mentioned mental qualities in order of importance are: will, perseverance, courage, fortitude.

8. Do you think you can manage emotional methodological training your athletes training and competition, with a program of emotional development?

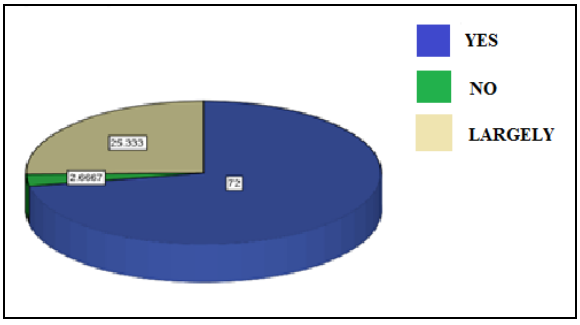

Figure 8. The power required to conduct psychological preparation

The analysis of this question shows that 72% of the specialists that because of their experience with a tracksuit and emotional development could prepare themselves in terms of emotional development athletes. 25% of those surveyed believe that they largely succeed, and 3% do not have confidence and say no.

9. What are the methods and techniques we use emotional development of athletes in your team? List the most important ones in your opinion

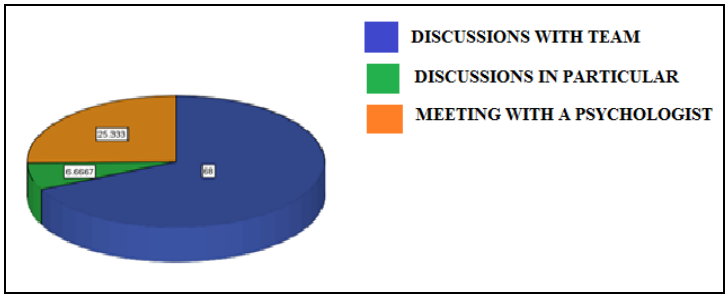

Figure 9. The methods and techniques used in the emotional

To this question 68% of subjects used and considered the most important as the method of emotional development, team discussions. 25% of experts believe that discussions are particularly important as the application method and 7% believe that it is important to meet with a psychologist.

10. How do you react when a / an athlete / she whose mental capacity is diminished?

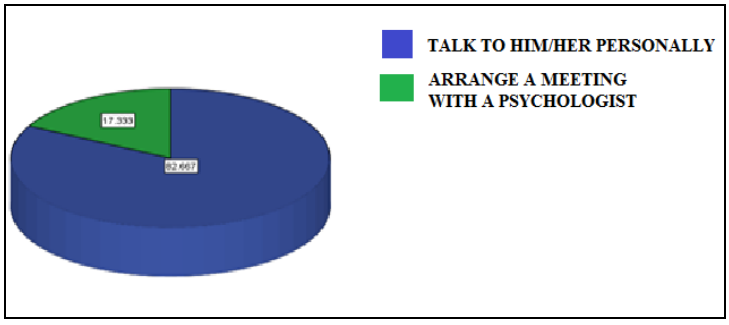

Figure 10. Coach reaction in certain limited circumstances

Through this analysis, 83% of staff specialists discuss sports, which appears to resolve personal trainer availability situation no calling a psychologist and 17% of respondents require a psychologist. It is observed that no topic has not let the issue go away, neglecting state athletes.

11. Who do you think should discuss the problems that sports mind?

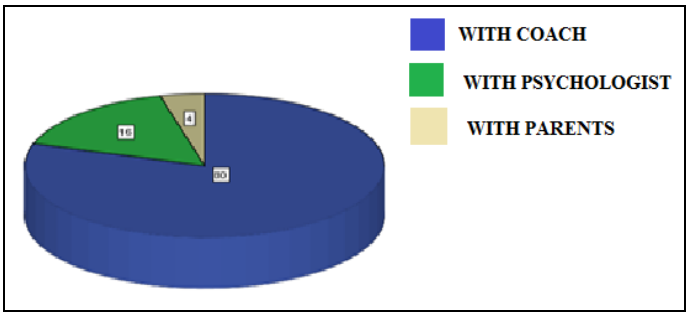

Figure 11. Establishing person to discuss athletes

To this question 80% of those surveyed believe that the coach is the best person to solve problems in athletes, 16% and 4% believe that parents psychologist who could solve their children's problems. Through this analysis concludes that the coach believes that in addition to physical and technical preparation of athletes can take place and a psychologist.

12. Did you implement a strategy to improve the emotional state of the athletes / sportsmen could affect your team's performance?

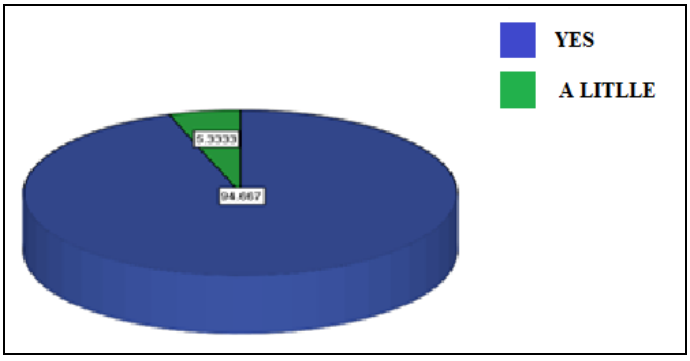

Figure 12. The influence of emotional development strategy on sports performance

To this question 95% of those surveyed believe that the implementation of strategies to improve mood can improve the performance of their team and only 5% think less. This forces us to pay more attention to these strategies, by making emotional development programs and their application in practice. Gratifying is that no coach did not consider strategies for improving mood can affect sports performance.

13. Formulate the most important objective should be to have this strategy in your opinion

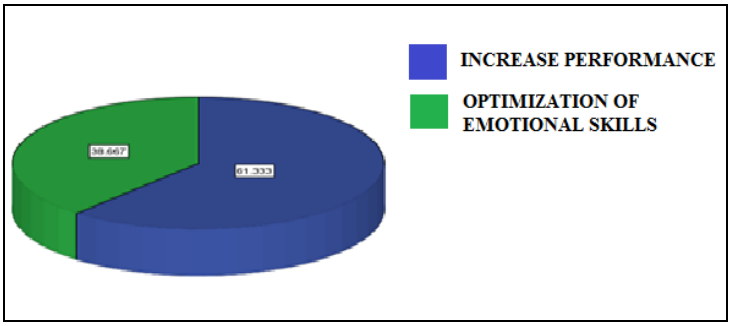

Figure 13. Objective optimization strategy emotional development

From data analysis notes that 61% of the specialists see as main objective the increase sports performance and 39% of them indicated that secondary objective optimization and emotional skills.

Discussions

Data from the analysis of the questionnaire addressed to specialists in artistic gymnastics shows that the process of preparing for the emotional development is still in its infancy and requires greater attention and involvement from those in the gym.

Our main objective was to find the need to develop emotional intelligence and emotional development of application programs in preparing athletes to improve sports performance. To this end we analyzed the opinion of specialists noting the urgent need to optimize the emotional development programs and their inclusion in the program of psychological training.

However, the specific issue of developing emotional intelligence is largely unknown and that importance is given to training athletes. The application of emotional development programs, unfortunately is small, probably in the absence of these specialized programs and sports industries due to poor participation of specialists in information sessions and training in emotional development techniques.

Gratifying is that coaches attached great importance to the training and psychological preparation in a largely considers the development of emotional intelligence influences athletic performance in training and competition.

It was also found in the data from the questionnaire that coaches have listed a gymnast important psychological quality that is important psychological factors in the development of emotional intelligence.

Due to changes in the practical requirements (code points) that are becoming increasingly difficult to achieve as an athlete and coach, coaches, and having more responsibilities, required the need to work more closely with psychologists to facilitate the proper training of athletes, both physically and emotionally.

Appreciated is that, based on these results, the coaches are willing to implement a training plan athlete's emotional development strategy and believes that these strategies can influence sports performance.

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BASIC POINTS OF VIEW ABOUT THE PREPARATION FOR 50M, 100M, 200M BREAST–STROKE OF THE STUDENTS FROM THE "BABES-BOLYAI" UNIVERSITY

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ABSTRACT. This scientific article presents the preparation for 50 m, 100 m, 200 m breast–stroke event of the students from the "Babes-Bolyai" University. This research started in January 2011 with a group of 20 people. The purpose of it was to improve the interim conclusion. This is the reason why we used a specific training method, in which we wanted to improve the extant swimming techniques with dry-land and aquatic power exercises. The purpose of the power exercises to intensify the speed, power and endurance. The main objective would help the swimmers results with this unique training program. This is the reason why our objective is about the correction, development and improvement of breast-stroke swimming techniques of those students who had learnt this swimming style. As you all know the desired results can be achieved if the swimmer has the appropriate breast-swimming techniques. The deduction is the following: through the correction of dry-land and aquatic breast-swimming techniques, the swimmer's capacity can be improved (in time)! This means that the used training program has a positive impact on the swimmers' results at 50, 100 and 200m distance.

Keywords: breast-stroke; The methods, principles and particularity/nature of training; The types of training program; Dry-land power exercises; Aquatic exercises

REZUMAT. Studiu cu privire la pregătirea fizică a studenţilor de la Universitatea "Babeş-Bolyai" la probele de 50m, 100m, 200m bras. Articol ştiinţific prezintă pregătirea pentru 50m, 100m, 200m bras a studenţilor de la Universitatea "Babeş-Bolyai". Aceasta cercetare a început în ianuarie 2011 cu un grup de 20 de persoane. Scopul a fost de a îmbunătăţi concluzie intermediară. Acesta este motivul pentru care am folosit o metodă de formare specifică, în care ne-am dorit să se îmbunătăţească tehnicile de înot existente cu exerciţii de forţa sec-terestre şi acvatice. Scopul: efectuarea exerciţiilor pentru a intensifica viteza, puterea si rezistenta. Principalul obiectiv ar ajuta rezultatele înotători

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cu acest program de formare unic. Acesta este motivul pentru care obiectivul nostru este despre corectarea, dezvoltarea şi perfecţionarea tehnicilor de înot la studenţi care au învăţat acest stil de înot. După cum ştiţi rezultatele dorite pot fi atinse în cazul în care înotătorul are tehnici de bras adecvate. Deducerea este următoarea: prin corectarea tehnicilor de bras cu exerciţii uscat-terestre şi acvatice, capacitatea înotătorului poate fi îmbunătăţit (în timp)! Acest lucru înseamnă că programul de formare folosit are un impact pozitiv asupra rezultatelor de înotători "la 50, 100 şi 200 m distanţă.

Cuvinte cheie: accident vascular cerebral, metodele, principiile și particularitate/ natura formării, tipul de programe de formare; Antrenament de forţă pe uscat; exerciţii acvatice

Introduction

If a person trains (or passes effort), can get in “good condition”. The training exercises have certain stress impact on the body which by changing oneself can get used to this influence/impact for fighting this unique stress. This stress is not the match for strictly speaking stress**.** In this case the stress factor is a long-run or a multiple training method. These are physiological changes that can make the human organism capable for a more efficient work. If somebody swims at long-runs the effectiveness of heart function takes up and can pump more blood into the muscles. This blood transports oxygen and glycogen to the muscles and removes fatigue and during the process can ameliorate the stamina. The stress impact result or adapting to the heart-function efficiency and the impact on the persons performance is the following: the endurance raises. The fact that the body responds to special training programs with special adapting or changes it is called training features. This is an important fact and it should be clear while training program is planned. If somebody wants to sprint good (50 meters competitions) or wants to be a good middle-distance swimmer (200 or 400 meters competitions) and wants to be a distance swimmer as well (over 400 meters) should apply the three above mention training method. Even though the training impact can be transported from one training method to another, the measure of transport depends on similar training methods. For example the swimmer, who practices multiple training, it may be possible that he/she would be capable for a faster sprint, but he/she won’t be as fast as those people who trained with sprint training or certain middle-distance training methods. It is obvious that a distance-swimmer should put energy into different methods as a sprinter.

Actually the swimmers (especially those who belong to one age group) can start in several competitions, with a distance of 50 or 200 meters. For the age group members the programs should have little differences. Both need middle-distance training as well because this secures better resistance for sprinter swimmers, who shall swim faster 100 meters distance, respectively speed for distance swimmer to be faster at a 400 meters distance.
By planning the training program we should answer the following questions:

1. How much do we swim a day 4500, 9000, 12000 or 18000 meters?
2. How often do we train a day? Once, twice or more?
3. How strong do we swim? Are we swimming with power all the time or do we add easy swimming too?
4. How many months should be spent with training? Three months? Ten months? The whole year?
5. Which training method should be emphasized? Sprint training, tempo training, middle distance training

There is no specific answer. The answers depend on factors like how much time do we have in a swimming-bath, how good swimmer wants the person to be, how much time and energy can he/she spent on swimming.
Types of training program:

a) Tempo training training method: the tempo training training means the uninterrupted swimming of longer distances (400 meters, 1500 meters etc.). 70-09% from this method is aerob work and the other 30-5% is anaerob. The advantage of this method is important because the heart should give a lot of oxygen for the organism.
b) **Staged training method**: in this method the body is forced by regular submaximal exercises training set in which there are introduced several relaxing periods. The relaxing periods are usually short that make a partial relaxing possible. This doesn't allow the body to have a full break after it got exhausted. A well-known staged training method is for example: 15x100 meters with 10 s relaxing after 100 meters.
c) **Repeated training method**: in this training method the body is forced to use its strength maximally or almost maximally effort. This is mixed with overseen relaxing periods**.** During this training method the body can relax after a series of exercises.
d) **Fartlek training method:** this training method is very close to the staged one. In this method the swimmer should swim without any interruption, from slow changes his/her speed to fast etc**.** A specific training that is often called pyramid-training, can be the following: 1 **distance/pool soft (100 m soft)**, 100 m hard. There is another method within this one: 2 distance soft, 1 hard distance repeated until the person reaches 1000 meters.

e) **Sprint training method:** this training method is for 50 meters, in which the swimmer sprints short distances in full fling. The sprint method means a stress fact, in which the stress is short, but much more intensive than long distanced-swimming. During this method the muscles can become stronger. Aerob/anaerob work: 15% aerob, 85% anaerob.
f) **Hypoxical training method:** during this method the swimmer counts the speed of his/her breathing and breaths less than usually. This helps create more oxygen by low work. With overseen respiration the oxygen transmitted to the cells is decreased. In case we swim permanently within hypoxical circumstances, the oxygen score and blood lactate, and the level of concentration of lactic acid in the muscles is higher than in any other training method with normal respiration. (James E. Counsilman., 1982)

Research methods

From the swimming method the breast-stroke swimming is the hardest to learn. The arm- and foot-work is performed sideward, not in fore and aft style. The coordination of arm- and foot-work intensifies the difficulty because of proper overlap of arm- and foot-work. This is the reason why we start the teaching with freestyle, back-stroke and after that comes the breast-stroke. However the breast-stroke style is prevailing. This justifies the fact that the correct leg movement causes difficulties, but the arm-movement and breathing is remarkably easy. Half of the head is under the water, so the swimmer can have a great sense of locality. In case of good sense of locality the safety of the swimmer increases in the water. By the execution of breast-stroke style if the movements are not correct the person can swim with less use of energy. A lifeguard who supervises the safety and rescue of swimmers uses the breast-stroke swim style. Because of this positive feature those who want to learn just one swim style they will definitely learn this one. But what happens in the case when somebody already knows how to swim and has his/her own swimming technique? Is this technique correct? What if this cannot be improved? What kind of method is sufficient and how much time do we need? These were question that made me curious during my research paper.

In my work I made a research on a group of 20 persons for 6 months, students from the “Babes-Bolyai” University, 12 boys and 6 girls. The swimmers were between the ages 20-22. Each person the group had training twice a week, all persons had the same training method. The main purpose was the improvement of part-time with dry-land and aquatic power exercises. The trainings were held in the swimming-pool and fitness studio. We started the training after the winter holiday in January. The measured times are presented in the following table:

Table1.

Shows the results from January 2011

Number	Name	Time (min:s:hundred second)		
Girls		**200 M**	**100 m**	**50 M**
1	B. B.	5:01:00	2:25:07	1:01:00
2	B. H.	3:57:00	1:57:00	0:51:02
3	C. A.	4:25:00	2:08:00	1:00:10
4	D. CS.	4:56:26	2:24:00	0:59:03
5	G. P.	4:29:52	2:14:00	0:59:11
6	O. M.	4:08:11	2:27:22	1:00:10
7	SZ. E.	4:17:30	1:59:30	0:58:43
8	SZ. M.	4:25:38	2:09:10	0:57:30
Average:		**4:27:35**	**2:13:01**	**0:58:21**
Boys		**200 M**	**100 m**	**50 M**
9	B. L.	4:37:50	2:00:23	0:54:01
10	C. C.	3:45:00	1:47:00	0:44:08
11	F. A.	4:51:08	2:17:00	0:59:40
12	H. A.	4:58:00	2:25:00	1:06:07
13	K. K.	3:51:42	1:52:00	0:49:30
14	K. T.	4:38:00	2:12:00	0:59:20
15	M. A.	3:55:11	1:49:00	0:44:32
16	M. L.	4:13:00	1:58:30	0:50:18
17	N. L.	3:49:00	1:57:00	0:56:00
18	SZ. H.	4:08:28	1:54:29	0:51:59
19	T. Z.	3:51:14	1:49:55	0:44:53
20	T. ZS.	4:15:00	2:01:00	0:54:03
Average:		**4:14:28**	**2:00:16**	**0:52:53**
Total average:		**4:19:43**	**2:05:22**	**0:55:04**

It is obvious that the boys had better results than the girls.

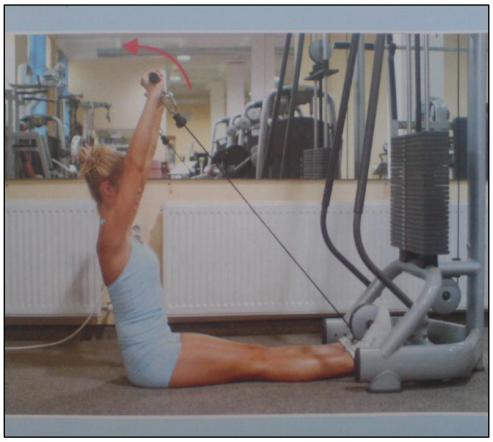
The question: with which member should we start the teaching of breast-stroke swimming is nowadays still discussed. The execution of the foot-work is hard so its learning and improvement takes up a lot of time. The priority of arm work is the ease of learning, and even if this is not used correctly can lead to improvement where as this by foot-work is not possible. Substantially the order is not as important as by the other three swim styles. After learning the gliding the swimming movements should be in the following line: arm-work, foot-work, phasing arm- and footwork and breathing. Within every method there are dry-land and aquatic exercises.

In the following two sub-chapters I will present dry-land and aquatic power exercises I used during my training.

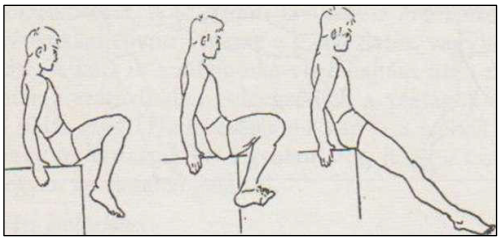
a. Dry-land exercises

1. In this chapter different power exercises will be presented in order to understand better the method which helps to improve the swimmers performance.

These exercises are accomplished on dry-land by the individuals. The purpose of the power exercises is to improve speed, strength and resistance. It is very important to plan the exercises carefully. Within the dry-land power exercises there are arm-generating exercises that include triceps muscles, and arm rotators muscles.

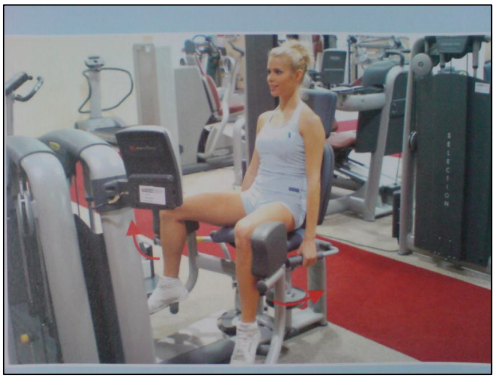


1. Exercises for shoulder girdle

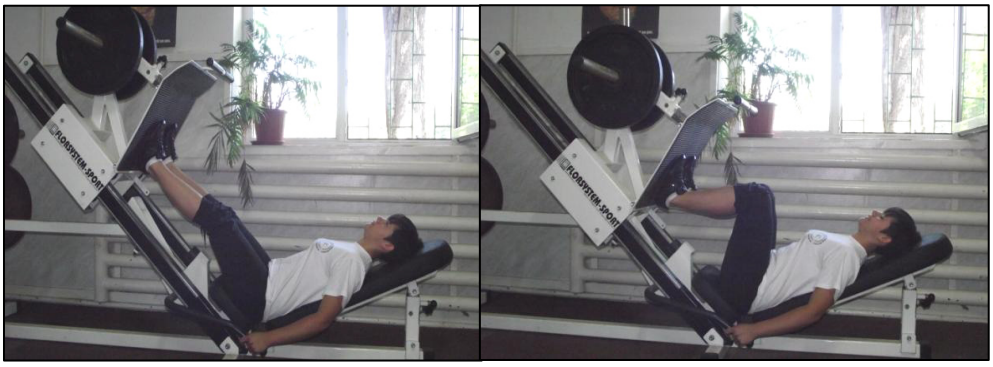


2. Illustration: Foot-work in L seat

Strengthening of the adductor -longus, -magnus and -brevis muscles, bender exercises for knee joint muscles, stretching exercises for knee joint muscles, expressing with legs.



3. llustration: Strengthening of limb muscles



4. Illustration: Expressing with legs

5. Illustration: Leg flexing with dumbbell

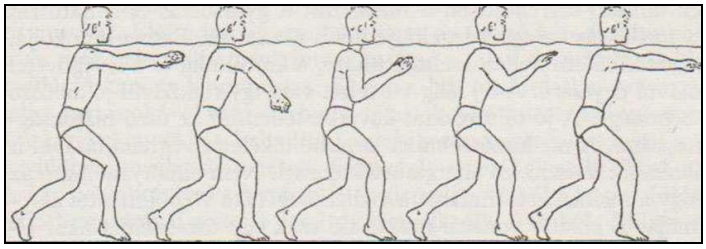
Aquatic exercises

In this chapter I present different aquatic power exercises. Speed, power, performance and the improvement of resistance are the purpose of the aquatic exercises. By these exercises the students are faced with the resistance of the water. This is the reason why we used not weights but only few tools: kickboard**,** ball, elastic band. I divided the aquatic exercises into three: arm-improved, foot improved exercises, start and round improver exercises. Just because the foot- and arm-work is executed under the water the coach, helper aid must be attentive not to mess up but to improve the technique.

a) Arm-developer exercises: in the breast-stroke swimming

The arm-work fully is executed under the water it is shorter because the pushing phase is missing. The exercises are built up on these levels:

1. Arm-work exercises while standing

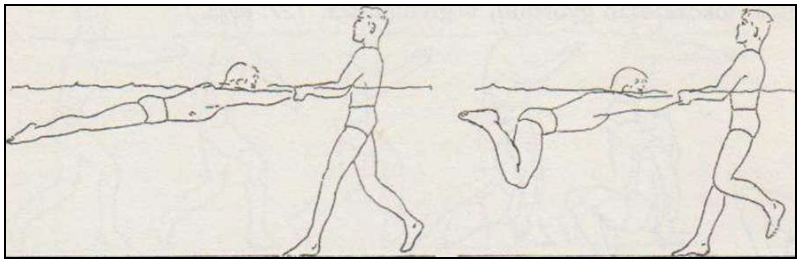


6. Illustration: arm-work in the water

2. Slow walking arm-work
3. Arm – work during gliding
4. Lying in deep water, feet in the "wave catcher", breast-stokre arm work
5. Getting away from the wall, with bouy/ kickboard between the legs, during the gliding arm-work should be exercised
6. Lying on the stomach on a tool (foot-stool**),** so that the point of support is by the sciatic, arm-work should imitate breast-stroke style.
7. Getting away from the wall with drawling legs: 4-5 doing arm-work without breathing. The flexure of the elbow should be correct the pulling phase should not pass the line of the shoulders.

b) Foot-work exercises: the whole foot-work is under the water. It has two important movements: the priming and astern kicking motion

1. Foot-work by the rim of the swimming-pool
2. Foot-work by gliding



7. Illustration: foot-work by gliding

3. Getting away From the wall with kick board breast-stroke foot-work exercise
4. Lying on the stomach, parallel with the rim of the pool, doing arm-work on one side.
5. Exercising the foot-work with kick board: the swimmer's drawling elbow should lean upon the kick board, after each movement a short period comes with closed legs until the exhaling.
6. Breast-stroke foot-work on back: the arms are beneath the body by the first exercise, in the next in high keeping.

Results

According to the above mentioned exercises, I measured the students again in June. The following table presents the results and the differences between the two measuring.

Table 2.

Results from June 2011

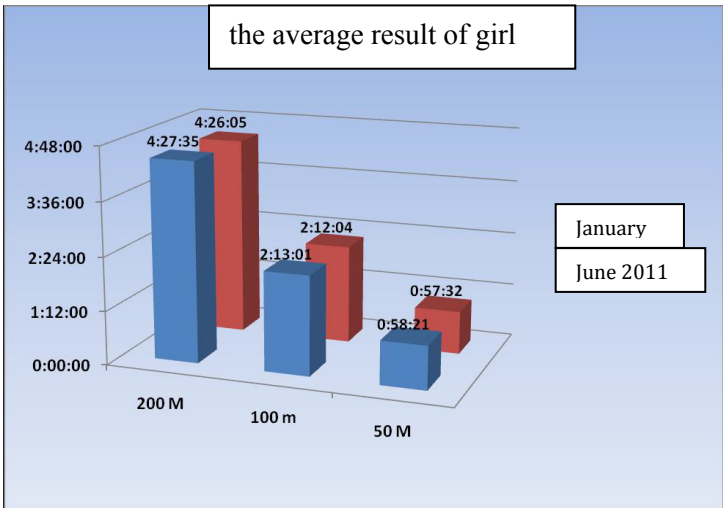
Number		**Name**				**Time (min:s:hundred second)**	
Girls		**200 M**		**100 m**		**50 M**	
1	B. B.	4:57:30	0:03:30	2:23:00	0:02:07	1:00:22	0:00:38
2	B. H.	3:56:19	0:00:41	1:56:43	0:00:17	0:50:13	0:00:49
3	C. A.	4:23:52	0:01:08	2:07:27	0:00:33	0:59:49	0:00:21
4	D. CS.	4:55:00	0:01:26	2:23:55	0:00:05	0:58:22	0:00:41
5	G. P.	4:26:34	0:03:18	2:13:05	0:00:55	0:57:32	0:01:39
6	O. M.	4:08:11	0:00:00	2:27:00	0:00:22	0:59:10	0:01:00
7	SZ. E.	4:16:34	0:00:56	1:57:00	0:02:30	0:58:00	0:00:43
8	SZ. M.	4:24:42	0:00:56	2:08:20	0:00:50	0:56:49	0:00:41
Average:	**4:26:05**	**0:01:29**		**2:12:04**	**0:00:57**	**0:57:32**	**0:00:49**
Boys		**200 M**		**100 m**		**50 M**	
9	B. L.	4:35:20	0:02:30	1:59:22	0:01:01	0:52:38	0:01:23
10	C. C.	3:43:17	0:01:43	1:46:14	0:00:46	0:43:28	0:00:40
11	F. A.	4:48:23	0:02:45	2:16:05	0:00:55	0:59:20	0:00:20
12	H. A.	4:55:31	0:02:29	2:25:00	0:00:00	1:05:00	0:01:07
13	K. K.	3:47:20	0:04:22	1:50:11	0:01:49	0:48:50	0:00:40
14	K. T.	4:37:13	0:00:47	2:10:05	0:01:55	0:59:20	0:00:00
15	M. A.	3:54:06	0:01:05	1:48:17	0:00:43	0:44:05	0:00:27
16	M. L.	4:10:56	0:02:04	1:56:22	0:02:08	0:48:20	0:01:58
17	N. L.	3:47:17	0:01:43	1:56:07	0:00:53	0:55:10	0:00:50
18	SZ. H.	4:06:08	0:02:20	1:52:11	0:02:18	0:50:03	0:01:56
19	T. Z.	3:48:52	0:02:22	1:48:20	0:01:35	0:44:14	0:00:39
20	T. ZS.	4:13:20	0:01:40	2:00:01	0:00:59	0:53:32	0:00:31
Average:	**4:12:19**	**0:02:09**		**1:59:01**	**0:01:15**	**0:52:00**	**0:00:53**
Total average:	**4:17:49**	**0:01:53**		**2:04:14**	**0:01:08**	**0:54:13**	**0:00:51**

After 6 months the results show that the boys and girls have improved. (Major L., 2011)

Discussions and conclusions

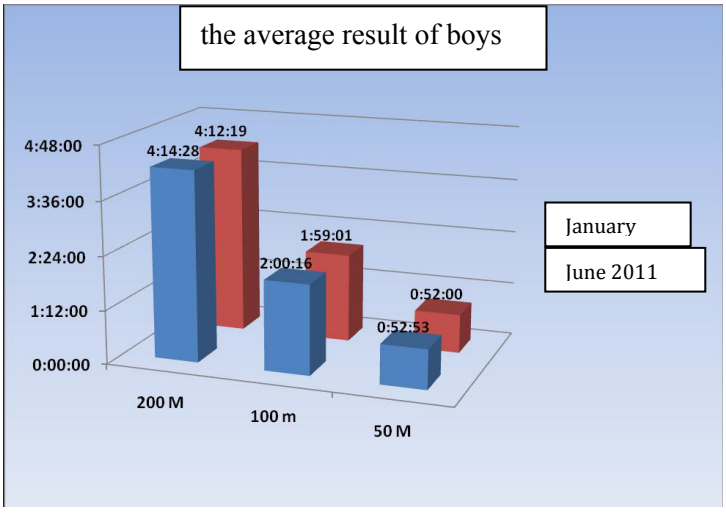
The aim was that with the help of the training program we should ameliorate the swimmers results/interim conclusions. The deduction is the following: through the correction of dry-land and aquatic breast-swimming techniques, the swimmer's capacity can be improved (in time)! This means that the used training program has a positive impact on the swimmers' results at 50, 100 and 200m distance. The before mentioned results confirm the assumption and prove the hypothesis.

This diagram presents the average result of girl from January to June.



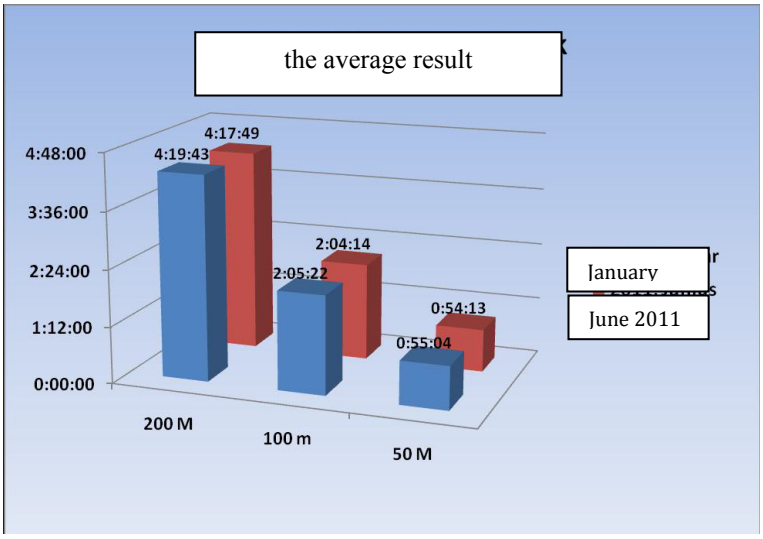
Graph 1. The girls average results

Following diagram presents the averaging conclusion of the boys



Graph 2. The boys average results

The following diagram shows the changes of the average results



Graph 3. Total average

The graphics support the assumption that the use of the training program the time at 50, 100 and 200 meters distance can be improved by breast-stroke swimmers. The exercises develop the swimming techniques. With the help of swimming techniques we ameliorated the results. The hypothesis was correct there have been several outstanding time changes thanks to a half-year training program. (Major L., 2011)

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STUDY REGARDING AN AMATEUR WATER POLO TEAM

RADU SABĂU[1] & ISTVÁN BALOGA[2]

ABSTRACT. The current study has been dedicated to present some particular characteristics of an amateur water polo team. Training patterns and other factors that influence a team's performance as well as organizational features are emphasized along this study.

Key words: Water polo team, practice, organizational system, management, competition**.**

REZUMAT. Studiu privind o echipă de amatori la polo pe apă. Lucrarea de faţă se referă la prezentarea caracteristicilor unei echipe de polo pe apă la nivel de amatori. Diferite sisteme de organizare competiţională, metode de antrenament precum şi factori care influenţează performanţa sportivă sunt prezentate dealungul acestui studiu.

Cuvinte cheie: Echipă de polo pe apă, antrenament, sistem organizaţional, management, competiţie**.**

Introduction

Water polo is a sport characterized by complex physical activity, involving absolutely all muscle groups, while overcoming resistance from a different environment people live their lives. From a physiological point of view, water polo can fit in the group of sports characterized with a mixed aerobic-anaerobic and predominantly aerobic effort. Water polo is diverse in terms of physical qualities and performance factors, namely an endurance-strength regime, speed, technique, conditions of physical contact and mental tension (Sabău, 2010).

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Water polo is an unusual sport also because it takes place in an aquatic environment. Therefore it is considered that water polo players must be able to swim all competitive strokes, in addition to the specific swimming techniques used in water polo. This provides a solid basis in which athletes can successfully perform their technical and tactical elements of the game. The rapidity of actions with or without the ball in offense and defense would not be possible without a high volume of swimming training. A good knowledge of the regular and particular to water polo swimming techniques will facilitate to learn ball handling techniques and will ensure the individual and collective tactics in a modern and creative manner (Marinescu, 2000).

Characteristics of an amateur water polo team

This study refers to "Politehnica" water polo team from Cluj, a team participating in the Romanian National League of water polo. It was considered useful to develop such a study to describe the condition of water polo teams at an amateur level, participating in a league with mostly professional or semi-professional teams. A major difference between professional and amateur teams is primarily the number of hours (weekly or monthly) dedicated to practices. Other factors that directly influence results are: the value of athletes, staff and department budget, and team management. Regardless of methods and exercises used, it is impossible to reach optimal parameters for training in the condition of halved preparation time comparing to the other competing teams in the National Championship.

Taking into consideration the complexity and diversity of the effort in athletic performance, it is necessary to plan the training through specific objectives, based on precise and comparable indicators.

Sport training is the primary way to prepare athletes for competitions by increasing motor skills in order to achieve performance (Epuran, 2001).
Nowadays workouts are characterized by a higher intensity and complexity compared to the ones of the later decades. Changes in rules that were brought over the years aimed to turn the game into a more spectacular one, by increasing the speed of the game but also having a decisive impact over the training process. The result is a more dynamic and more physically demanding game of water polo, leading to a more rigorous training but also to the need of having the teams' "bench" to a closer value to the starting players.

Right now, players have only 30 seconds (in most cases) to swim down the pool, set up the offense and score. They will spend approximately 15-20 seconds getting down to the other end of the pool depending on the age and

level of play and then they are left with 10-15 seconds to organize the offense. In basketball, players run the similar distance (compared to the water polo court) which leaves them with 25 seconds to set up the offense (Ivovic, 2012).

Through the decisions of the Romanian Water Polo Federation, there have been different forms of organization of the National Championship. The most commonly used consists of a regular season with double weekly games followed by the playoffs. Usually the National Championship begins in late September or early October and ends in May. At the end of the regular season, there are used two methods to determine the final ranking: by dividing teams and ranking them into two groups according to their results and then playing monthly mini-tournaments or using a play-off eliminating system.

Another form of organizing the National Championship is an eight team tournament. The system involves organizing four monthly (September-December) tournaments where teams play against each other. The length of these tournaments is five days. After the last tournament, according to the classification two groups will be formed (1-4 and 5-8). Further on there will be organized a series of mini-tournaments for the two groups or a play-off elimination system will be used.

Regardless of the organizational system adopted, a particular training process is concretized to Politehnica water polo team. There are required different approaches in terms of volume-intensity, as well as technical-tactical particularities of the training process.

In case of weekly games, practices will have a low volume of work towards the first day of the game as well as an increase of intensity. The decreasing volume of work will allow more time to specific water polo exercises, including technical and especially tactical elements. However, there are particular situations before having an easier game and a longer period to prepare, extending the number of workouts with increased workload may be utilized. Tournaments of seven games over a five days period allow having practices between games, but these will have less volume of workload and will rely almost exclusively on technical and tactical elements. During a tournament because of an enormous waste of energy it is a key element to recover the athletes in an optimal time for the next game. Injury prevention is also an important aspect to be taken in consideration during games and practices. One common belief about stretching is that prevents injury. And it can within reason. But recognize that the benefits of stretching come over the long term, not from any single stretching session. Stretching before a practice does not reduce the risk of injury during that practice (Salo, et al., 2012). It is necessary to find ways to preserve the physical condition of important players in order for them to have maximum efficiency against opponents.

The play-off elimination system consists of games with similar conditions to the regular weekly games, with intervals between them allowing preparation that can fit in the specific method of weekly stages of the championship. In case of the 3-4 mini-tournaments system, teams of the two groups will play three games over two consecutive days, once a month. Since there is a large amount of time between tournaments, this approach allows a high volume of workout during the first period (approximately 2 weeks), enhancing the intensity of exercises and the use of specific technical and tactical elements.

Control tests are a way of checking the level of physical condition of athletes. It is also a requirement of the Romanian Water Polo Federation that allows the participation at the National Championship and verifies the level of coaching at each team. Tests are consisting of 100 m freestyle, 4 x 50 m freestyle leaving on 1 minute and / or 400 m freestyle. Goalkeepers verification includes a water treading test for 20/30/40/60 seconds with weights ranging from 5 to 15 kg. In terms of continuity of practices and treating practices seriously, an improvement is observed at young and very young players according to the results, while a slight and partial improvements, are observed in case of the other water polo players. Certainly the tests results highlight as well the cases where the performance has declined and individualized training is required (Federația Română de Polo pe Apă-Calendar Competițional, 2013).

Conclusions

The current study has been dedicated to present some particular characteristics of "Politehnica" water polo team from Cluj. Training patterns and other factors that influence the team's performance were also highlighted along the study. In conclusion we enounce the following suggestions:

- Recruitment and selection of junior players for the senior team should be managed more appropriately. It is necessary to establish echelons for children and juniors at the Polytechnic Sports Club;
- There is a need to register more players to the senior team, in case some of the players are not able to play in certain games;
- Additional individualized training is necessary for young and very young players to achieve a faster progress in order to improve the ability to integrate into the senior team;
- The coach must continually seek for support from the Water Polo Federation and from coaches of other valuable teams in order to improve and upgrade training methods;

- The recruitment of a sport manager it is also essential in order to achieve higher performance. A coach should focus more on the athletic training part of the team while one of the important tasks of a manager would be to obtain more financial resources to the team. Sports organizations exist to perform tasks that can only be executed through cooperative effort, and sports managers are responsible for the performance and success of these organizations (Covell, et al., 2003).
- The current situation in which the „Politehnica" water polo team finds itself is a delicate one, with funding only to support participation in the championship, with few and insufficiently motivated athletes. Therefore, it is necessary to attract sponsors to support the water polo team, consequently recruit better players and reward the current ones for their efforts. Having a good ranking in the National Super League means a valuable team, with financially motivated players having all necessary practice conditions provided in order to achieve a good performance.

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SWIMMING THERAPY FOR SCHOOL CHILDREN WITH FUNCTIONAL SPINAL CORD DISORDERS AND ASTHMATIC SYMPTOMS

DÁNIEL LŐKÖS[1], ISTVÁN GYENE[2], KORNÉL SIPOS[1], LÁSZLÓ TÓTH[1] & PÁL HAMAR[1]

ABSTRACT. The first author, a physiotherapist, has organized swimming therapy sessions and has taught elementary school children to swim in satellite settlements of Budapest (Fót, Dunakeszi and Erdőkertes) and Újpest (the fourth district of Budapest) for more than ten years. The applied teaching method has been built on previous studies at Semmelweis University, Faculty of Physical Education and Sport Sciences and the special method of group swimming therapy for children under eighteen years by Jády (2002). According to the *"Will-model"* „Akarat-modell" (Gyene, 2006), the following question was investigated: How do standard psychomotor tests including rhythm change running, boomerang running, balance test on one foot & obstacle course (Farmosi and Gaál S-né, 2007), as well as physical self-concept and motivation skills, differ from each other, and from body mass index, in a homogeneous group of children of decimal age, who take part or do not take part in swimming therapy sessions because of their functional spinal cord disorders? In this article it is reported that after 18 months, in 2011, the follow-up research revealed some changes in the variables of the former study for the group taking part in swimming therapy and the control group without functional spinal cord disorders not taking part in swimming therapy.

Keywords: sport therapy, therapeutic swimming, anxiety, motor abilities, physical self-concept, follow-up examination

Introduction

Development of swimming therapy

Swimming therapy (STH) started with swimming education organized for asthmatic patients in Hungary in the 1970s. The "Akarat-modell" (Will-model)

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STH educational program worked out by István Gyene, and its innovation – the the breathing function values of asthmatic children who regularly do organization of the sessions during the symptom-free periods of asthmatic patients – has been in use since 1973. The method is extremely effective because sport continue to improve, the number of symptom-free days increase, their medicinal requirements are much less, their stamina improves, and their physical capacity reaches the same level as that of healthy children. (Gyene, 2006)

The two most important factors related to controlling asthma in economic terms are the reduced number of days with symptoms and the consumption of medicines, as the expenses related to asthma are estimated to be higher than the combined costs of TBC and HIV/AIDS (Dobosné Nádházi, 2009). It is a fact that therapeutic swimming has a favourable cost-benefit ratio; its organization does not require much effort, it has no side-effects and the breathing problems caused by loading can be handled by with its use. Based on the successful programs, the National Health Insurance Fund (OEP) made it possible in the 1980s and 1990s to support the treatment of patients with internal, orthopaedic and neurological disorders and help prevent of these diseases.

Jády (1996, 1997) reported that asthmatic people's STH cannot be limited to the teaching process of swimming, as the improvement in the personality characteristics of asthmatic children becomes increasingly necessary because of the psychosomatic character of the illness. Physicians and psychologists pay special attention to the patient's personality and family relationships. It seems to be important to attach a long-term aim: holding a recreation activity program for parents in which they can learn the proportion of the factors influencing the state of health, which are as follows: lifestyle – 43%, genetic factors – 27%, environmental effects – 19%, medical care – 11%.

Personality problems can be decreased with the help of sport. It is important to develop a model for athletes based on positive values, and to display to them the need and respect for sport and training. In addition, discipline and self-control have to be presented as values so that the participants taking part in physiotherapy sessions obtain positive self-esteem. The convincing of parents and the lessening of their anxiety in relation to the fact that their children need physical exercise might be problematic. Therefore, the families of those children taking part in STH sessions are encouraged to join the sessions. (Gyene and Lőkös, 2009)

Parents overprotect their asthmatic kids; they make them feel that even a minimal physical load can cause dyspnoea. Asthmatic children's aims are special compared with those in competitive sports. The special motivation is typically given by the tasks which increase self-confidence in the asthmatic children. (Jády and Szánthó, 1998)

The HRG® (Hydrotherapeutic Rehabilitation Gymnastic) method is a Hungarian rehabilitation procedure that was patented in 1994. It is characterized by a neurological and sensomotor examination preceding its application. The maturity of the children's nervous system can be given in percents with its help, and the profile of existing abilities – partial abilities and defects – can be determined as well. The HRG® training sessions are planned by taking these items into consideration, so the actual maturity level of the individuals is known when the group is created. The regular and sufficiently intensive use of the HRG method with exercise has a positive effect on the normalization of the corpus striatum control of the central nervous system. In line with this, the patterns which are necessary for the successful regulation of behaviour and the development of cognitive functions help the conformation of the positive transfer processes (Lakatos, 1994, 1999).

Effect of therapeutic swimming on quality of life and state of psychomotor skills

Balla (2009) examined the effect of regular physical activity on the endurance and life style of asthmatic children. He proved that complex sport therapy, based on Gyene-type swimming therapy, has a positive effect on the running endurance of asthmatic children. This endurance of swimmers with asthma proved to be significantly better compared to non-swimming asthmatic and healthy children. Balla found that the rate of being overweight and obese was smaller for those who swam compared to non-swimmers.

Weisgerber et al. (2003) examined the effects of swimming on asthmatics and concluded that endurance developing movements executed in the water have a decisively positive effect on treating the symptoms of the illness.

Rosemini (2003) examined the effects of swimming therapy on asthmatics of lower primary school age and those of an adolescent age. He found that the subjective feeling of the symptoms decreased with swimmers of all ages.

Wedderkopp et al. (2004) found a significant decreasing tendency in the level of training-related preparedness, body mass index (BMI) and the time spent doing physical activity compared to the previous years while he was examining children from Denmark and the European Union.

Preliminary results of this study

The results of those participating in school PE lessons in Újpest (4th district of Budapest) in the Bajza Street Primary School (N=93) and two examination groups (the swimming therapy group with functional spinal cord disorders (N=26) and the complex sport-therapy group with functional spinal

cord disorders and asthmatic problems (N=15), differed from each other in two running performances. The therapeutic group's times measures of rhythm change running and the obstacle course showed significantly poorer than the control group's (Group A: rhythm change running, Group B: obstacle course). (Lőkös and Sipos, 2009).

The total therapy group (N=41) reached worse result in rhythm change running test than the control group in the 1st examination. Results of the total sample didn't show gender differences. The boys from the total control sample had significantly better results in the rhythm change running than the girls. To the total sample matched control group had better results in the rhythm change running.

Considering the fact that the results of the children with functional spinal cord disorders taking part in STH sessions didn't lag behind the results of the control group comprised of healthy children, it can be stated as fact that the development of physical and mental health was effectively realized in the carrying out of STH. (Lőkös, 2010)

The aim of the study

Our aim is to present how the rhythm skill, spatial orientation, static balance ability and complex skilfulness, and self-concept of children with functional spinal cord disorders and mild/moderate asthmatic symptoms have changed as a result of the effect of STH and complex sport therapy programs.

The method and sample

In Hungary four to five thousand children under eighteen years of age took part in the STH program, which consisted of special swimming teaching supported by the National Health Insurance Fund (OEP). In the fourth district of Budapest this number was 300-400. With sampling, the first element was to create subgroups for the homogeneous group based on sex, age, health condition, level of swimming skill and the effects of school (for example, PE lessons, school requirements, teachers' personalities). In the first through fourth grades (N=123) of Bajza József Primary School in the fourth district of Budapest, functional spinal cord disorders (functional scoliosis - without spinal cord deformity) and overweight conditions appeared with a high frequency. That is why these characteristics made these students (N=26) suitable for participation in the STH program. Their classmates were also involved in the study; thus, we could create a control group according to gender, decimal age and body mass index. The swimming therapy group members (N=15) with functional spinal cord disorders and asthmatic symptoms were exposed to exciting additional training programs – running, gymnastics, bicycle riding and skiing training – and together with the above-mentioned control group, they were examined twice.

One-four class pupils (N=221) of the Bajza József Primary School in Újpest served as the reference sample of our study.

A) Swimming therapy group (with functional spinal cord disorders);

- 8.5-11 year old boys (N=11);
- 8.5-11 year old girls (N= 15);

B) Complex sport-therapy group "Will-method" (with functional spinal cord disorders and mild/moderate asthmatic symptoms);

- 8.5-11 year-old boys (N= 8);
- 8.5-11 year-old girls (N=7).

The three groups (Group A - swimming therapy group of children with functional spinal cord disorder; Group B - complex sport therapy with swimming therapy for children with asthmatic symptoms and functional spinal cord disorder; and control group (Group C) of healthy children according to gender, decimal age and body mass index) were examined with the following scales:

1. In the Tennessee Self-Concept Scale (TSCS-H) A test, 12 yes-no-I do not know (true or false) answers could be given. After a quick evaluation, the body image of the child can be easily determined. The higher the total scores, the better their self-evaluation was.
2. Standard psychomotor tests – rhythm change running, obstacle course, boomerang running & balance test on one foot.

Skills	Factors	Tests
Coordination	Rhythm skill	Rhythm change running
	Spatial orientation	Boomerang running
	Static balance	Balance test on 1 foot
	Complex skilfulness	Obstacle course

(Farmosi and Gaál, 2007)

Each person was examined twice in a longitudinal examination. Eighteen months transpired between the first and final measurements.

Hypotheses

It was assumed that the following changes would be observed in children with functional spinal cord disorder and asthmatic symptoms taking part in the swimming therapy group after eighteen months:

- their result of the self-concept scale would be more favorable,
- their rhythm skill, spatial orientation, static balance ability and complex skilfulness would improve,

- their results of motor tests, and physical self-concept will be significantly better than those of the healthy control group,
- the complex sport-therapy with running, skiing and cycling camps (Group B) has a more favorable effect on physical self-concept and motor skills than the only swimming therapy (Group A).

Results

The examination repeated 18 months later showed more favorable changes in all motor tests in Group B (N=15). Static balance test differed significantly in both examinations (p<0,003). There was an even more significant difference in self-concept scale (p<0.002), and the greatest difference could be observed in the rhythm change running, obstacle course, and in boomerang running (p<0.000) (Table 1).

Table 1.

Comparison of examinations 1 and 2 results of the complex sport therapy group (Group B)(N=15)

Paired T-test						
Variables	**N**	**Mean**	**SD**	**t**	**df**	**p<**
Rhythm change running (sec) 1	15	5,50	0,27	-6,962	14	**0,000**
Rhythm change running (sec) 2	15	**5,11**	**0,78**			
Obstacle course (sec) 1	15	21,55	2,20	-6,977		**0,000**
Obstacle course (sec) 2	15	**17,07**	**4,25**			
Static balance (sec) 1	15	43,20	17,75	3,572		**0,003**
Static balance (sec) 2	15	**57,13**	**6,69**			
Boomerang running (sec) 1	15	19,65	2,95	-5,860		**0,000**
Boomerang running (sec) 2	15	**16,06**	**4,36**			
Self-Concept Scale: physical self-concept 1	15	27,40	4,03	3,777		**0,002**
Self-Concept Scale: physical self-concept 2	15	**31,60**	**3,96**			
Body Mass Index 1	15	18,34	3,25	-0,065		0,949 n.s.
Body Mass Index 2	15	19,19	2,80			

All scales in the two examinations correlate with each other significantly expect Self-Concept Scale (from p< 0.00 to 0.069) (Table 2).

Table 2.

Test-retest correlation of BMI, physical self-concept scale and motor skills for complex sport therapy group (N=15)

Variables		N	Correlation	Sig.
Pair 1	**Rhythm change running 1/2**	15	.971	.000
Pair 2	**Obstacle course 1/2**	15	.990	.000
Pair 3	**Static Balance 1/2**	15	.722	.002
Pair 4	**Boomerang running 1/2**	15	.962	.000
Pair 5	**Self-Concept Scale: physical self concept 1/2**	15	.481	.069
Pair 6	**Body Mass Index 1/2**	15	.951	.000

The swimming therapy group had significantly better results in all of the psychomotor tests: in rhythm change running ($p<0.000$), in obstacle course ($p<0.003$), in static balance ($p<0.014$) and in boomerang running ($p<0.000$) (Table 3).

Table 3.

Comparison of data of examinations 1 and 2 in swimming therapy group (Group A) (N=26)

Paired T-test						
Variables	**N**	**Mean**	**SD**	**t**	**df**	**p<**
Rhythm change running (sec) 1	26	5,98	0,54	-10,267	25	**0,000**
Rhythm change running (sec) 2	26	**4,88**	**0,63**			
Obstacle course (sec) 1	26	24,13	2,94	-3,314		**0,003**
Obstacle course (sec) 2	26	**22,48**	**2,13**			
Static balance (sec) 1	26	37,30	22,52	2,637		**0,014**
Static balance (sec) 2	26	**49,16**	**16,93**			
Boomerang running (sec) 1	26	20,06	3,28	-6,209		**0,000**
Boomerang running (sec) 2	26	**15,69**	**2,89**			
Self-Concept Scale: physical self-concept 1	26	29,07	3,64	1,663		0,109 n.s.
Self-Concept Scale: physical self-concept 2	26	30,23	3,31			
Body Mass Index 1	26	18,22	3,73	1,254		0,222 n.s.
Body Mass Index 2	26	18,70	3,59			

The positive change displaying all scales in the two examinations correlate with each other significantly (from p< 0. 00 to 0.014) (Table 4).

Table 4.

Test-retest correlation of motor skills, physical self concept and BMI for swimming therapy group (Group A)(N=26)

Variables		N	Correlation	Sign.
Pair 1	**Rhythm change running 1/2**	26	.584	.002
Pair 2	**Obstacle course 1/2**	26	.565	.003
Pair 3	**Static balance (seconds) 1/2**	26	.351	.009
Pair 4	**Boomerang running 1/2**	26	.337	.001
Pair 5	**Self-Concept Scale: physical self-concept 1/2**	26	.486	.014
Pair 6	**Body Mass Index (BMI) 1/2**	26	.869	.000

The total therapeutic swimming sample (N=41) (Group A + Group B) got statistically better results in obstacle course (p<0.004), and in self-concept scale point (p<0,018) than the control group (N=41) (Table 5).

Table 5.

Comparison of the total STH group (N=41) and the control group (N=41) in the 2nd examination

Two-Tailed T-test						
Variables	**N**	**Mean**	**SD**	**t**	**df**	**p<**
Rhythm change running (sec) STH group	41	4,97	0,69	1,945	80	*0,055 n.s.*
Rhythm change running (sec) control group	41	4,68	0,65			
Obstacle course (sec) STH group	41	**20,50**	**4,02**	-2,994		**0,004**
Obstacle course (sec) control group	41	22,95	3,39			
Static balance (sec) STH group	41	52,08	14,49	0,773		0,442 n.s.
Static balance (sec) control group	41	49,58	14,75			
Boomerang running (sec) STH group	41	15,83	3,45	-0,864		0,390 n.s.
Boomerang running (sec) control group	41	16,42	2,65			
Physical self-concept Scale STH group	41	**30,73**	**3,58**	2,419		**0,018**
Physical self-concept Scale control group	41	28,71	3,99			
Body Mass Index STH group	41	18,88	3,29	-0,196		0,845 n.s.
Body Mass Index control group	41	19,04	3,91			

The time of the obstacle course (p<0.002), and self-concept scale points shows an even greater statistical difference (p<0.011) for the complex sport therapeutic swimmers compared to the control group in examination 2. (Table 6)

Table 6.

Comparison of complex sport therapeutic group (Group B) (N=15) and the control group (N=15) in the 2nd examination

Paired T-test						
Variables	**N**	**Mean**	**SD**	**t**	**df**	**p<**
Rhythm change running (sec) STH group	15	5,11	0,78	1,300	28	0,204 n.s.
Rhythm change running (sec) control group	15	4,75	0,74			
Obstacle course (sec) STH group	15	**17,07**	**4,25**	-3,386		**0,002**
Obstacle course (sec) control group	15	22,28	4,18			
Static balance (sec) STH group	15	57,13	6,69	1,424		0,169 n.s.
Static balance (sec) control group	15	51,73	12,99			
Boomerang running (sec) STH group	15	16,06	4,36	-0,359		0,722 n.s.
Boomerang running (sec) control group	15	16,53	2,64			
Physical self-concept Scale STH group	15	**31,60**	**3,96**	2,727		**0,011**
Physical self-concept Scale control group	15	27,67	3,94			
Body Mass Index STH group	15	19,19	2,80	0,104		0,918 n.s.
Body Mass Index control group	15	19,06	4,01			

There was no statistically significant difference between the swimming therapy group (N=26) and the non-swimming control group (N=26) selected by decimal age, gender and body mass index in the motor tests and self-concept scale point (Table 7).

Table 7.

Comparison of swimming therapy group (Group A) (N=26) and the control group (N=26) in the 2nd examination

Paired T-test						
Variables	**N**	**Mean**	**SD**	**t**	**df**	**p<**
Rhythm change running (sec) STH group	26	4,88	0,63	1,433	50	0,158 n.s.
Rhythm change running (sec) control group	26	4,64	0,60			
Obstacle course (sec) STH group	26	22,48	2,13	-1,240		0,221 n.s.
Obstacle course (sec) control group	26	23,34	2,85			
Static balance (sec) STH group	26	49,16	16,93	0,185		0,854 n.s.
Static balance (sec) control group	26	48,32	15,79			
Boomerang running (sec) STH group	26	15,69	2,89	-0,841		0,404 n.s.
Boomerang running (sec) control group	26	16,35	2,70			
Physical self-concept Scale STH group	26	30,23	3,31	0,910		0,367 n.s.
Physical self-concept Scale control group	26	29,31	3,97			
Body Mass Index STH group	26	18,70	3,59	-0,309		0,759 n.s.
Body Mass Index control group	26	19,03	3,92			

Conclusions

The examination after 18 months swimming therapy showed positive changes in motor tests and in self-concept scale result in the examination groups. Group A had better results in psycho-motor tests, the self-concept score didn't change in the second measurement. The complex sport therapy program had more favorable effect than the only swimming therapy, because Group B had better results not only in all of the motor tests, also in self-concept scale. So the first hypothesis proved only in part, but the second hypothesis is certified without limitations.

The total sample (Group A + Group B) got statistically significantly better results in the obstacle course and in the physical self-concept scores compared to the control group. There was no statistically significant difference between Group A and its control group. The complex sport therapy group showed significantly better results in obstacle course and physical self-concept scores than the control group after the 18 months therapy, even took the obstacle course test longer time for Group B before the therapeutic program. The relevant hypothesis was partially justified.

Both the swimming therapy's and the complex sport therapy's aim to help of the development of health-consciousness and personality of children, in most cases, with serious diseases. The joy of the play and exercise is enhanced by the swimming therapy and sport as well. *(www.eduvital.hu/2013.04.03.)*

The exercise is a basic component of the intensive and complex enrichment of the developmental processes in the period of preadolescence. The physically active lifestyle is the fundament of the primer and secondary prevention of diseases such asthma and different orthopedic problems. The collective swimming therapy program has favorable effect on the motor development of the 8-11-year-old school children with functional spinal cord disorders.

In the complex sport therapy group, there was a significant improvement of all examined motor tests in our study. The exercise program was more complex, the improvement of different motor skills shown more expressed development. The spinal cord disorder children's regular attendance the complex sport therapy sessions resulted in complex skillfulness and the positive change of the physical self-concept. The 4th hypothesis was totally proved.

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SPORTS, GENDER AND SOCIAL INCLUSION

IOAN NICULAIE NEGRU[1]

ABSTRACT. Nowadays, especially in the more developed countries, people are discussing the importance of sports not just in maintaining a healthy life and a balanced development, but also in shaping the identity and social integration of individuals. By running through a vast series of the most recent articles, we have succeeded in summarising several positive aspects of the sports phenomenon. We have tried to bring to attention some reasons for which young people take part in sports activities and at the same time, we have underlined a list of reasons that determine the young people to quit on sports. In the specialised literature, a series of reasons stand out for which the involvement of people in sports activities is also determined by gender differences.

Key words: Sports, gender, social integration, identity, young people

REZUMAT. Sportul, genul şi incluziunea socială. În zilele noastre, mai ales în ţările dezvoltate, se vorbeşte despre importanţa sportului nu doar în menţinerea sănătăţii şi a dezvoltării armonioase, ci şi în formarea identităţii şi a integrării sociale a indivizilor. Parcurgând o serie vastă de articole, dintre cele mai recente, am reuşit să sintetizez câteva aspecte pozitive ale fenomenului sportiv. Am încercat să aducem în atenţie câteva motive pentru care tinerii participă la activităţile sportive şi, totodată, am subliniat o serie de motive care-i determină pe aceştia să renunţe. În literatura de specialitate, se evidenţiază o serie de motive pentru care participarea subiecţilor la activităţile sportive este determinată şi de diferenţele de gen.

Cuvinte cheie: Sport, gen, integrare socială, identitate, tineri.

Due to its valences, sports are oftentimes the essence of different programmes created by different organisations/institutions, being related to teaching and developing skills in young people, which will be necessary to them all throughout their lives.

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Sports, dance, music, theatre are all important aspects of living one's life, while being at the same time a real support for building the individual identity (Aittola, 1998, apud Telama et al., 2005, p. 116). Through different sports-related reunions in young people communities, the goal is not just that of building certain social and cognitive competences which will be later on applied in other fields of life, but also that of developing the initiative and intrinsic motivation, which sometimes school activities lack in (Eccles and Gootman 2002). Gradually, pastime activities including sports activities start to complete or take over a series of tasks that in the past used to belong to the school or to the family.

By making a reference to leisure time activities which include sports, we underline the fact that, through this, young people have the possibility of gaining a range of competences, which can increase self-esteem, can lead to forming new friendships, while having the opportunity of manifesting their individual identities as well as that of evaluating the identities of those around them (Kely and Godbey 1992, apud Telama, Nupponen, Pieron 2005, p. 117). The benefits of practising physical activities on the individual (Kimm et al., 2002, apud Arteaga and Maureen, 2004), are manifold, including positive social development, as well as a decrease in the risk of chronic diseases. Young people who are active from a point of view of physical effort present a better general state of health, as the risk of becoming overweight is greatly reduced.

Studies show the fact that in Western countries young people, especially boys, build their own identity in relation to physical activity and/or sports, which was used initially as a shaper or character, of moral values or as a means of military training. Through sports, among others, young people build their body image, which has become a reflection of wealth nowadays.

Through its particularities and at the same time, sports promote competition, ever so present in capitalist societies, which teaches the participants to become strong, competitive, and eager to attain success.

On the other hand, by means of sports, young people can learn working in a team, by practising at the same time their decision making ability. Creating a specific context as close as possible to that of the community is essential for the development of young people communities, therefore "when young people are working collectively with other colleagues and adults to reach a common goal, they are in fact practising problem solving, by developing at the same time their decision making ability" (Perkins and Noam, 2007, p. 77).

According to Havighurst (1972), physical activities and sports, together with other fields, have a determinant role in the process of development and socialisation of young people, contributing to the accomplishment of the educational process by "creating new social relations; adopting the gender role; accepting one's own body; gaining emotional independence towards parents and other adults; preparing for marriage and family life; preparing for work; developing a perception/ideology on the world; adopting a responsible social behaviour" (apud Telama et al., 2005, p. 117).

Starting from Popitz's theory (1987), according to which the individual seeks recognition in five types of social subjectivity, Weiss (2001) underlines the fact that the individual can also find social acceptance through sports. The five types of social recognition are the following: recognition in an attributed role (behaviours of this type include features determined by age, gender, social class); recognition as member pertaining to a group (in this case the individual wishes to be like the others, developing a sense of belonging, this happening mostly in team sports); recognition in an achieved role (the success in sports is ensured by achieving performance); recognition in a public role (the public expects performances which he later on recognises); recognition of personal identity (each individual manifests the desire to be recognised as an individual in the society). This can be pointed out by individual sports, inaccessible to the majority of the people, such as horseback riding, golf, ski, tennis or by those sports in which the elite tries to differentiate itself from the vast majority. (Weiss, 2001, pp. 393-395)

Sports, especially team sports, support the development and integration of individuals into the society. As demonstrated by various studies, the involvement in team sports of minorities enables the feeling of belonging to the traditional communities, due to the direct contact with the members of the community, therefore facilitating their integration into the community. In this way, the participants/ players, who are often placed in the circumstances of solving together some game-related situations, get to the point of mutual acceptance. they learn to communicate with the goal of adopting viable solutions, which later on can translate outside of the sports field, allowing for quality social relationships to be formed (Weiss, 2001, apud Walseth, 2006, p. 451).

Sports, through their particularities, give young people the chance of relating to each other, to get to know the other better, therefore creating friendships or affiliations to various groups and at the same time proving that those who participate in different sports activities/ sports are more sociable even outside of sports (Gavriluță, 2010, pp. 36-42). A series of social symbols, such as values, norms, principles can be experienced through sports which are more than a micro cosmos of the society (Weiss, 2001). For the majority of people, sports are an ideal form of communication, which functions based on some symbols (Olympic circles, emblems, flags, Olympic flames, grades, records etc.). Gaining emotional independence from one's parents or other adults as well as accepting one's own body and its functions contributes to the development of one's personality and individual identity. "Sports are an ideal means for enforcing the identity" (Weiss, 2001, p. 395). For some sociologists, sports are perceived as a "support, means and context of accomplishing the socialisation process" (Gavriluță, 2010, p. 73).

Regarding the involvement of young people in physical activities/sports, there are a variety of studies (Biddle et al., 2004; Caspersen, et al., 2000; Telama and Yang, 2000) which highlight a decrease in participating in such activities proportional with aging; it has also been established that individuals coming from ethnic minorities or from less fortunate socio-economic backgrounds, take part in physical activities/sports in a far lower number (Lee et al., 2009, p. 59). Regarding the involvement of students in sports activities, the decrease is partly owed to transitioning to the teenager period in which we should point out gender and ethnic differences (Kimm and Barton, 2002, apud Arteaga and Maureen, 2004). Young people who are less active during this stage and do not form the habit of engaging in different physical activities have every chance later on to become sedentary people. According to Arteaga and Maureen (2004) the decrease of the participation rate of teenage girls in physical activities is owed to several factors, out of which we can mention the lack of time, a weak motivation, the lack of skill or of opportunities to practise a certain sports branch. A series of studies have shown that young girls who have a low participation rate in sports activities spend more time in front of the TV/PC, ingesting at the same time high-calorie products, which leads to gaining weight. Apart from this, seasons also influence the participation in sports activities, a well-known fact being that in seasons with higher temperatures young people are more inclined to physical efforts.

Studies conducted on women as ethnic minorities in their relationship with sports have highlighted the poor involvement of these in sports activities. Surveys done in Europe with relation to women who are part of ethnic minorities and their participation in sports activities show that the number of those involved in sports is far more reduced than that of men pertaining to ethnic minorities as well as lower than the number of indigenous women. Other statistics conducted in the USA have pointed out that girls of African origin in America are less active than European girls who also live in the US.

Some researchers perceive cultural and religious boundaries as a potential obstacle in involving women belonging to minorities in sports activities (Walseth, 2006). Gender differences, the socio-economic status, transitioning from high school to college, are all factors which lead to the decrease of the participation rate in physical activities/sports (Kilpatrick et al., 2005, p. 87).

In another interpretation, the low rate of participation in physical activities of girls can also be explained by the fact that girls are more sceptical towards their inclination for sports, attributing at the same time a less important meaning to sports results (Fredericks and Eccles, 2002, apud Pedersen, 2004). Unlike boys, girls do not wish as much to create an identity by means of sports, as they are more study-oriented, desiring to prove themselves by accumulating knowledge in various fields.

Conclusions

Starting from several articles, which approach the domain of sport, we can emphasize the role of sport in the development of subjects' identity. The Sport offers to the young people the possibility to be involved in making decisions, developing also their capacity to work in a team. Speaking about the integration of individuals, especially minorities, the sport represents a real support in this sense, even there is a lot to do in this way. As we get older, the participation in sport activities diminishes, the same fact being observed at the level of families with lower incomes. The women attendance in sport activities is weaker regarding the men being involved in this kind of activities, but the articles emphasized that the women are not so preoccupied to reach the performance, in different contests, as the men are.

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IMPROVING THE REACTION TIME OF SECONDARY SCHOOL PUPILS (GRADES V-VI) THROUGH CREATIVE EXERCISES SPECIFIC FOR SCHOOL BASKETBALL

ADRIAN PAŞCAN[1]

ABSTRACT. The paper shows a pragmatic strategy in order to optimize the means for improving the reaction time of secondary school pupils (grades V-VI). In order to improve this psychomotor skill within the field of basketball in secondary school we used certain exercises and practiced them with the pupils, exercises which demanded fast reactions upon different signals (sound, tactile, visual), starting from different initial positions. During the first phase specific exercises as responses to different signals were conceived under our guidance with the entire class, which were then practiced. During a second phase, after having understood the task, the children devided into teams needed to conceive similar exercises. The most significant were then practiced with the entire class, using up front practicing (with even and individual pace), in pairs or goups. As a result of processing the information gathered during the final tests, it can be observed that the values of the trial group are better than the ones of the control group. This fact proves the efficiency of the independant variable (strategy and applied exercises) and its influence on the dependant variable meaining the results obtained and the improvements pointed out. The paper describes some of the exercises used and applied to the trail group.

Keywords: skill, psychomotor skill, reaction time, sound signal, visual signal, initial position, technical procedure.

REZUMAT. Dezvoltarea vitezei de reacţie la elevii de gimnaziu (clasele V-VI), prin exerciţii creative specifice baschetului şcolar. Lucrarea prezintă o strategie pragmatică în vederea optimizării mijloacelor pentru dezvoltarea vitezei de reacţie la elevii din ciclul gimnazial (clasele V-VI). Pentru dezvoltarea acestei aptutidini psihomotrice, în cadrul disciplinei baschet la ciclul gimnazial, am folosit şi am exersat cu elevii exerciţii care au necesitat reacţii rapide la diferite semnale (sonor, tactil, vizual), pornind din diferite poziţii iniţiale. În prima fază, cu toată clasa, sub îndrumarea noastră au fost concepute şi s-au exersat exerciţii specifice

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cu răspunsuri la diferite semnale urmand ca, in faza a doua, după înţelegerea sarcinii, elevii împărţiţi în formaţii de lucru diferite să conceapă exerciţii analoage. Cele mai semnificative au fost exersate cu toată clasa folosind exersare frontală (în tempo uniform sau individual), pe perechi sau pe grupe. În urma prelucrării datelor obţinute la testările finale se poate observa că valorile obţinute de lotul experimental sunt superioare lotului martor. Acest fapt demonstrează eficacitatea variabilei independente (strategia şi exerciţiile aplicate) şi influenţa acesteia asupra variabilei dependente reprezentată de rezultatele obţinute şi de progresele evidenţiate. Lucrarea descrie câteva din exerciţiile aplicate lotului experimental.

Cuvinte cheie: aptitudine, aptitudine psiho-motrică, viteza de reacţie, semnal sonor, semnal vizual, poziţie iniţială, procedeu tehnic.

General Remarks

Reaction time is a manifestation form of speed, depending on the five components (appearance of the impulse with the receptor; transmission with the corresponding means; analysis of the impulse – which takes the most time; transmission with the corresponding means; stimulation of muscles). *„Reactions are either simple or complex. Simple reactions are when the response comes as an answer to a movement already known and which occurs spontanously. Complex reactions mainly show in bilateral games, but also in sports, where the answer needs to take into account the actions of a „partener" or „opponent"* (cf. Cârstea,G., 1996).

Some research done by Thorner (cf. Cârstea, Gh., 1997) lace the latent time somewhere between 140 and 180 miliseconds (140 ms with tactile stimuli, 150 ms with sound signals, 180 ms with visual signals).

Reaction time has different manifestation indicants for each body segment. The best indicants are generally registered with the upper limbs, according to conducted research.

Reaction timp decreases (improves) under the influence of specific exercises within age 8 and 25, then it comes to a stillstand until around an age of 60 years, when it starts to decrease. As it is a psychomotor skill with a great degree of heritability (heredity approximately 90%), it can be improved, but within narrow boundaries.

Reaction time has its peak around the age of 20.

In order to improve the reaction time in basketball in secondary school we used and practiced with the pupils certain exercises which called for fast reactions at different signals (sound, tactile, visual), starting from different initial positions.

Hypothesis

We consider that by applying a set of creative exercises specific for the game of basketball, conceived by the teacher together with the pupils the reaction time improves significantly.

Aim of the paper

Showing an optimal number of specific exercises for the improvement of the reaction time in pupils of grades V and VI, according to the existing didactic premisses and infrastructure, in order to improve the instruction process in secondary school basketball.

Location and materials

The trail took place at „Nicolae Titulescu" school from Cluj-Napoca. The school is well equipped for meeting the demands of the school curriculum for basketball.

Subjects of the trial

Pupils from grades V and VI of „Nicolae Titulescu" school Cluj-Napoca were subjects in the trial.

106 pupils took part in the trial, 52 girls and 54 boys, equally devided into trail groups and control groups.

Table 1.

Number of sample of the form

Grade	Boys		Girls		Sum
	Trial	Control	Trial	Control	
a V-a	14	14	14	14	**56**
a VI-a	13	13	12	12	**50**
Total	**27**	**27**	**26**	**26**	**106**

The trial groups were made up of pupils from grades V A and VI B, and the control groups of pupils from groups V B and VI A.

Organisation, phases and development of the trial

The trail took place under normal conditions during the physical education classes with focus on (learning topics) basketball, according to the structure of the school year, devided into semesters and focusing on the suggested work hypothesis.

The trail took place from October 2011 to February 2012.
The trial consisted of **4 phases:**
Phase no. 1 – *pre-trail:* October, 10th – 14th 2011.
Phase no. 2 – *trial* (per se): October, 16th – November, 14th 2011.
Phase no. 3 – *post-trial:* November, 18th – November, 22nd
Phase no. 4 – *retesting* (February, 10th – December, 20th)

Investigation Methods

The reaction time is tested using the gymnastics stick with the test of the „falling stick". The stick was graded every centimeter, starting with 0, 1, 2, 3, ..., n up to the other end. The pupil from a standing position, feet slightly appart and with the right (left) arm in front, slightly bended from the ellbow holds the palm open oriented towards the stick and with the side where the 0 grading is. The tester releases the stick by surprise and the pupil needs to catch it as fast as possible. The distance from point 0 to the point where the stick is grabed by the pupil is measured. The test is conducted three times and the average is recorded.

In order to improve the reaction time within the field of basketball in secondary school we used certain exercises and trained them with the pupils, exercises which demanded fast reactions upon different signals (sound, tactile, visual), starting from different initial positions.

In parts 2 - 3 of the lesson and in the fundamental parts 4 and 5, during each lesson the improvement of the reaction time was especially trained for 10 – 12 minutes (during the experimental phase). During the first phase specific exercises as responses to different signals were conceived under our guidance with the entire class, which were then practiced. During a second phase, after having understood the task, the children devided into teams needed to conceive similar exercises. The most significant were then practiced with the entire class, using up front practicing (with even and individual pace), in pairs or goups.

In the following we present the conceived exercises, which were applied on the trial group.

Table 2.

The conceived exercises applied on the trial group

1	Standing, ball in front of the body	Reverse comand: „All players run"- they will jump „All players jump" – they will dribble „All players dribble" – they will run	6 X	Spread out on the entire basketball court	Up front practice
2	Standing	Pupils run, the teacher suddenly shouts out a number and the pupils form a group of 3, 4, 5 (according to the number shouted out).	2 X	Spread out on the entire basketball field	Up front practice

3	Ventral decubitus	Upon a signal the pupils stand up and run, upon a second signal they lie down again face down, and so on (other starting positions can be introduced)	2 X	In columns of 4	Up front practice in rows
4	Standing, ball in front of the body	Special rebounder panel and catching the ball without it falling down	5 min	5 pupils per panel	Individual training
5	Standing, ball in front of the body	Passes at the wall bars and catching the ball without it falling down	5 min	3 pupils per wall bar	Individual training
6	Standing, ball in front of the body	Passes at the backboard, or at the wall with the rugby ball and catching the ball without it falling down	4 min	On 4 columns	Individual training
7	Standing, ball in front of the body	Standing dribbling, upon hearing the whistle clap hands twice and continue dribbling.	6 X	In a line on 4 rows	Up front practice
8	Standing pairwise, face to face, with a ball	One of the partners holds the ball in their hands, with arms steched out in front (the other pupil holds the arms wider, prepared at about 5cm under the ball. The pupil with the ball releases the ball suddenly and the partener needs to catch it before it reaches the ground (they change tasks)	4 X	Pairwise, with a ball	Up front practice, pairwise
9	Standing face to back, each with a ball	The one standing with the back at their partner dribbles standing, the other one holds the ball up in front. Upon signal "1" from the one at the back, the one in front dribbles twice and moves the ball fast from one hand to the other in front, upon signal "2" they jump 180º and catch the ball which is released by the team member (they change tasks)	4 X	Pairwise, each with a ball	Up front practice, pairwise
10	Standing face to back, pairwise	The one standing face forward holds a gymnastics stick vertically from one end, with the arm lifted up forward. Upon signal ("go") the stick is dropped and the one with the back (who dribbles standing) turns around at tries to catch the stick, before it hits the ground (they change tasks).	4 X	Pairwise, with a ball	Up front practice, pairwise
11	Standing face to face, pairwise	One of the pupils dribbles standing, while holding the other hand around and 5 cm from the upper end of the stick (they do not touch the stick), which is held by the other team member vertically. Suddenly the stick is dropped and the pupil dribbling standing needs to catch it by closing the palm (the dribbling does not stop).	6 X	Pairwise, with a ball	Up front practice, pairwise

12	Standing face to back with a ball	The one standing face forward shouts a number: "1" or "2" and will then pass the ball. According to the number shouted the team member will jump vertically with right, or left turning respectively at 180º, gets the ball, passes it back and returns to the initial position (they change tasks).	6 X	Pairwise, with a ball	Up front practice, pairwise
13	Standing, face to face with a ball, bended knees	One of the pupils passes randomly, the other team member will react correspondingly, i.e. if the pass is directly to the chest, catching the ball will be preceded by one clap of the hands; if they bounce pass the catching is preceeded by two claps of the hands.	6 X	Pairwise, with the ball	Up front practice, pairwise
14	Face to face, pairwise, each with a ball	The pupils dribble standing pairwise, while a pole is placed in between them. Upon hearing the whistle they will touch the pole fast with the hand that is not dribbling.	6 X	Pairwise, eacht with ball	Up front practice, pairwise
15	Face to face, pairwise, each with a ball	Dribblling standing with the right hand, upon hearing the whistle slap palms with the left hand (the pair reacting fastest wins). They change the hand for dribbling.	6 X	Pairwise, each with a ball	Up front practice, pairwise
16	Face to face, pairwise, each with a ball	Dribbling standing with the right hand, upon hearing the whistle moving the ball with dribble to the left hand and slap palms (with the right hand).	6 X	Pairwise, each with a ball	Up front practice, pairwise
17	Face to face, pairwise, each with a ball	Standing high speed passes, upon hearing the whistle the type of pass is changed.	2 min	Pairwise, with a ball	Up front practice, pairwise
18	Face to face, pairwise, each with a ball	Standing passes with 2 balls (one pupil does the bounce pass the other one the chest pass), upon hearing the whistle the pupils change the pass type (the one having bounce passed chest passes and vice-versa)	10 X	Pairwise, face to face with 2 balls	Up front practice, pairwise
19	Face to face, pairwise, each with a ball	Standing passes with 2 balls (one pupil does the bounce pass, the other one the chest pass), upon hearing the whistle they change the pass type (the one having done the chest pass, bounce passes and vice versa), upon hearing two whistles the initial pass types are trained.	4 X	Pairwise, face to face with 2 balls	Up front practice, pairwise
20	Pairwise, each with a ball	Game: „Stopping the dribbling"	2 min	Pairwise, each with a ball	Up front practice, pairwise

Results and discussions

Table 3.

Statistic indicators regarding the test "FALLING STICK" (trail group, boys)

Gr.	TRAIL GROUP								
	AVERAGE			S.D			V.C.		
	T1	T2	Ret.	T1	T2	Ret.	T1	T2	Ret.
V	**22,07**	**19,07**	**18,9**	**4,026**	**3,863**	**3,9**	**18,24**	**20,25**	**20**
VI	**19,61**	**14,76**	**14,4**	**2,466**	**2,153**	2,16	**12,57**	**14,58**	**14,11**

Table 4.

Statistic indicators regarding the test "FALLING STICK" (control group, boys)

CONTROL GROUP								
AVERAGE			S.D.			V.C.		
T1	T2	Ret.	T1	T2	Ret.	T1	T2	Ret.
21,64	**20,42**	**20,64**	**2,348**	**2,194**	**1,79**	**10,85**	**10,75**	**8,68**
19,53	**16,53**	**17,46**	**2,340**	**1,646**	2,09	**11,98**	9,57	**12,01**

Table 5.

Statistic indicators regarding the test "FALLING STICK" (trail group, girls)

Cl	TRAIL GROUP								
	AVERAGE			S.D.			C.V.		
	T1	T2	Ret.	T1	T2	Ret.	T1	T2	Ret.
V	**21,57**	**18,42**	**18,9**	**2,691**	**1,953**	**2,06**	**12,47**	**10,6**	**10,6**
VI	**20,41**	**15,41**	**15,75**	**3,04**	**1,552**	1,36	**14,89**	**10,07**	**8,66**

Table 6.

Statistic indicators regarding the test "FALLING STICK" (control group, girls)

CONTROL GROUP								
AVERAGE			S.D.			C.V.		
T1	T2	Ret.	T1	T2	Ret.	T1	T2	Ret.
21,64	**22,35**	**21,21**	**2,255**	**1,505**	**1,61**	**10,42**	**6,73**	**7,59**
20	**18,66**	**18,91**	**3,162**	**2,321**	2,75	**15,81**	**12,43**	**14,55**

Table 7.

Significance of the difference between the average in trail groups

Grade V boys	2,1
Grade V girls	3,2
Grade VI boys	2,4
Grade VI girls	4,4

With the boys' groups improvements are obvious at all grades, comparing T1 and T2 with significantly higher values as compared to the control group (image 1- 4).

The variability coefficient (V.C.) shows medium homogenity in almost all grades in the trial, except grade V, trial group, where low homogenity is recorded (20,25%).

With the retesting, except grade VI, which records a small improvement, the other grades record setbacks (image 1).

Girls record obvious improvements from T1 to T2 for the entire group taking part in the trial. Trial groups record better performance at the final test (image 2).

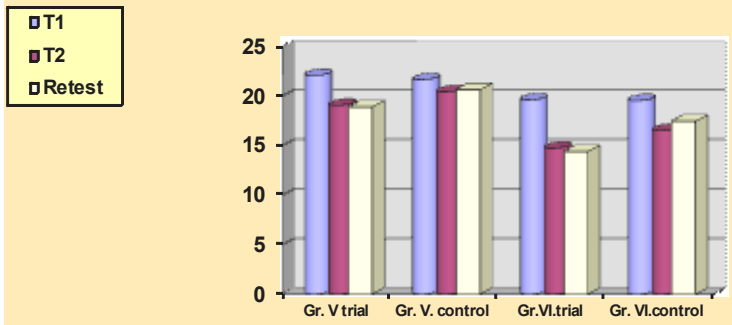

Image no.1 Graphic representation of the evolution of results obtained at the "falling stick" test (average boys)

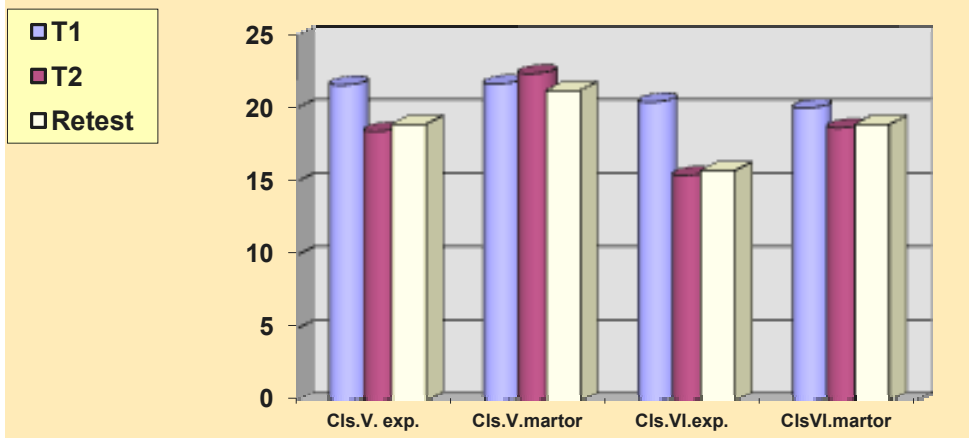

Image no. 2 Graphic representation of the evolution of res

The variability coefficient shows medium homogenity in all grades, except grade V, control group, where homogenity is high (6,73%).

With the retesting the girls, except grade V trial group, who record a lower performance, all other grades record a slight improvement.

The best improvement from T1 to T2 after applying the independent variable is recorded in trial groups of grades VI boys and girls.

Between the initial average of the group during the pre-trial phase and the final average from the post-trial group, as a result of calculating the significance index t student, significant differences are recorded, with a probability of 0,05%, except grade V boys, who present non-significant values. The strongest value is recorded in grade VI girls, also due to the fact that they recorded low values at the initial test.

Conclusions

1. The conceived and conducted exercises are efficient and contribute to the improvement of the reaction time.

2. We consider that the statistical indicators applied (means, standard deviation, variability coefficient, significance of the difference) allowed us to record valid and significant results, which the interpretation of the results of this research are based on.

3. After processing the data, at the final tests it can be observed that the values of the trial group are better than the ones of the control group. This proves the efficiency of the independent variable (strategy and applied exercises) and its infuelnce on the dependant variable represented by the results obtained and the progress pointed out.

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JUDO TRAINING PROGRAM PROJECT FOR PEOPLE WITH VISION IMPAIRMENT

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ABSTRACT. Tackling this research topic started from a reality: there are children with poorer eyesight than the standard, there are children who see virtually nothing. Nonetheless they should be able to enjoy the same outcome of education as their colleagues who do not suffer from such disabilities. In this research paper we try to surpass the idea that children in general, and children with vision impairment in particular, are of fragile biological nature and can thus not be subjected to physical exercise. Social compensation and recuperation of people with vision impairment through their nature imply as end goal the integration in social life by means of practicing a certain activity, in our case by practicing judo, with the additional achievement of balancing the personality from a moral point of view. Structured in 10 chapters the relevance and originality of the research paper is emphasized from the beginning, as it is for the first time in Romania, that tackling this topic is aimed at. In the first chapters the importance of eyesight in humans is discussed, theoretic and practical aspects of compensatory adaptation, scientific grounds of compensation phenomena, the contribution of practical activities in compensation and social integration of people with vision impairment. While dealing with the problem of diseases, symptoms and warning systems the paper presents the pupils selected from the High School for Pupils with Vision Impairment Cluj-Napoca. The pupils were selected both from the ones with visual impairment and from the ones with amblyopia with the help of the school's specialist subject teacher; the selection was preceded by a preparation for learning (motivational stimulation, raising interest for the sport which is going to be learned – judo).

Keywords: Program, Judo, People with vision impairment.

REZUMAT. Proiect de program de antrenament in judo la deficienţii de vedere. Abordarea acestei teme a pornit de la o realitate: exista copii care au o vedere mai scazută decât cea normală, există copii care nu văd de loc. Ca toţi ceilalţi copii ei ar trebui să se bucure de roadele educaţiei de care se bucură colegii lor normali. Încercăm să depăşim în această lucrare optica fragilităţii biologice în

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general a copilului şi în special al nevăzătorului, de unde teama de a-l supune unei încărcături fizice. Prin conţinutul ei, compensarea şi recuperarea socială a nevăzătorilor implică drept scop final integrarea în viţa socială prin practicarea unei activităţi, în cazul nostrum JUDO şi echilibrarea morală a personalităţii. Structura pe 10 capitole, încă de la început, se scoate în evidenţă actualitatea şi originalitatea lucrării de cercetare, fiind pentru prima dată în România când se încearcă abordarea acestei teme. În primele capitol e se scoate în evidenţa importanta vederii la om, aspecte teoretice şi practice ale adaptării compensatorii, bazele ştiinţifice ale fenomenelor compensatorii contribuţia activitaţii practice în compensarea şi integrarea socială a nevăzătorilor. Abordând problema afecţiunilor, simptomelor şi sistemelor de atenţionare, în lucrare se arată numărul elevilor selecţionaţi din Liceul pentru Deficienţi de Vedere din Cluj-Napoca.Acestia au fost selecţionaţi atât din rândul nevăzătorilor cât şi celor ambliopi cu ajutorul profesorului de specialitate din şcoala, acţiunea fiind precedată de o pregătire pentru învăţare (stimularea motivaţională, deşteptarea atenţiei pentru ramura sportive JUDO ce urmează a se invăţa).

Cuvinte cheie: Program, Judo, Nevazatori.

The chained and systematic nature of judo imposes longer term vision of the project setting the goals to be achieved progressively; first more general goals, then more and more specific goals.

Methodologically we set two stages for the instructive process of vision impaired people: beginners and intermediates.

General goals for the beginners

- Health strengthening and consolidation of correct body development, as a means of preventing accidents and trauma;
- Ensuring a harmonious physical development (somatic and functional);
- Gradual development and growth of basic motricity;
- Acquiring the techniques of selected basic judo elements and procedures in a means as accurately as possible;
- Developing habit and pleasure for physical effort;
- Developing moral-volitional qualities[2];
- Constant inclination of exceeding one's limits;
- Education in the spirit of discipline and individual as well as collective order;

[2] Volitional qualities = groups of psychical qualities, as mastering of will during the process of regulating actions.

- Achieving better psychic balance;
- Obtaining skills and theoretic knowledge which enable the evaluation of the personal training ideal;
- Achieving better integration of vision impaired people;
- Achieving o moral balance of personality.

Regarding the **technical instruction** during this phase the goal (of the beginners) is to develop a "theoretic model" which is to improve all qualities necessary for the young vision impaired judoka to be admitted to the next phase.

Achieving the goals finally leads to achieving the model corresponding to the analyzed period (6 months – one year).

Although we do not aim at assigning the youngsters with vision impairment in specialized physical training, differentiated according to training factors, we try to set goals from a physical, a technical, theoretical and psychological point of view.

From a physical point of view:

- Establishing and developing the sense of balance and orientation in space;
- Establishing and developing sense for movement rhythm;
- Developing the mobility of pelvis and the spine;
- Development of the body movement skills and coordination, as well as of the body segments.

From a technical point of view:

NE-WAZA (ground techniques);

- Learning the main immobilization forms from OSAE-KOMI-WAZA (mat holds):
  - KESA-GATAME;
  - KAMI-SHIHO-GATAME;
  - YOKO-SHIHO-GATAME;
- Learning the techniques of the group KANSETSU-WAZA (joint locks):
  - KESA-GARAME;
  - UDE-GARAME;
  - UDE-HISTIGI-JUJI-GATAME.

NAGE-WAZA (standing throwing techniques)

- Learning the fundamental positions (SHIZEN-TAI);
- Learning motion on the mat (SHINTAI);

- Developing a "mat" sense;
- Developing a sense for the opponent and the moments favorable for action and gripping (pushing-pulling – KUMI-KATA);
- Achieving self-ensuring capacity after different falls;
- Learning break-falls (UKEMI) backwards (USHIRO-UKEMI) and side falls (YOKO-UKEMI);
- Learning the technical procedures of throwing the partner, which require permanent contact with the partner (without releasing phase):
    - O-SOTO-GARI
    - KO-SOTO-GARI
    - TANI-OTOSHI
    - UKI-GOSHI
    - SUMI-GAESHI
    - SOTO-MAKI-KOMI
- ~ Learning some basic self-defense techniques.

From a theoretical point of view:

- ♦ Learning basic notions of individual hygiene and equipment hygiene;
- ♦ Learning general notions about judo (short historic overview, origins, development etc.);
- ♦ Acquiring knowledge about breathing and its importance.

From a psychological point of view:

- ~ Cultivating the wish and pleasure of practicing judo;
- ~ Developing courage and perseverance in practicing judo.

Conclusion

Through its elaboration and materialization and by tackling the goals of training planning – conclusions drawn from this project – the paper constitutes a personal contribution of the authors with the possibility of subsequent publication in order to support those, who want to address this delicate subject: recuperation and social integration of vision impaired people by practicing judo.

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THE ANTIDEPRESSANT ROLE OF PHYSICAL EXERCISE

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ABSTRACT. Depression is considered to be the most frequent mental disorder and is encountered in medical practice in all specialties. Depression is an affective disorder characterized by a change in mood. The etiopathogeny of depression is very complex. Physical exercise plays many roles: sanogenic; anti-aging, prolongevity and active longevity; diagnostic; therapeutic; economic benefits. The antidepressant role of physical exercise has been evidenced in many researches. The current data regarding the paradoxical effect of physical exercise, as a prooxidant at high intensity and as an antioxidant at moderate intensity for a prolonged duration, pose the problem of its antidepressant effect. Through its antioxidant role, physical exercise can also be recommended in antidepressant therapy, which may be associated with drug therapy.

Key words: depression, physical exercise, etiopathogeny of depression**,** the paradoxical effect of physical exercise, oxidative stress

REZUMAT. **Rolul antidepresiv al exerciţiului fizic**. Depresia este considerat a fi cea mai frecventa afecţiune mintală, ea fiind întâlnită în taote specialităţile practicii medicale. Depresia este o afecţiunie afectivă carecterizată prin schimbări de dispoziţie. Etiopatogenia depresiei este foarte complexă. Exerciţiul fizic are multe roluri: sanogenetic, anti înbătrânire, prolongevitate şi logevitate activă; diagnostic, terapeutic, economic. Rolul antidepresiv al exerciţiului fizic a fost evidenţiat in numeroase cercetări. Studii de actualitate privind efectul paradoxal al exerciţiului fizic de prooxodant la intensităţi mari şi antioxidant la intensităţi moderate pun şi problema rolului antidepresiv al acestuia. Datorită rolului antioxidant, exerciţiul fizic poate fi recomandat în terapia antidepresivă eventual asociat cu terapie medicamentoasă.

Cuvinte cheie: depresie, exerciţiu fizic, etiopatogenia depresiei, efectul paradoxal al exerciţiului fizic, stress oxidativ

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General considerations

Depression is considered to be the most frequent mental disorder and is encountered in medical practice in all specialties. Its prevalence is 25% for women and 12% for men over the entire life duration. The onset of major depressive disorder is in 50% of the cases between the age of 20 and 50 years, with a mean of 40 years. Recent epidemiological studies even report an onset age of 20 years. After the age of 50 years, the differences in prevalence decrease, the rate of depression being equal in the two genders (Prelipceanu 2011). The disease has been associated with suicide in a proportion of 10-15% (Chapman et al. 2008).

Depression is an affective disorder characterized by a change in mood. Major depressive disorder (mono- or unipolar depression) may take various forms: major depressive disorder with psychotic factors, melancholy, atypical depression, postpartum depression, recurrent depression, treatment-resistant depression, seasonal depressive disorder, and depressive disorder with catatonic factors (Prelipceanu 2011).

Etiopathogeny

The following have been incriminated in the etiopathogeny of depression:

- neuromediators;
- neuroendocrine axes, mainly the hypothalamic-pituitary-adrenal axis;
- neurotrophic factors;
- genetic factors;
- psychosocial stressing factors;
- cognitive distortions;
- nutritional deficiency.

1. The biochemical hypothesis

The small neuromediator molecules involved in the biochemistry of depression are:

- monoamines such as acetylcholine and serotonin (Chkhartishvili et al. 2011; Mchedlidze et al. 2011; Matsukawa et al. 2010; Olivier et al. 2008; Van den Hove et al. 2006; Jang et al. 2004);
- catecholamines such as dopamine and noradrenaline (He et al. 2012; Zhang et al. 2011; Mchedlidze et al. 2011; Breuer et al. 2008);
- amino acids such as glutamate, gamma-aminobutyric acid and glycine (Prelipceanu 2011; Shirayama et al. 2011; Feeney et al. 1993);
- galanin (Ye et al. 2007);
- nitric oxide (Ferreira et al. 2012).

2. The hypothesis of stress

Depression has been associated with a number of stressors that may cause the disease.

The stressors involve:

- the quantitative aspect of the stressing situation;
- the time factor: the accelerated rate of changes, with consequences on decision and execution, as well as the duration of strain: acute or chronic, interference with the periodicity of work and rest, the extent to which an individual can anticipate this duration;
- psychosocial factors.

Mental stress increasingly replaces physical stress. The human factor is considered to be responsible for its own inadaptation. The forms of stress associated with depression are those predominantly psychic or psychosocial (Prelipceanu 2011; Riga and Riga 2008; Derevenco et al. 1992).

3. The neuroendocrine hypothesis

This hypothesis is based on the activation/inhibition of neuroendocrine axes, initiated at the level of the hypothalamus:

- hyperactivity of the hypothalamic-pituitary-adrenocortical axis (Gelfo et al. 2012; Liu and Zhou 2012);
- diminution of the activity of the hypothalamic-pituitary-gonadal axis, of the activity of the hypothalamic-pituitary-thyroid axis and STH secretion (Walf and Frye 2005; Grippo et al. 2005).

4. The cognitive hypothesis

Depression is considered to be a consequence of cognitive distortions, "automatic negative thoughts": negative self-perception, the tendency to perceive the exterior world as hostile, and expectation of future suffering and insuccess of which the patient is aware and which determine self-restrictive behavioral patterns, with a cognitive and emotional deficit (Prelipceanu 2011; Yilmaz et al. 2011; Gao et al. 2009; Henningsen et al. 2009; Teskey et al. 2007; Naudon and Jay 2005).

5. The neurotrophic hypothesis

It is based on neurodegenerescence through the reduced effect of neurotrophic factors (NGF – nerve growth factor, neurotrophins; BDNF – brain-derived neurotrophic factor), which decrease in depression and cause hippocampal atrophy, decreased synaptic plasticity, decreased neurogenesis and gliogenesis (Yang et al. 2012; Kaae et al. 2012; Hemanth Kumar et al. 2012; Ye et al. 2011; Nowak et al. 2010; Fortunato et al. 2009; Song et al. 2009; Huston et al. 2009; Allaman et al. 2008; Jayatissa et al. 2006).

6. The hypothesis of nutritional deficiencies

Depression has been correlated with vitamin nutritional deficiencies (vitamin B_2, vitamin B_6, vitamin B_{12} and folic acid), omega-3 fatty acids and a tryptophan deficient diet (Yang et al. 2012).

7. The hypothesis of the disturbance of mineral homeostasis

Depression has been associated with the excess of Zn and heavy metals: Al, Pb, Hg (Cope et al. 2011; Brocardo et al. 2007; Null and Feldman 1995).

8. The hypothesis of seasonal variations

The absence of sun exposure and the winter season have been related to depressive syndromes (Friedman et al. 2011; Goldman et al. 2009).

9. The genetic hypothesis

Molecular genetic studies provide arguments regarding the implication of the short arm of chromosome 11 and possibly, chromosome X in depression.

The hypothesis is based on the 2-3-fold increased frequency of depression in the first degree relatives of patients and on the 50% concordance of the disease in monozygotic twins (Prelipceanu 2011).

Roles of physical exercise

Physical exercise plays many roles: sanogenic; anti-aging, prolongevity and active longevity; diagnostic; therapeutic; economic benefits (Bruja et al. 2013).

The beneficial effects of moderate exercise on immunity have been evidenced in young people compared to elderly; in patients infected with HIV; in patients with certain types of cancer; in chronic fatigue syndrome; in space flights (Tache and Boboş 2011).

Physical exercise has beneficial effects of normalizing glycemia in type 2 diabetic patients; beneficial effects of stimulating antioxidant mechanisms in case of moderate intensity and duration exercise; it plays a role in functional recovery after sports and other traumas (injuries); in locomotor disorders (kinesiotherapy); treatment of mental diseases, neuroses (depresssion, schizophrenia, anxiety), diabetes, coagulation disorders and fibrinolysis, dyslipidemia, cardiovascular disorders (coronary disease, hypertension) (Sbenghe 1999).

The antidepressant role of physical exercise has been evidenced in researches on:

- human subjects, patients with various forms of depression (Matthews et al. 2011; Franco et al. 2010; Weber and Edwards 2010; O'Connor 2007; Liu 2009; Krogh et al. 2009; McKercher et al. 2009; Blumenthal et al. 2007; Leppämäki et al. 2004; Conn 2010);
- rodents with induced depression (Dimatelis et al. 2012; He et al. 2012; Hendriksen et al. 2012; Sigwalt et al. 2011; Marais et al. 2009; Garza et al. 2004; Russo-Neustadt et al. 2000).

The antidepressant action mechanisms of physical exercise can be explained by:

- the increase of post-training brain serotonin levels (Dey et al. 1992);
- the increase of the level of brain tryptophan, a serotonin precursor (Soares et al. 2003);
- prevention of the decrease in serotonin and noradrenaline levels and restoration of dopamine levels (He et al. 2012);
- the mediator role of the macrophage migration inhibitory factor in the alteration of serotonin neurotransmission and in the induction of brain neurogenesis through the neurotrophic factor (Moon et al. 2012);
- the role of lactate for the alteration of fatty acid metabolism, partly mediated through the activation of the transforming growth factor in moderate intensity exercise (Yamada et al. 2012);
- the role in the hyporegulation of the functional level of proteins in the hippocampus, which is hyperregulated in animal depression models, through the early separation of the offspring from their mothers (Dimatelis et al. 2012);
- the increase in the level of neurotrophic factors (brain derived neurotrophic factor – BDNF) in the striated bodies and the hippocampus and the increase of neuronal plasticity (Marais et al. 2009; Garza et al. 2004);
- the implication of the pathways of phosphatidylinositol 3' kinase (PI-3K), mitogen-activated protein kinase (MAPK), and cyclic adenosine monophosphate (cAMP) in neuroprotection at hypothalamic level (Yang et al. 2012).

Conclusions

The current data regarding the paradoxical effect of physical exercise (Tache and Ciocoi-Pop 2013), as a prooxidant at high intensity and as an antioxidant at moderate intensity for a prolonged duration, pose the problem of its antidepressant effect. Oxidative stress has been involved in the pathogenesis of more than 100 diseases, including depression (Tache 2000).

The antidepressant role of physical exercise in depression could be explained through its antioxidant effect: by the stimulation of antioxidant defense mechanisms at muscular level, through the nuclear factor kappa B (NF-kappaB) and mitogen-activated protein kinase (MAPK), and by the stimulation of the secretion of serotonin and its precursors, having in their turn an antioxidant role, and through the MAPK pathway with a neuroprotective effect.

Through its antioxidant role, physical exercise can also be recommended in antidepressant therapy, which may be associated with drug therapy.

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ORGANIZED PHISICAL ACTIVITIES INFLUENCE ON PRESCHOOL CHILDREN'S BMI

ANCA LUCIA VĂDAN[1] & MELANIA CÂMPEANU[1]

ABSTRACT. *Background.* Physical development is a dynamic action with multifactorial determination that depends on hereditary heritage, environmental features and other factors such as food quality, the usual daily bodily activities and organized physical activities, living conditions (housing, income, educational level, level of granted care, etc). *Aims.* The influence of organized physical activities on 7 years old preschool children's BMI was studied. *Matherials şi methods.* Fourty-eight (48) 7 years old children from Cluj-Napoca, participating in a physical activities focused Sommer School, were divided into 4 groups as follows: Group B(OPhA) – boys who have practiced for at least one year, at least twice a week, organized physical activities, n =16; Group B – boys who have not practiced organized physical activities, n =12; Group G(OPhA) - girls who have practiced for at least one year, at least twice a week, organized physical activities, n =10; Group G –girls who have not practiced organized physical activities, n =10. Height and weight were evaluated, than body mass index was calculated. *Results.* Significant lower BMI value was found in Group G(OPhA) compared to Group G. In Group B(OPhA), 12.5% of the boys were overweight and 6.25% were obese; in Group B, 25% of the boys were overweight and 25% were obese; in Group G(OPhA), there were no overweight or obese girls; in Group G, 20% of the girls were overweight and 10% were obese. *Conclusions.* Practicing organized physical activities determined highly significant lower BMI in girls groups; practicing organized physical activities did not influence BMI in boys groups.

Key words: preschool children, BMI, organized phisical activities.

REZUMAT. *Introducere.* Dezvoltarea fizică este o acţiune dinamică, cu determinare multifactorială, care depinde de patrimoniul ereditar, particularităţile de mediu şi de o serie de factori cum sunt: calitatea alimentaţiei, nivelul activităţilor corporale zilnice uzuale şi al ativităţilor fizice organizate, condiţii de viaţă (locuinţă, venituri, nivel educaţional, nivel de îngrijire acordat etc). *Obiective.*

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S-a studiat influenţa activităţilor fizice organizate asupra indicelui de masă corporală la copii preşcolari, cu vârsta de 7 ani. *Materiale şi metode***.** La acest studiu au participat 48 copii cu vârsta de 7 ani care au fost împărţiţi în 4 loturi, după cum urmează: Lotul B(OPhA) – băieţi care practicau de cel puţin un an, de cel puţin 2 ori pe săptămână, activităţi fizice organizate, n =16; Lotul B - băieţi care nu practicau activităţi fizice organizate, n =12; Lotul G(OPhA) - fete care practicau de cel puţin un an, de cel puţin 2 ori pe săptămână, activităţi fizice organizate, n =10; Lotul G - fete care nu practicau activităţi fizice organizate, n =10. Parametrii somatometrici luaţi în considerare sunt: greutatea şi talia, pe baza cărora s-a calculat indicele de masă corporală. *Rezultate.* Valoarea indicelui de masă corporală este înalt semnificativ mai mică pentru grupul de fete care practică activităţi fizice organizate, faţă de grupul care nu practică activităţi fizice organizate (p=0.002). In Grupul B(OPhA), 12.5% dintre băieţi sunt supraponderali şi 6.25% sunt obezi; în Grupul B, 25% dintre băieţi sunt supraponderali şi 25% sunt obezi; în Grupul G(OPhA) nu sunt fete supraponderale sau obeze; în grupul G, 20% dintre fete sunt supraponderale şi 10% sunt obeze. *Concluzii:* În grupul de fete care practică activităţi fizice organizate, indicele de masă corporală este înalt semnificativ mai mic decât în grupul fetelor care nu practică activităţi fizice organizate; practicarea activităţilor fizice organizate nu a influenţat valoarea inicelui de masă corporală în rândul băieţilor.

Cuvinte cheie: preşcolari, IMC, activitate fizică organizată.

Background

This paper is part of a larger study on growth parameters and physical development of school and preschool age children. Physical development is a dynamic action with multifactorial determination that depends on hereditary heritage, environmental features and other factors such as food quality, the usual daily bodily activities and organized physical activities, living conditions (housing, income, educational level, level of granted care, etc.)

Aims

The influence of organized physical activities on 7 years old preschool children's BMI was studied.

Matherials şi methods

Forty-eight (48) 7 years old children from Cluj-Napoca were evaluated. 28 were boys and 20 were girls.

a) Groups

Groups were divided as follows:

Group B(OPhA) – 7 years old boys who have practiced for at least one year, at least twice a week, organized physical activities, n =16;

Group B – 7 years old boys, who have not practiced organized physical activities, n =12;

Group G(OPhA) - 7 years old girls who have practiced for at least one year, at least twice a week, organized physical activities, n =10;

Group G – 7 years old girls who have not practiced organized physical activities, n =10.

b) Methods

Height and weight were evaluated, rigorously following the measurement methodology (Ionescu, 1994). Measurements were scheduled between 8-12 am, in order to avoid diurnal variations of height. Students were scantily clad and barefoot.

Body mass index (BMI) was obtained by calculating BMI value as follows:

BMI = Weight (kilograms)/ Height^2 (meters). Normal values for 7 years old children are between 13.7 kg/m^2 and 17.4 kg/m^2 for boys and between 13.4 kg/m^2 and 17.6 kg/m^2 for girls; BMI's values between 17.4 kg/m^2 and 19.1 kg/m^2 for boys and between 13.6 kg/m^2 and 19.7 kg/m^2 for girls means overweight; BMI's values higher than 19.1 kg/m^2 for boys and 19.7 kg/m^2 for girls means obesity (www.cdc.gov).

Statistical analysis was performed with Microsoft Excel 2007. Significance threshold was set at $p<0.05$.

Results

Significant lower BMI value was found in Group G(OPhA) compared to Group G (Table 1, Fig. 1).

Table 1.

Comparative statistical analysis of BMI in boys and girls

Groups	Mean	Std. dev.	p
Group B(OPhA)	15.92	1.67	0.14
Group B	17.21	2.41	
Group G(OPhA)	14.80	0.91	0.002
Group G	17.12	1.62	

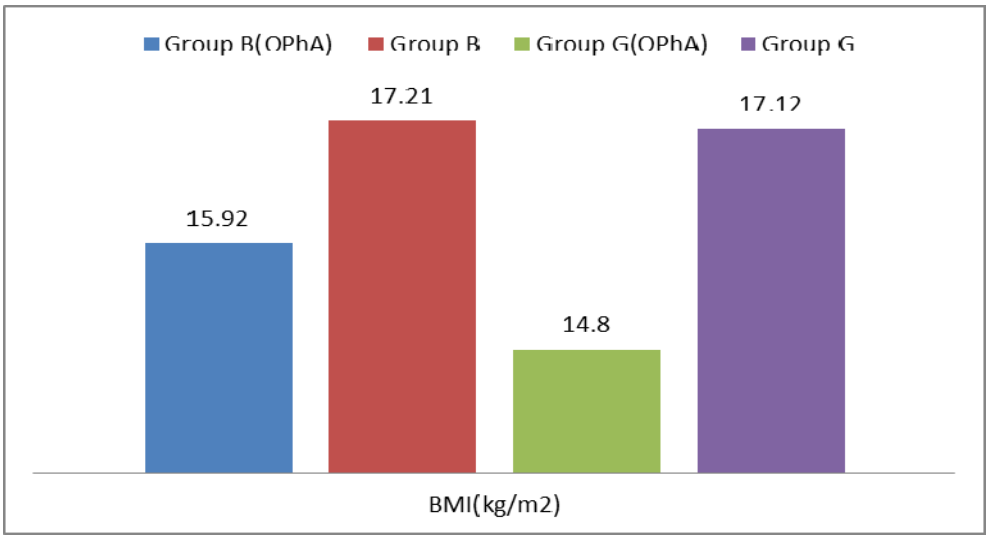

Fig. 1. BMI in boys and girls groups

In Group B(OPhA), 12.5% of the boys were overweight and 6.25% were obese; in Group B, 25% of the boys were overweight and 25% were obese; in Group G(OPhA), there were no overweight or obese girls; in Group G, 20% of the girls were overweight and 10% were obese (Fig. 2).

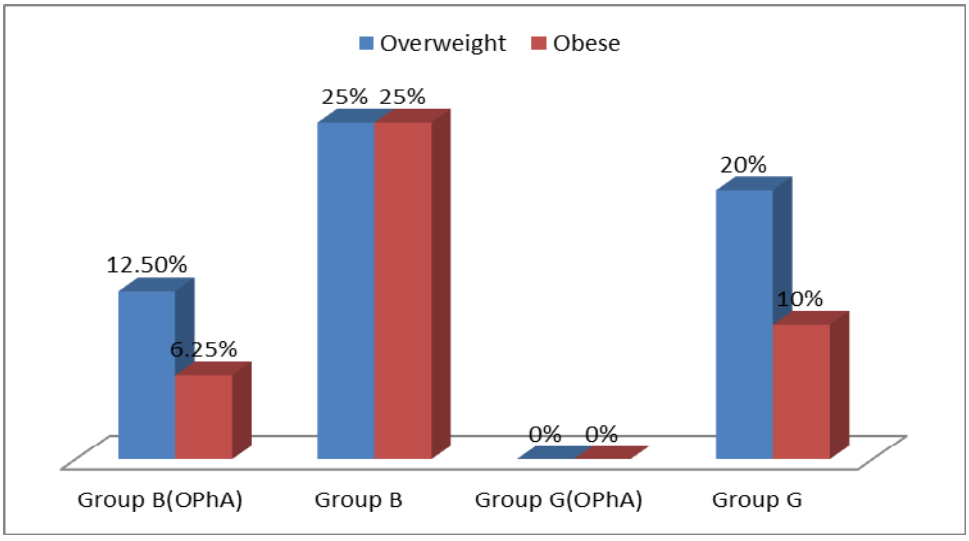

Fig. 2. Percentage of overweight and obese subjects in each group

Discussion

Childhood obesity has become a global public health issue, therefore researches are conducted in order to identify its determinants in different populations. After extensive research, several factors that influence physical development of children were identified. Among these factors, physical activity and organized physical activity are playing a very important role.

Obesity prevalence among school children in Cluj-Napoca city is 8.29% and overweight prevalence is of 12.84% placing Romania as one of the countries with an average prevalence of obesity, being significantly greater in males than in females for both overweight and obesity. The highest prevalence is among the 6-10 years group, and the lowest prevalence among teenagers (Vălean et al., 2009).

Our study, as shown in Fig.2, reveals similar results: the prevalence of overweight and obese children is higher among boys than girls. However, the BMI is not significantly higher in Group B, compared to Group B(OPhA) ($p=0.14$) and is highly significant lower in Group G(OPhA) compared to Group G ($p=0.002$). A Danish study among primary school children shows that significant lower participation in club sports did not affect overall physical activity level (Nielsen et al., 2013). This may be the situation in our case, if we consider the fact that the subjects in this study were participating in a physical activities focused Summer School.

We intent to continue the researches started in this study in order to identify the influence of the other factors (parents education level, family income, parents BMI, physical activities, eating patterns, screen-time) on preschool children's BMI.

Socio-economic status (SES) is one of the many factors that influence the child's physical development. Thibault et al. (2012) demonstrated that low SES is associated with a higher risk of being overweight or obese. These findings are sustained by Lane et al. (2012), while a study from Belarus shows that more affluent children and their fathers were more likely to be overweight/ obese but the reverse was found for mothers (Patel et al., 2012) and other study from Iran shows a higher prevalence of obesity in the children with good socio-economic status and a positive relationship between usage of fast food and obesity (Behzadnia et al., 2012).

Further more, some factors that influence physical development are determined by SES. Thereby, low SES children have lower physical activities levels, higher BMI and spend more time in sedentary behavior, compared to high SES children (Drenowatz et al., 2010). Magnusson et al. (2011) highlights that

eating breakfast and vegetables and physical activity were higher and screen-time(watching TV and playing computer games) and obesity prevalence was lower in high SES children, compared to low SES children. Wang et al. (2012) concluded that excessive TV viewing might increase the risk of obesity among Chinese youth.

Nutritional patterns and its influence on children's physical development were also studied by Weijs et al. (2011), who concluded that a high intake of sugar containing beverages as well as animal protein in the first year of life may increase the risk of overweight at 8 years. Inactivity (watching TV and playing computer games) was inversely associated with "healthy patterns" in all age and sex groups and positively associated with "unhealthy snacks" (Craig et al., 2010).

Parents are responsible not only for the genetic inheritance of their children, but also for passing onto them their behaviors and attitudes toward life. Thereby, parent's obesity seem to influence the prevalence of overweight and obesity in children (Lazzeri et al., 2011). Normal BMI status of the parents seemed to have a protective effect on the likelihood of having an overweight/ obese child (Farajian et al., 2012). Juresa et al. (2012) describes a overweight/ obese child profile: high educated parents, eat less vegetables and fruits, spend more time playing computer games, have less physical activity. A study conducted among Polish children concluded that parents educational level influence child's physical development (Suliga, 2010). Thereby, interventional plans conducted in order to reduce BMI and increase physical activity level were more successful among children with degree level educated parents (Au & Yu, 2012) and among children of high SES families (Plachta-Danielzik et al., 2011).

Conclusions

1. Practicing organized physical activities determined highly significant lower BMI in girls groups

2. Practicing organized physical activities did not influence BMI in boys groups.

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*** http://www.cdc.gov/growthcharts/data/set2/chart-15.pdf

*** http://www.cdc.gov/growthcharts/data/set2/chart-16.pdf

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INFLUENCE OF PHYSICAL EXERCISE ON MOTOR BEHAVIOR IN EXPERIMENTALLY INDUCED DEPRESSION (NOTE I)

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ABSTRACT. Depression, studied over the past 50 years in animal models with genetic or experimentally induced depression, is associated with locomotor, anxiety, motor learning and memory changes. We aimed to study in animals, male Wistar rats, in which depression was experimentally induced, the antidepressant effect of exercise on locomotor, exploratory and emotional behavior. The performance of physical exercise in animals with induced depression and the improvement of locomotor activity evidenced by us were reported by other authors (Hendriksen et al. 2012; Van Hoomissen et al. 2011). The insignificant changes of emotivity in experimental depression are not influenced by physical exercise. Physical exercise has favorable effects on motor behavior, does not influence emotivity and has antidepressant effects in animals with olfactory bulbectomy induced depression, a model that mimics major depression in humans.

Keywords: physical exercise, depression, motility, emotivity.

REZUMAT. Influenţa efortului fizic asupra comportamentului motor în depresia indusă experimental (Nota I). Depresia, studiată în ultimii 50 ani, pe modele animale genice sau cu depresie indusă experimental, este asociată cu modificări locomotorii, de anxietate, de învăţare motorie şi de memorie. Ne-am propus să studiem efectul antidepresiv al efortului asupra comportamentului locomotor, explorator şi emoţional. Ne-am propus să studiem pe animale, şobolani masculi rasa Wistar, la care s-a indus experimental depresia, efectul antidepresiv al efortului asupra comportamentului locomotor, explorator şi emoţional. Efectuarea efortului fizic la animale cu depresie indusă şi îmbunătăţirea activităţii locomotorii evidenţiată de noi, a fost semnalată şi de alţi autori (Hendriksen ş.c. 2012; Van Hoomissen ş.c. 2011). Modificările nesemnificative ale emotivităţii în depresia experimentală nu sunt influenţate de efortul fizic. Efortul fizic are efecte favorabile asupra comportamentului motor, nu influenţează emotivitatea şi are efecte antidepresive la animale cu depresie indusă prin bulbectomie olfactivă, model care simulează depresia majoră la om.

Cuvinte cheie: efort fizic, depresie, motilitate, emotivitate

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Introduction

Depression, studied over the past 50 years in animal models with genetic or experimentally induced depression, is associated with locomotor, anxiety, motor learning and memory changes.

Locomotor behavior changes in depression have been studied particularly in models of olfactory bulbectomy induced depression (Takahashi et al. 2011; Romeas et al. 2009; Gao et al. 2009; Roche et al. 2008; Mchedlidze et al. 2011) and less in models of olfactory bulbectomy induced depression and exercise (Van Hoomissen et al. 2011; Hendriksen et al. 2012).

Objectives

We aimed to study in animals, male Wistar rats, in which depression was experimentally induced, the antidepressant effect of exercise on locomotor, exploratory and emotional behavior.

Material and methods

The research was performed in male Wistar rats aged 4 months, with a weight of 200-250 g, from the Biobasis of the "Iuliu Haţieganu" University of Medicine and Pharmacy Cluj-Napoca. The studies were carried out in the Experimental Research Laboratory of the Department of Physiology, with the approval of the Bioethics Board.

Groups (n = 10 animals/group)

- group C – control group of males
- group I – males with depression
- group II – males with depression, subjected to an exercise test through the swimming test (1 hour daily for 28 days)

Behavior testing methods

- The tail suspension test – TST as an alternative to the forced swimming test (adaptation of Steru et al. 1985) for determining antidepressant activity based on the immobility time, expressed in seconds;
- The open field test (OFT) according to Denenberg and Whimby (1963) for testing spontaneous motility based on the motility score (sum of transitions/excursions) and emotivity based on the emotional score (sum of micturitions and defecations expressed in absolute values).

Examination moments: T_1 (day 1) and T_{28} (day 28)

a. Depression was induced using the Kelly method (1987) through bilateral olfactory bulbectomy
b. OFT at T_1 and T_{28}
c. Daily physical exercise – the pool swimming test after day 7 postoperatively

Statistical analysis

Statistical processing was performed with the Excel application (Microsoft Office 2007) and the StatsDirect v.2.7.2 software. The results were graphically represented using the Excel application (Microsoft Office 2007).

Results

The statistical analysis of the **TST test** values, *considering all groups*, evidenced highly statistically significant differences between at least two of the groups both at moment T_1 ($p = 1.31 \times 10^{-16}$) and at moment T_{28} ($p = 2.09 \times 10^{-18}$).

The statistical analysis of the **open field test** values **– emotional score,** *considering all groups,* evidenced no statistically significant differences between any of the groups, at moment T_1 ($p = 0.8309$) or at moment T_{28} ($p = 0.4021$).

The statistical analysis of the **open field test** values **– motility score,** *considering all groups,* evidenced highly statistically significant differences between at least two groups both at moment T_1 and at moment T_{28} ($p < 0.0001$).

The statistical analysis of the values of the studied indicators **for unpaired samples (group C – group I)**, showed:

- for the TST test
  - highly statistically significant differences between the two groups at moments T_1 and T_{28} ($p < 0.001$)
- for the open field test
  - differences without statistical significance in the *emotional score* values between the two groups at moments T_1 and T_{28} ($p>0.05$)
  - highly statistically significant differences in the *motility score* values between the two groups at moments T_1 and T_{28} ($p < 0.001$)

The statistical analysis of the values of the studied indicators **for unpaired samples (group C – group II)** showed:

- for the TST test
  - highly statistically significant differences between the two groups at moments T_1 and T_{28} ($p < 0.001$)
- for the open field test
  - differences without statistical significance in the *emotional score* values between the two groups at moments T_1 and T_{28} ($p > 0.05$)
  - highly statistically significant differences in the *motility score* values between the two groups at moments T_1 and T_{28} ($p < 0.001$)

The statistical analysis of the values of the studied indicators **for unpaired samples (group I – group II)** showed:

- for the TST test
  - highly statistically significant differences between the two groups at moment T_{28} ($p < 0.001$)
- for the open field test
  - differences without statistical significance in the *emotional score* values between the two groups at moments T_1 and T_{28} ($p > 0.05$)
  - highly statistically significant differences in the *motility score* values between the two groups at moment T_{28} ($p < 0.001$)

The statistical analysis of the values of the studied indicators **for paired samples (moments T_1 – T_{28} in group I)** showed:

- for the TST test
  - highly statistically significant differences between the two moments ($p < 0.001$)
- for the open field test
  - differences without statistical significance in the *emotional score* as well as the *motility score* values ($p > 0.05$)

The statistical analysis of the values of the studied indicators for **paired samples (moments T_1 – T_{28} in group II)** evidenced:

- for the TST test
  - highly statistically significant differences between the two moments ($p < 0.001$)
- for the open field test
  - differences without statistical significance in the *emotional score* values ($p > 0.05$)
  - highly statistically significant differences between the two moments in the *motility score* values ($p < 0.001$)

Table I.

Comparative analysis for the values of the studied indicators in the two groups and statistical significance

Test				Mean	SE	Median	SD	Min.	Max.	*Statistical significance (p)* Unpaired samples	
										group C – group I	group C – group II
CONTROL GROUP	TST test	tail suspension	T_1	9.3	0.4726	9	1.4944	7	12	**7.46×10^{-12}**	**7.92×10^{-12}**
			T_{28}							**1.6×10^{-10}**	**2.78×10^{-12}**
	Open field test	emotional score	T_1	9.2	0.7424	10	2.3476	5	12	0.5975	0.8154
			T_{28}							0.2492	0.4755
		motility score	T_1	20.1	0.6904	20	2.1833	17	23	**2.63×10^{-9}**	**7.77×10^{-10}**
			T_{28}							**< 0.0001**	**0.0003**
			T_{28}							**0.0003**	**< 0.0001**
		excursions	T_1	2.93	0.0562	2.92	0.1776	2.67	3.33	**< 0.0001**	0.0754
			T_{28}							**6.67×10^{-11}**	**< 0.0001**
		time in D	T_1	3.58	0.1369	3.63	0.4329	2.83	4.17	**< 0.0001**	**< 0.0001**
			T_{28}							**3.66×10^{-16}**	**1.49×10^{-17}**
		latency time	T_1	32.28	0.6745	32.67	2.1330	26.92	34.75	**< 0.0001**	**< 0.0001**
			T_{28}							**< 0.0001**	**< 0.0001**
			T_{28}							0.33	0.5196
		excursions	T_1	10.5	0.6540	10	2.0683	8	14	**< 0.0001**	**< 0.0001**
			T_{28}							**< 0.0001**	**< 0.0001**
		time in D	T_1	32.2	2.5465	33.5	8.0526	18	42	**< 0.0001**	**0.0015**
			T_{28}							0.0006	**0.0086**
		latency time	T_1	60		60		60	60	–	–
			T_{28}							–	–
										group I – group II	
GROUP I	TST test	tail suspension	T_1	19.5	0.3416	19.5	1.0801	18	21	**0.8620**	
			T_{28}	45.7	1.5567	46	4.9227	38	52	**5.89×10^{-8}**	
	Open field test	emotional score	T_1	8.7	0.5588	8	1.7670	6	12	0.6668	
			T_{28}	8.1	0.5467	8.5	1.7288	5	11	0.4494	
		motility score	T_1	9.8	0.3590	10	1.1353	8	12	0.3565	
			T_{28}	10.4	0.3399	10.5	1.0750	8	12	**< 0.0001**	
			T_{28}	5.4	0.3399	5	1.0750	4	7	0.0533	
		excursions	T_1	3.4	0.2211	3.5	0.6992	2	4	**0.01**	
			T_{28}	6.5	0.3727	7	1.1785	5	8	0.9091	
		time in D	T_1	16.6	0.7630	17.5	2.4129	12	19	**0.0186**	
			T_{28}	19.2	0.6110	18.5	1.9322	17	22	**0.0002**	
		latency time	T_1	60		60		60	60	–	
			T_{28}	60		60		60	60	–	
										Paired samples ($T_1 - T_{28}$)	
										group I	group II
GROUP II	TST test	tail suspension	T_1	19.4	0.4522	19	1.4298	17	22	**9.14×10^{-8}**	**1.26×10^{-6}**
			T_{28}	26.8	0.7272	27	2.2998	23	30		
	Open field test	emotional score	T_1	9	0.3944	9	1.2472	7	11	0.3288	0.4945
			T_{28}	8.6	0.3399	9	1.0750	7	10		
		motility score	T_1	9.1	0.6403	9.5	2.0248	6	12	0.3125	**1.28×10^{-5}**
			T_{28}	16.3	0.3958	16	1.2517	14	18		
			T_{28}	4.5	0.2687	4.5	0.8498	3	6		
		excursions	T_1	4.9	0.4583	4.5	1.4491	3	8	**0.002**	**0.0391**
			T_{28}	6.5	0.3727	7	1.1785	5	8		
		time in D	T_1	20.7	1.4610	20.5	4.6200	13	30	**0.0234**	**0.0469**
			T_{28}	23.6	0.7024	23.5	2.2211	19	27		
		latency time	T_1	60		60		60	60	–	–
			T_{28}	60		60		60	60		

Table II.

Statistical correlation analysis between the values of the TST and the open field test in the two groups

Indicator \ Group	Group C		Group I (T_1)		Group I (T_{28})		Group II (T_1)		Group II (T_{28})	
tail suspension – emotional score	-0.1457	*	0.2038	*	0.3825	**	-0.1246	*	-0.2157	*
tail suspension – motility score	0.4271	**	0.4531	**	0.6321	***	-0.9364	****	-0.2856	**
emotional score – motility score	0.7072	***	0.5206	***	0.8651	****	-0.0880	*	0.2643	**

For **group C**, the statistical correlation analysis between the values of the studied indicators evidenced:

- a good and positive correlation between the emotional score and the motility score
- an acceptable and positive correlation between tail suspension and the motility score

For **group I,** the statistical correlation analysis between the values of the studied indicators showed:

- at moment T_1
  - a good and positive correlation between the emotional score and the motility score
  - an acceptable and positive correlation between tail suspension and the motility score.
- at moment T_{28}
  - a very good and positive correlation between the emotional score and the motility score
  - a good and positive correlation between tail suspension and the motility score
  - an acceptable and positive correlation between tail suspension and the emotional score.

For **group II,** the statistical correlation analysis between the values of the studied indicators evidenced:

- at moment T_1
  - a very good and negative correlation between tail suspension and the motility score
- at moment T_{28}
  - an acceptable and negative correlation between tail suspension and the motility score
  - an acceptable and positive correlation between the emotional score and the motility score.

Discussions

Our results show that bilateral olfactory bulbectomy is a valid model of depression induced in rats, immobility being the proof of depressant activity. TST values significantly increased in groups I and II compared to group C at moments T_1 and T_{28} and at moment T_{28} compared to moment T_1. TST values were maximal at moment T_{28} in group I. Physical exercise determined a decrease in the immobility time, TST values at moment T_{28} were significantly decreased in group II compared to group I.

The testing of involuntary motility through OFT showed significant decreases of the motility score in groups I and II compared to group C, at moments T_1 and T_{28}. The motility score significantly increased in group II, subjected to exercise, at moment T_{28} compared to group I, and significantly increased in the same group at moment T_{28} compared to moment T_1.

The emotional score insignificantly decreased in groups I and II compared to group C and insignificantly increased in group II at moment T_{28} compared to group I.

Our results are in accordance with the data of other authors regarding the decrease of locomotor and exploratory behavior and the increase of immobility in animals with induced depression (Che et al. 2013; Tasset et al. 2010; Husain et al. 2011; Shaw et al. 2009; Wang et al. 2009; Romeas et al. 2009).

The performance of physical exercise in animals with induced depression and the improvement of locomotor activity evidenced by us were reported by other authors (Hendriksen et al. 2012; Van Hoomissen et al. 2011).

The insignificant changes of emotivity in experimental depression are not influenced by physical exercise.

Conclusions

1. Physical exercise has favorable effects on motor behavior, with the increase of the spontaneous motility score and the reduction of the immobility time in animals with bulbectomy induced depression.

2. Physical exercise does not influence emotivity, the emotional score undergoes insignificant changes in animals with bulbectomy induced depression.

3. Physical exercise has antidepressant effects in animals with olfactory bulbectomy induced depression, a model that mimics major depression in humans.

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