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## IMPROVING SELF-IMAGE IN OVERWEIGHT AND OBESE STUDENTS THROUGH THE SYSTEMATIC PRACTICE OF FITNESS, PILATES AND STRETCHING EXERCISES

Îmbunătățirea imaginii de sine la studentele cu surplus și exces ponderal prin practicarea sistematică a exercițiilor de fitness, Pilates și stretching

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**Rezumat.** *Lucrarea de față este rezultatul cercetării întreprinse în cadrul studiilor de doctorat și are ca subiect interpretarea răspunsurilor la itemii chestionarului ZKPQ (Zuckerman-Kuhlman) privind cele două scale ale personalității, sub raportul Activității și Sociabilității. În cadrul studiului, s-a verificat dacă există diferențe semnificative statistic între scorurile înregistrate la începutul studiului (înainte de efectuarea programelor de mișcare) și rezultatele obținute la finalul cercetării (după efectuarea programelor de pregătire fizică). Programele de exerciții fizice au fost aplicate unui grup experimental alcătuit din 25 de studente supraponderale și obeze din cadrul ASE București. Antrenamentele de pregătire au inclus exerciții combinate din fitness, Pilates și stretching, și s-au efectuat de 3 ori pe săptămână, cu durată de 60 de minute pentru fiecare ședință de lucru. În urma studiului efectuat, s-a constatat că practicarea sistematică a exercițiilor de fitness, Pilates și stretching poate conduce la creșterea încrederii în forțele proprii prin îmbunătățirea imaginii de sine.*

*Cuvinte-cheie: imagine de sine, exercițiu fizic, obezitate.*

**Abstract.** *This paper is the result of the research conducted during the author's PhD studies and focuses on the interpretation of responses to the ZKPQ (Zuckerman-Kuhlman) personality questionnaire regarding the two scales of personality, in terms of Activity and Sociability. Within the study, it has been checked whether there are statistically significant differences between the scores recorded at the beginning of this research (before performing the movement programmes) and the scores achieved at the end of the study (after completing the physical preparation programmes). Physical exercise programmes were applied to an experimental group made up of 25 overweight and obese female students from the Bucharest Academy of Economic Sciences. Training sessions included combined fitness, Pilates and stretching exercises and were performed 3 times a week, each session lasting 60 minutes. The conducted study has revealed that the systematic practice of fitness, Pilates and stretching exercises may lead to an increase in self-confidence, due to the improvement of self-image.*

*Keywords: self-image, physical exercise, obesity.*

### Introduction

Obesity represents one of the most serious problems that affect the health of modern human being. It “may lead, in most cases, to the deterioration of health state on the functional, psychological and social planes” (Bota and Teodorescu, 2007: 39). Consequently, obesity increases the risk for the emergence of many disorders, both physical and mental ones.

Due to the standards promoted by society through an aggressive advertising, the physical aspect, an important component of self-image, determines the young girls to adopt unbalanced diets that lead to depressive states or to the alternation between anorexia and bulimia, which makes them feel frustrated, with consequences on their self-confidence and self-esteem. Among the young girls who are overweight, but especially obese, the psychological problems generated by their physical aspect are also frequent and lead to the same “decrease in self-esteem and lack of self-confidence” (Pop, 2013: 60). Therefore, the only condition to reduce these psychic disorders is the practice of any kind of physical activity which, performed on a regular basis, is beneficial to the formation and maintenance of a strong psychic tone. At the same time, physical activities practiced outdoors or in the fitness gyms contribute to the socialization through movement, and through the movement effect, they contribute to the personality development and, last but not least, to the individual's involvement into the group, an occasion to create new relationships or an opportunity to improve the communication capacities.

### Purpose and hypothesis of the research

This research emphasizes the positive effect on the level of Activity and Sociability, obtained as a result of practicing the physical exercise programmes based on fitness, Pilates and stretching (FPS), which indicates the importance of physical preparation, with multiple influences on both the body and the personality development.

We started from the premise that the systematic practice of physical exercises in general, but especially of modern programmes of fitness, Pilates and stretching exercises, can positively influence the level of physical preparation and also the different dimensions of personality (Activity, Sociability), leading to the improvement of self-image in the overweight and obese female students.

## Materials and methods

*Research subjects.* Based on the calculation of body mass index, it was created an experiment group made up of 25 overweight and obese female students (12 overweight and 13 obese), with ages comprised between 18 and 25 years, selected from the different faculties of the Bucharest Academy of Economic Studies. The experiment group was applied some physical preparation programmes during three semesters, with a frequency of 3 sessions a week and a length of 60 minutes for each working programme put into practice.

*Research methods.* In order to achieve the study, the following research methods were used: analysis and generalisation of data provided by the specialty literature, pedagogic observation, questionnaire-based survey, measurement and assessment methods, experimental method, mathematical and statistical method, graphical and tabular methods.

To assess the general motor potential of the experiment group, there were measured four motor trials that aimed at the strength of abdominal muscles (trial 1), back muscles (trial 2), upper limbs (trial 3) and lower limbs (trial 4).

To prove the efficiency of physical exercise programmes based on fitness, Pilates and stretching, there were monitored the functional parameters (Ruffier test and vital capacity), the motor parameters (abdominal muscle strength, back muscle strength, strength of the upper and lower limbs) and the subjective parameters, by applying the ZKPQ personality questionnaire. This questionnaire, made up of 99 items, was used to assess the five factors necessary to describe the personality structure and required by the Alterantive Five-Factor Model (AFFM): Activity, Sociability, Anxiety, Aggression and Impulsive Sensation Seeking. The ZKPQ personality questionnaire was applied in the preliminary phase of the study, prior to the experimental programmes, as well as after their completion, by means of the computerized variant, in the Psychology Laboratory within the UNEFS Bucharest.

After performing the measurements and applying the ZKPQ personality questionnaire, the results obtained by the overweight and obese girls were processed, analysed and interpreted statistically and mathematically, using the following indicators: arithmetic mean ( $\bar{X}$ ), standard deviation (S), mean error (M), coefficient of variation (variability) ( $C_v$ ).

## Results

Within the study, it has been checked whether there are statistically significant differences between the scores achieved by the overweight and obese female students at the beginning of this research (before performing the movement programmes) and their scores at the end of the experimental intervention (after completing the movement programmes), under the aspects related to the two personality scales, namely Activity and Sociability.

Table 1. Results of the female participants (experiment group) – before and after the experimental intervention, for the two scales, Activity and Sociability

		N	Mean rank	Sum of ranks
<i>Sociability</i> before – after	Negative ranks	2	1.50	3.00
	Positive ranks	18	11.50	207.00
	Ties	5		
	Total	25		
<i>Activity</i> before – after	Negative ranks	4	7.50	30.00
	Positive ranks	16	11.25	180.00
	Ties	5		
	Total	25		

Table 2. Results of the participating female students (experiment group) – before and after the experimental intervention (Activity and Sociability)

Participating female students	Z	Asymp. Sig. (2-tailed)
Sociability before – after		.000
Activity before – after		.005

a. Based on negative ranks

b. Based on positive ranks

Application of the Wilcoxon test (Labár, 2008: 136) to process the statistical results obtained for the **Sociability** scale was made on the basis of negative ranks (rank 1 was attributed to the lowest value). The test value, in the case of girl students composing the experiment group, is 3.00. Because the calculated value is smaller than the tabulated critical value for the alpha level 0.05 and  $N = 25$  ( $3.00 < 89$ ), and  $p = 0.000$ , it can be concluded that there is a statistically significant difference between the scores recorded in the initial period of the study (Median = 10) and the results achieved after completing the physical preparation programmes (Median = 12). The effect size is  $r = 0.54$ , which emphasizes a strong effect of the performed movement programme on the **Sociability** level.

Female students belonging to the experiment group prefer to spend more time in society and prefer the group activities after completing the complex movement programmes purposely designed for them, as compared to the initial period (before the experimental intervention).

Statistical processing of the results achieved for the **Activity** scale was made using the Wilcoxon test, which was applied on the basis of negative ranks (rank 1 was attributed to the lowest value). The test value is 30 and, because the calculated value is smaller than the tabulated critical value for the alpha level 0.05 and  $N = 25$  ( $30 < 89$ ), and  $p = 0.005$ , it can be concluded that, in the case of overweight and obese female students belonging to the experiment group, there is a statistically significant difference between the scores recorded in the initial period of the study (Median = 9) and the results achieved after completing the FPS programmes (Median = 13), as regards the **Activity**. The effect size is  $r = 0.40$ , which emphasizes a moderate to strong effect of the movement programme on the **Activity** level.

Female students in the experiment group feel that they have more energy and are more willing to practice physical activities after completing the applied modern programmes, as compared to the initial period (before the experimental intervention).

In Fig. 2, it is shown, as an example, the box-plot graph for the **Activity** scale, after completing the combined fitness, Pilates and stretching programmes purposely designed for the overweight and obese girl students in the experiment group.

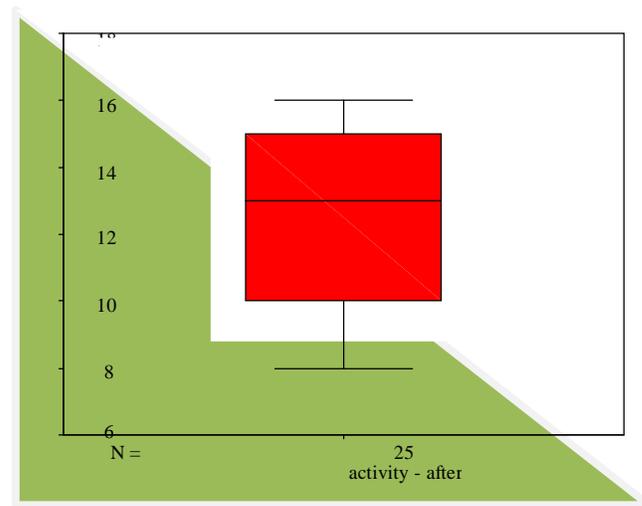


Fig. 1. Extreme values for the **Activity** scale after the experimental intervention (E.G.)

From the analysed statistical data, it has resulted that, in terms of **Activity** and **Sociability**, the significance threshold  $p$ -values are smaller than 0.05, which means that there are statistically significant differences between the results achieved at the initial testing (before the experimental intervention) and the scores recorded at the final testing, consequently the research hypothesis is accepted. This is translated by the fact that the female students in the experiment group, at the end of the complex fitness, Pilates and stretching programmes purposely designed for them, prefer the group activities, prefer to spend more time in society, have more energy, are more willing to practice physical exercises and are more self-confident, as compared to the initial period (before applying the physical preparation programmes).

Statistical indicators	Trial 1	Trial 1	Trial 2	Trial 2	Trial 3	Trial 3	Trial 4	Trial 4	Table 3.
	initial testing	final testing							
$\bar{X}$	12.28	16.20	16.20	19.92	10.16	12.68	17.72	22.24	
S	3.09	2.66	4.62	4.45	6.25	6.45	3.01	3.35	
M	0.62	0.53	0.92	0.89	1.25	1.29	0.60	0.67	
$C_v$	25.16	16.43	28.51	22.35	61.51	50.84	16.97	15.04	

Statistical indicators for the general motricity trials – initial and final testing

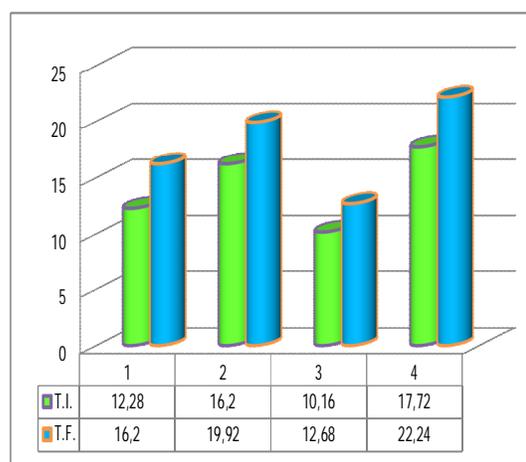


Fig. 2. A comparative analysis of the arithmetic means at the motor trials

As regards the physical fitness assessed through the general motricity trials, the independent t-test values indicate significant progress made by the experiment group between the two testing moments (initial and final testing), for all the 4 motor trials (trunk lifts from dorsal decubitus, trunk lifts from facial decubitus, upper limb strength, lower limb strength),  $p < 0.05$ , which confirms the research hypothesis.

## Conclusions

After applying some modern *fitness, Pilates and stretching* programmes within the physical preparation of female students in the experiment group, besides the physical component, it has also been improved the psychic component, respectively the personality-related one, the girls being stimulated to participate more actively and consciously in the instructive-educative process.

The personality profile of overweight and obese female students belonging to the experiment group proves that there are differences between the personality dimensions (Activity and Sociability) assessed initially (before applying the experimental programmes) and finally (after completing the experimental programmes), which means that, if systematically practiced, the *fitness, Pilates and stretching-type* exercises increase self-confidence, due to the improvement of self-image.

Results achieved within this research have led to the conclusion that modern physical exercise programmes (fitness, Pilates and stretching), if systematically performed, contribute to increasing the motor potential and influence positively and significantly the personality dimensions pursued (Activity and Sociability), having beneficial effects also on the psychosocial life of overweight and obese girl students.

### Discussions

The optimistic results achieved by the overweight and obese female students, who have worked systematically during the three semesters, highlight the necessity to include physical exercises in the lifestyle of each person with such problems, and not only, in order to maintain health over a long period of time and also to keep up an optimum physical and psychic fitness. Data analysis may extrapolate the future directions of action in the didactic process oriented towards the preparation of young people with weight problems, the teaching staff aiming to increase the attractiveness of physical education lessons, by implementing and developing some new preparation methods in the higher education, too.

### Acknowledgements

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## STUDY ON THE OPTIMIZATION OF TENNIS SPECIFIC MOVEMENT SKILLS FOR JUNIORS

Cercetări privind optimizarea elementelor de deplasare în teren specifice jocului de tenis, la nivelul juniorilor

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**Rezumat:** Diferitele forme de deplasare în teren reprezintă modalități prin care un jucător ajunge în situații de a executa procedee tehnice prin intermediul cărora să aplice acțiunea tactică sau să participe la combinația între doi și trei jucători prin care să valorifice particularitățile și caracteristicile sale, precum și lipsurile adversarului (Teodorescu, 1975: 26). Aplicarea setului de mijloace de pregătire elaborat ca urmare a procesului de evaluare obiectivă, determină un nivel superior de pregătire și conduce la obținerea unor rezultate mai bune. Pregătirea de bază s-a realizat, conform planificării, la Oradea, pe terenurile de la baza sportivă Sănătatea. Cercetarea s-a realizat în perioada septembrie 2009 – octombrie 2013. Lotul de subiecți supuși cercetării a fost alcătuit din doisprezece jucători de tenis, juniori, băieți, cu vârste cuprinse între treisprezece și șaisprezece ani, legitimați la Asociația Sportivă Sănătatea Oradea. Rezultatele obținute în urma colectării, ordonării și prelucrării datelor privind testarea inițială și cea finală sunt prezentate în tabelul nr. 1 și graficele nr. 1, 2 și 3. Analizând ratele de progres analizate, constatăm că în urma pregătirii pe baza programului propus, sportivii participanți la cercetare au înregistrat progrese în ceea ce privește rezultatele obținute.

*Cuvinte cheie:* tenis, deplasare specifică, evaluare, metodică

**Abstract:** The various forms of movement on the field represent the means by which one player reaches proper conditions to perform technical procedures for applying the tactical action or taking part in the combination between two and three players allowing the development of his/her peculiarities and characteristics, as well as benefiting from the opponent's faults (Teodorescu, 1975: 26). The appliance of training set means issued consequently to the objective assessment process governs a higher training level and leads to secure better results. The basic training was carried out, according to schedule, in Oradea, on the tennis course of Sănătatea Sports Club. The study has been performed during the month of September 2009 till October 2013. The subjects' batch undergoing research consisted of twelve tennis players, juniors, young boys, with an average age of thirteen to sixteen, legitimized with Sănătatea Oradea Sports Association. The results obtained sequent to data gathering, arrangement and treatment related to the initial and final testing are shown in table no. 1 and graphics no. 1, 2 and 3. Considering the analyzed progress rates, we ascertain that consequently to the suggested training program, the athletes subject to study have known progress as for the results obtained.

*Key words:* tennis, specific movement, evaluation, methodics

### Introduction

Among the model markers contributing to perform an effective training process it is included the primary and follow-up selection, the sportsman's training and motivation, the value and the opportunity of applied means, the training level, the trainer's experience and practical application, the performance of a proper assessment etc. (Nicu, 1993: 30). During competition, the assimilation level and the technique effective application capability plays a relevant role in achieving the game purpose and tasks (Colibaba and Bota, 1998: 90). The various forms of movement on the field represent the means by which one player reaches proper conditions to perform technical procedures for applying the tactical action or taking part in the combination between two and three players allowing the development of his/her peculiarities and characteristics, as well as benefiting from the opponent's faults (Teodorescu, 1975: 26). Considering their role within the domain of interest special literature, the field movements in tennis are approached in educational studies (Moise, 1984; Pețan, 2011), in methodology studies (Cristea and Năstase, 1979; Baciu and Moise, 2008; Moise and Doboși, 2003), or in brochures for the training of people practicing this sport (Segărceanu, 1989, *Tennis*, 1986; Cristea, 1977).

Nevertheless, consulting the domain special literature, we ascertained that there are few studies framing teaching, consolidation and improvement means as a result of their assessment following research and less as the result of acquired professional experience acting as an educational tutor or trainer.

**Purpose.** The effectiveness assessment of means related to the tennis specific movement elements improvement in the field for optimizing the juniors' training process.

**Hypothesis.** The appliance of training set means issued consequently to the objective assessment process governs a higher training level and leads to secure better results.

## Material and methods

The basic training was carried out, according to schedule, in Oradea, on the tennis course of Sănătatea Sports Club. The other activities were performed on planned stage places and according to the competition calendar in which the studied subjects took part.

The study has been performed during the month of September 2009 till October 2013. The subjects' batch undergoing research consisted of twelve tennis players, juniors, young boys, with an average age of thirteen to sixteen, legitimized with Sănătatea Oradea Sports Association, who took part in national and international official competitions.

Within our research for optimizing the training and the assessment of applied means, several training programs have been established (in line with the training period), that besides the movement technique on the field improvement aim at developing the mobility capability secure the progress of subjects' sporting performance. The said programs include non peculiar means, implemented from athletics, gymnastics etc. for explosive force improvement (the hexagon test), and the movement speed (the fan speed test) and for the tennis specific movement improvement (lateral run test). During the experiment, the following methods have been applied: the plyometric method, repeat method, lapse training method and besides for non peculiar means we have used game and contest specific means (with or without racket).

The theoretical basis of the study and the feedback related to certain aspects of the research relied on the scientific documentation.

The program application and means assessment were carried out within an experiment with one variable, by measurement before and after including the argument.

For measuring instrument to assess the acquirement level and the application effectiveness of the movement elements in the field, we have used three tests: "the lateral run", "the hexagon test" and "the fan speed test".

*Lateral run test.* The athlete, standing on the service line, facing the net, performs the lateral run to the doubles' line, reaching it with the foot, then, performs the lateral run towards the opposite side, till reaching the doubles' line, returning to the departure point.

*The hexagon test.* It is drawn a geometrical shape with six sides of 61 cm each, forming an angle of  $120^{\circ}$ . The player, placed in the centre of the hexagon, has to jump, in series, outside of each side and every time to return in the centre of the hexagon, as quickly as possible, on the departure point (Fig. 1).

*The fan speed test.* The performer has to move quickly, to pick and place in line with the departure point each of five balls, positioned on the field as shown in Fig. 2. The movement needs to be performed facing the movement direction, both on leave and return, except while pulling off after picking the ball from point no. 3, when the movement needs to be carried out backwards to the point where it needs to be placed.

The assessment of the obtained outcome has been performed by the assessment system (schedule and score) of Romanian Tennis Federation and of certain completions made by including the score "excellent" and the related schedule.

The treatment of obtained data during the study has been carried out by using the software Statistical Package for the Social Science (SPSS). For drawing the tables and graphic presentations we used Microsoft Excel software.

## Results

The results obtained sequent to data gathering, arrangement and treatment related to the initial and final testing are shown in table no. I and graphics no. 1, 2 and 3.

Table 1. Results obtained sequent to the initial and final testing

Nr.	Marker	Test		
		Lateral run (sec)	Fan speed (sec)	Hexagon (sec)
1	I.T. Average	7.75	18.77	12.42
2	F.T. Average	6.68	17.05	11.34
3	Dif. between I.T and F.T.	- 1.07	- 1.72	- 0.97
4	Effect range	1.49	1.63	0.80

5	Secured score	Weak	Average	Good
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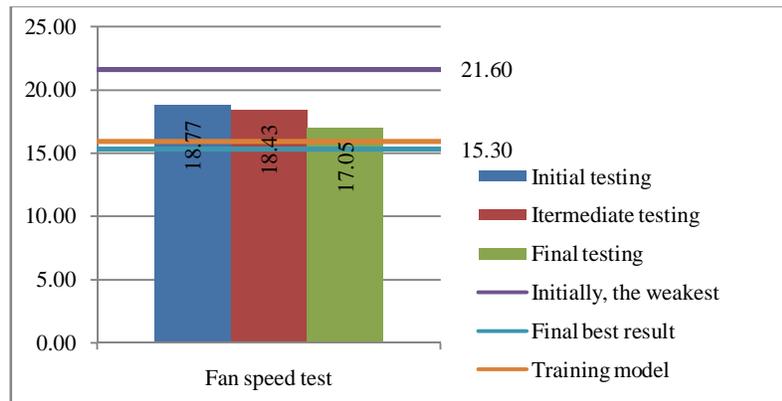


Fig. 1. Evolution for Fan speed test

Considering the analysis of the average results obtained upon the initial testing in comparison with the final testing, it issues that an improvement of performances has been achieved, 18.77 seconds is the average obtained upon the beginning of the testing, 18.43 seconds upon the intermediate testing, thus, eventually, the arithmetical average of the results of those undergoing the testing to be of 17.05 seconds. The effectiveness of the suggested training program is proved by the progressing average achieved of 1.60 seconds. Therefore, the purpose of the undergone training schedule has been accomplished. Despite the achieved progress, the subjects' score awarded in line with RTF schedule is „average”.

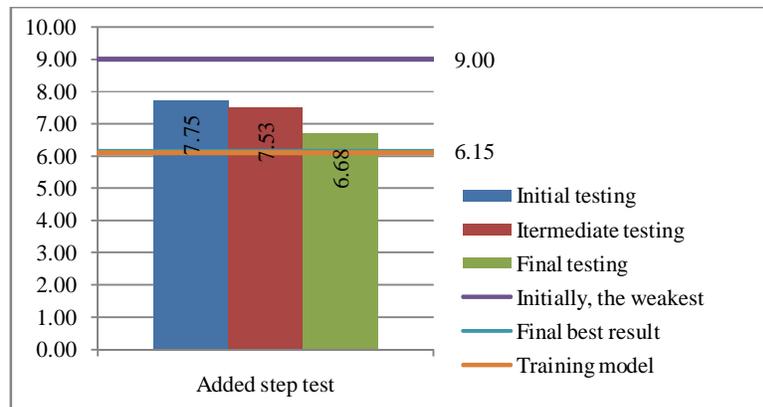


Fig. 2. Evolution for Aaded step test

The arithmetical average for the lateral run test was: 7.75 seconds upon the initial testing, 7.53 seconds upon the intermediate testing, and 6.68 seconds on the final testing. The difference between the averages of the final performances compared to the initial testing average is of 1.66 seconds in favour of the former, indicating an improvement of the results obtained for this test. Considering the outcome analysis, we notice an average progress of 1.7 seconds. Nevertheless, the results are situated by 0.58 seconds below the training schedule requirements. The group score for this test is “weak”.

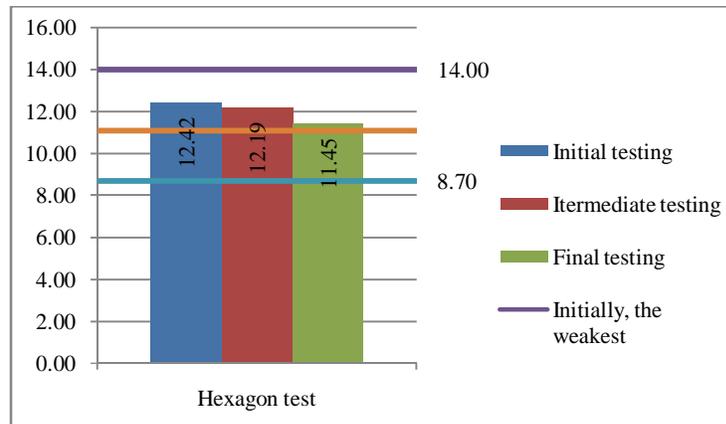


Fig. 3. Evolution for Hexagon test

The values specifying the average evolution of performances for all three tests undergone during the research, 12.42 seconds initially, 12.19 seconds during the study and 11.45 seconds in the end, show that consequently implementing the training means, the average progress reached a level below forecast. The subjects' score awarded in line with RTF schedule is "good".

### Conclusions

Considering the analyzed progress rates, we ascertain that consequently to the suggested training program, the athletes subject to study have known progress as for the results obtained. By comparing the obtained results upon the initial testing to the results on the final measurements, we ascertain a statistically significant difference, on a significance threshold  $p < 0.05$ , thus supporting the speculation of the research. As a result of applying the performed training program, the evolution of arithmetical averages enables the effectiveness of the achieved operational structures.

Consequently to framing the above mentioned results within the scores quota of Romanian Tennis Federation we ascertain that, comparing to the game requirements, these are easily reachable, therefore, we suggest either their review by increasing the scale score, or by including the score of "exceptional".

### Conflict of interest

No remark.

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## SPEED IMPROVEMENT IN CHILDREN AGED 6-9 YEARS THROUGH ATHLETICS-SPECIFIC MEANS

Ameliorarea vitezei la copiii de 6-9 ani prin mijloace specifice atletismului

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**Rezumat.** Suntem martorii unui fenomen de scădere a vârstei medii a campionilor olimpici și mondiali și a noului curent al debutului sportiv la vârstă timpurie; este cunoscut faptul că obținerea unei performanțe la nivel mondial implică cel puțin 8 ani de pregătire. Aceste argumente justifică necesitatea instruirii timpurii în atletism, începând cu vârsta de 6-7 ani, însă centrată pe obiective, menită să valorifice vârsta „de aur” a învățării prin împletirea armonioasă a celor 3 M (metode, mijloace, materiale). Pornind de la ideea că plăcerea înlătură plictiseala și sporește eficiența activității, am creat un program de antrenament bazat pe mijloace din atletism, pentru a studia impactul acestuia asupra vitezei. Studiul s-a desfășurat pe parcursul unui an școlar, pe o perioadă de 10 luni (copiii au participat la 2 lecții pe săptămână, cu o durată de 90 de minute), aplicându-se o testare inițială, o testare intermediară după 5 luni de la începerea programului athletic și o testare finală la sfârșitul anului școlar. Ca urmare a procesării statistice, am remarcat o ameliorare a vitezei la grupul experimental, în comparație cu grupul de control.

*Cuvinte-cheie:* viteză, antrenament timpuriu, mijloace din atletism

**Abstract.** We are being the witnesses of a phenomenon involving the decrease of the average age of Olympic and World champions, and of the new trend of sports debut at an early age, because achieving world performance requires at least 8 years of training. All these arguments justify the necessity of early training in athletics, starting with the age of 6-7, which is substantiated on a coherent strategy meant to valorise the “golden” age of learning through the harmonious mix of the 3 M (methods, means, materials). Based on the idea that pleasure removes boredom and increases efficiency of the activity, we have designed a training programme with means from athletics, in order to study its impact on speed. The study was conducted over a school year, for a period of 10 months (the children took part in 2 lessons per week, with a length of 90 minutes). It started with an initial testing and was followed by an intermediate testing after 5 months of applying the athletic programme and a final testing at the end of the school year. After the statistical processing, we noticed an improvement of speed in the experimental group, as compared to the control groups..

*Keywords:* speed, early training, athletic means

### Introduction

We are being the witnesses of a phenomenon involving the decrease of the average age of Olympic and World champions, and of the new trend of sports debut at an early age, because achieving world performance requires at least 8 years of training.

In athletics, the selection at national level used to be made among children aged 10 to 12 years, who were quickly integrated into the training process due to the partial use of a playful way of training, the coach being also influenced in his decision-making by the contests included in the competition calendar; the early beginning of selection and training around the age of 6 frees the teacher from the pressure related to competition, and the playful approach may be exclusively used in multilateral preparation, which entails increased enthusiasm in children. Thus, the pleasure experienced by them makes athletics become a long-term habit. It is well known that pleasure removes boredom and increases efficiency or performance by merely amplifying the emulation; whenever the children are experiencing pleasure, they do not feel like having to observe certain rules or standards imposed to them.

In the first school stage, the largest increase in the frequency and speed of movement is registered by Kohler (1977), Koinzer (1978), Dieckmann and Letzelter (1987), Lehmann (1993) (quoted by Weineck, 1992). At this age segment, the reaction speed and the latency time conditioning it significantly improve, as the latter one reduces from 0.50 to 0.60s in children aged 6 to 7 years and from 0.25 to 0.40s in children aged 10 years, according to Markosian and Wasiutina (quoted by Weineck, 1992).

We know that speed is strongly determined by the genetic heritage, which means that its training potential is reduced, as it can be increased by training only in a percentage of around 20%, according to Filin (quoted by Bota, 2000). Thus, if the improvement does not occur at the time favourable to the various manifestations of speed, this one hardly improves later on if ever, which leads to the conclusion that it is highly important that the early training of children in athletics should start at the age of 6. Velocity training in children aged between 6 and 16 years is facilitated by the mobility of fundamental processes and the plasticity of brain's cortical surface, but also by the

need for movement and the increased curiosity specific to this age, which may be a real support for the motor skill learning.

According to Bompa (2010), speed development depends on factors such as: heredity, reaction time, capacity to overcome an external resistance, technique, power of will, concentration and muscle elasticity. All these arguments justify the necessity of early training in athletics starting with the age of 6-7, which is substantiated on a coherent strategy meant to valorise the “golden” age of learning through the harmonious mix of the 3 M (methods, means, materials). The study was conducted over a school year, for a period of 10 months (the children took part in 2 lessons per week, with a length of 90 minutes). It started with an initial testing and was followed by an intermediate testing after 5 months of applying the athletic programme and a final testing at the end of the school year.

The athletic physical preparation programme for the experiment group has been designed starting from the idea that the play represents the best modality to discover athletics at this age and that the variety of means used in the training sessions corresponds to the particularities of this age segment. Thus, the athletic programme is based on relay races, applicative routes, movement games, the circuit method, as well as on means with an emulative and playful character. The control group 1 participates in the athletic preparation lessons on the “Lia Manoliu” stadium, while the control group 2 participates only in the physical education lessons.

*Purpose of the study.* Based on the idea that pleasure removes boredom and increases efficiency of the activity, we have designed a training programme with means from athletics, in order to study its impact on speed.

*Hypothesis.* The use of applicative routes and relay races based on athletic means ensures a significant improvement of speed, as a basic physical quality, in children aged between 6 and 9 years.

### **Subjects and methods**

*Subjects.* The experiment was conducted at the Middle School no. 190 of Bucharest and aimed to test the children from classes with a sports programme - athletics, who took part in 2 lessons per week, with a length of 90 minutes. 30 children aged 6 to 9 years were tested (the experimental group) and also another group of 20 children (the control group 1) who practiced athletics on the “Lia Manoliu” stadium, as well as a group of 30 children (the control group 2) who participated in the physical education lessons at the Middle School no. 190. Initial testing took place between 17 and 23 September 2012, and final testing was applied at the end of the school year.

### **Materials and methods**

This is an ascertaining-type experiment and the physical test applied to check the hypothesis was the 50m sprint. The mathematical and statistical indicators used were: indicators of central tendency - arithmetic mean, indicators of dispersion - standard deviation, coefficient of variability, t-test and Anova test.

### **Findings and results**

At the final testing, the average results decreased by 0.849 sec., from 9.431 sec. at the initial testing to 8.582 sec. at the final one. Data are homogeneously dispersed around the average and the coefficients of variation are 5.59% at the initial testing and 3.11% at the final testing. The amplitude decreased by 0.91 sec. The confidence interval for the average difference is (-0.981, -0.717). The effect size (2.260) indicates a very large difference between the arithmetic means of the two testing moments. The bilateral dependent t-test shows that the average difference has reached the hypothesis according to which the average difference between the results of the two groups is statistically significant. Graphical representation supports these assertions.

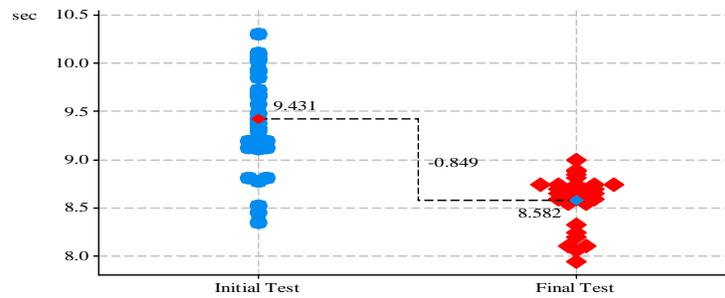


Fig 1. Experimental group - athletics - 50m sprint: initial testing and final testing

The average results recorded at the final testing decreased by 0.211, from 9.107 sec. at the initial testing to 8.896 sec. at the final one. Data are homogeneously dispersed around the average and the coefficients of variation are 6.34% at the initial testing and 5.13% at the final testing. The amplitude decreased by 0.15 sec. The confidence interval for the average difference is (-0.342, -0.080). The effect size (0.705) indicates a large to very large difference between the arithmetic means at the two tests. The bilateral dependent t-test shows that the average difference is statistically significant:  $p = 0.005 < 0.05$ . We reject the null hypothesis and accept the research hypothesis stating that the average difference between the two test results is statistically significant. Graphical representation supports the assertions.

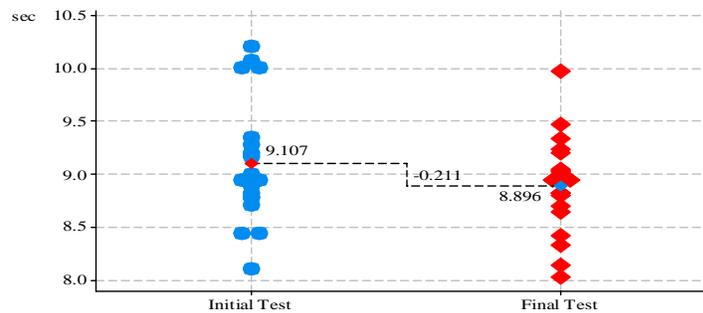


Fig 2. Control group - athletics - 50 m sprint: initial testing and final testing

In the control group 2 - with two lessons of physical education and sports, at the final testing, the average results decreased by 0.464 sec., from 10.844 sec. at the initial testing to 10.380 sec. at the final one. Data are homogeneously dispersed around the average and the coefficients of variation are 11.27% at the initial testing and 10.68% at the final testing. The amplitude decreased by 0.24 sec. The confidence interval for the average difference is (-0.611, -0.316). The effect size (1.126) indicates a very large difference between the arithmetic means of the two testing moments. The bilateral dependent t-test shows that the average difference has reached the hypothesis according to which the average difference between the results of the two groups is statistically significant.

Table 1. Sample statistics - 50m sprint

Groups	Mean	Median	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum	Coefficient of Variation
				Lower bound	Upper bound			
Experiment	8.582	8.650	0.267	8.488	8.676	7.950	9.000	3.1%
Control 1	8.896	8.940	0.456	8.696	9.095	8.030	9.980	5.1%
Control 2	10.380	10.640	1.108	9.984	10.777	8.000	12.210	10.7%

Table 2. Test of Homogeneity of Variances

Levene's Statistic	df <sub>1</sub>	df <sub>2</sub>	P (Sig.)
31.851	2	78	0.000

Table 3. ANOVA - Single factor

Source of Variation	Sum of Squares	Df	Mean Square	F	P (Sig.)	Effect Size
Between Groups	54.218	2	27.109	50.696	0.000	1.140
Within	41.709	78	0.535			
Total	95.927	80				

Table 4. Robust Tests of Equality of Means

Brown-Forsythe	Statistic	df <sub>1</sub>	df <sub>2</sub>	P (Sig.)
	55.665	2	43.163	0.000

Table 5. Multiple comparisons

Test	Final Tests		Difference between Means (I-II)	Std. Error	P (Sig.)	95% Confidence Interval	
	I	II				Lower Bound	Upper Bound
Games-Howell	Experiment	Control 1*	-0.314	0.113	0.025	-0.593	-0.034
		Control 2*	-1.798	0.208	0.000	-2.309	-1.288
	Control 1	Experiment*	0.314	0.113	0.025	0.034	0.593
		Control 2*	-1.484	0.227	0.000	-2.036	-0.934
	Control 2	Experiment*	1.798	0.208	0.000	1.288	2.309
		Control 1*	1.485	0.227	0.000	0.934	2.036

Control 1 - Athletics; Control 2 - Groups with two lessons of physical education and sports

\* Statistically significant

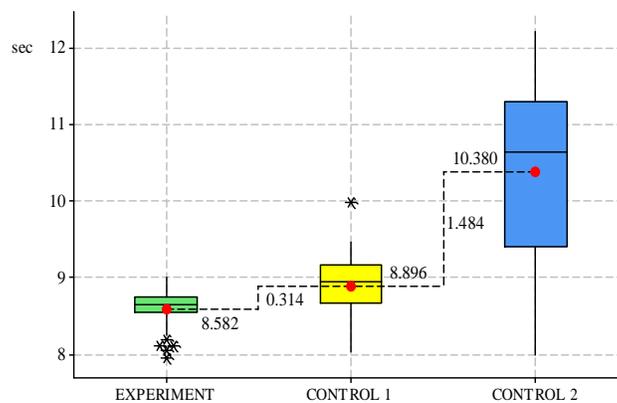


Fig 3. Results obtained by the representatives of the three groups at the 50m-sprint final tests

The results obtained by the representatives of the three groups at the 50m-sprint final tests show no equal dispersions according to Levene's test,  $p < 0.0001 < 0.05$ . In this context, Brown-Forsythe test and also ANOVA test, recording  $p < 0.0001 < 0.05$ , demonstrate that there is at least a couple of groups whose results are significantly different from the statistical point of view.

According to Games-Howell post hoc test on multiple comparisons for unequal variances, there are significant differences between the results of the Control 1 experimental group, Control 2 experimental group and Control 1 - Control 2 experimental groups, the “p” significance threshold associated with each pair being smaller than 0.05.

We reject therefore the null hypothesis and accept the research hypothesis according to which there are statistically significant differences between the results recorded by the three groups, which is shown in the graph above.

### **Conclusions**

Following the statistical processing, we noticed an improvement of speed in the experimental group, as compared to the control groups. Thus, the preparation programme proposed by us has proved to be more efficient in improving speed at this age, as compared to other work programmes, a fact which is statistically confirmed. So, the use of applicative routes and relay races leads to speed improvement in children aged 6 to 9 years.

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## SQUASH – A LEISURE ACTIVITY

Squash – un sport de agrement

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**Rezumat.** Squash-uleste un sport relative nou aparut în Romania, practicându-se în ultimile două decenii. Este practicat de numeroși indivizi ca și sport de recreere împreună cu alte activități sportive. Scopul actualei lucrări este acela de a prezenta principalele caracteristici ale Squash-ului și de asemenea de a sublinia beneficiile practicării acestei activități sportive, de intensitate ridicată. Squash-ul a fost declarat "Cel mai sănătos sport" ca și recunoștință pentru beneficiile practicării lui. Pe lângă aspectele competitive, Squash-ul are și o importanță latură socială ceea ce îl face un sport atractiv pentru toate vârstele, genurile și stilurile de viață. Squash-ul nu este propus ca un înlocuitor al activităților recreaționale clasice, alergatul, aerobicul, tenisul sau fotbalul ci ca o opțiune alternativă pentru persoanele cu un program încărcat care doresc practicarea unei activități pe tot parcursul anului.

*Cuvinte cheie:* squash, condiție fizică, sănătate;

**Abstract.** Squash is a relative new sport in Romania where it has been practiced for just over two decades only. It is enjoyed by many individuals at a recreational level, beside many other sport activities. The present paper aims to highlight its characteristics, and also to underline the benefits of practicing this sport as a fun intensive leisure activity. The Squash has been classified as "the world's healthiest sport" in recognition for its health benefits. Beside its competitive aspects Squash has a very powerful social aspect which makes it attractive for all ages, genders and lifestyles. Squash doesn't aim to replace traditional recreational activities, as running, gym, tennis or football, but aims to be a choice for the people with limited amount of time who can practice it all year around.

*Keywords:* squash, fitness, health;

### Introduction

The game of Squash is a sport practiced around the globe, in around 135 countries by millions of people. Along with tennis, badminton and table tennis, it is part of racquet sport's family. It is played on a relative small size closed area having the walls made by concrete or glass. It is practiced at different levels of performance (from professional to novice) by all age individuals (from 5 to +70 years old). Meyer, van Niekerk, Steenkamp, & Louw, (2007).

Squash is perceived as a very dynamic sport activity challenging in the same time the physical capacities and the technical skills of the players (Monpetit, 1990). In the last few years this sport star being played more and more in Romania where it has been promoted as "The best modality of modelling and shaping the body". The main purpose of present paper is to provide a general description of this sport (relative new in Romania). A second aim is to make a parallel between Squash and other popular physical activities practiced in Romania, taking in consideration different aspects (health, social, financial).

### State of knowledge

Squash along with tennis, badminton and table tennis, is played with a racket which therefore makes it a member of the "racquet sports" family. It is played by two (singles) or four players (doubles) in a relatively closed space where ball must be alternately hit by the player with a racket.

**Sport description.** The playing surface (court) consists of four walls and the floor, being bounded by different markings. At elite level the court dimensions (9.75 x 6.4 m) have been standardized by the governing authority – World Squash Federation (WSF) (figure 1). In professional tournaments, playing area consists of four glass walls, so the beauty of the game can be seen easily by spectators. At the amateur/leisure level the side walls usually are made of concrete.

The game rules are relative simple; one match is played in the system best of 5 games where a game is won by the player which reach first 11 points. A point is won when the ball is played outside the marking line (by the opponent) or it touches the floor twice before being hit. A full list of rules and regulations can be founded on the web page of WSF.

- The ball – official tournaments (under WSF authority) are being played with a “2 yellow dots” ball but there are as well different other kinds of balls (1 dot – white, red, blue, yellow). The difference between them consist in the way they behave: height and length of bounce. A “more bouncy” ball is preferred by the novices and juniors because will lengthen the rally duration, offering a more enjoyable game.
- The racquet – the shape and size of Squash racquet has been changed constantly until WFS has impose the standard limits for its neck and string size, width and weight. Therefore, even now the different companies can put their of “signature” on the racquet design it must remain with the WFS standards. All this measurements restrictions have been impose to protect the players as both of them are moving around and swinging they racquets with increased power and speed within the closed playing area.
- The gear – there is no restriction regarding the clothes, but they should remain at a decent sport class. The only reference is made towards the shoes which must have a “non-marking” soles in order to protect floor surface. No protective equipment is imposed for the elite/senior players and only for juniors it is advised to wear special glasses to protect their face for the fast moving ball (which can reach up to 150 km/h).

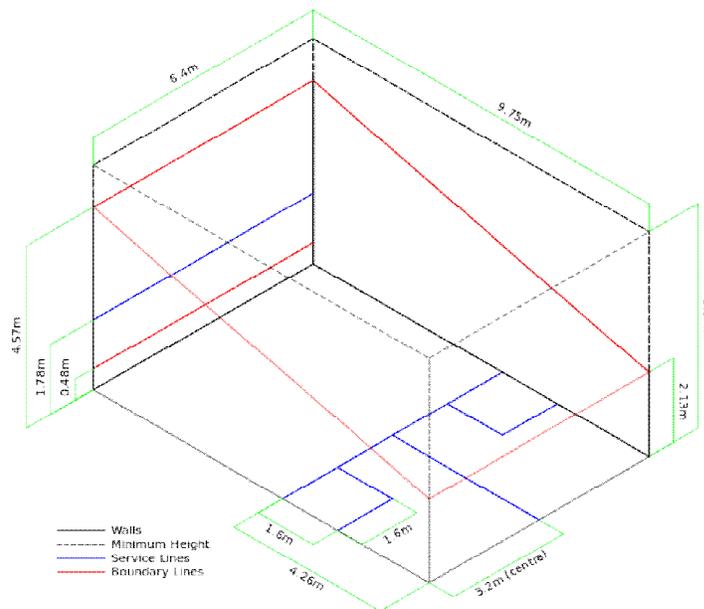


Fig.1 Dimensions of the playing surface in Squash (singles). The only change to double the width of the field is increased to 7.60m.

### Health benefits

Squash is a complex sport that is characterized by a sequence of accelerations – decelerations, direction changes, lunges, side steps, arm swings and trunk rotations. Based on the scientific literature that have been written around the game of squash, we summarized the possible benefits that a person might have when practicing Squash.

- Improve muscular strength – repetitive lunges, squats or arm swings challenge the muscle groups in all three ways of contractions: isometric, concentric and eccentric.
- Improve speed – the repetitive bounds of short distance accelerations improves the overall speed ability
- Improves overall flexibility – the movements are sometimes taking out of the regular amplitude and therefore the range of movement will be improved over time
- Enhances co-ordination – the repetitive ball hits at a fast speed enhance the hand eye coordination
- Blasts off fat – being played in a “point system” it became a “interval” physical activity which is known to use the fat as the main energy supplement.
- Improves spatial body awareness – as it is played in a restrictive area (with 4 walls) together with the opponent it’s very important to be aware of the exact body placement firstly to avoid any unwanted collisions and secondly to send the ball away from the opponent.

If at the leisure level the sentence “Play Squash to get fit” is valid, at the elite level a more adequate quote will be “Get fit to play Squash”.

#### *Social aspects*

- It's an sport activity which cannot be practiced alone ( as running, cycling, swimming)
- It's played in “multi courts” environment, so it's very easy to interact with other Squash enthusiasts
- It's the philosophy of Squash to be discussed, played and enjoyed in small communities
- It has been seen, from his origins in UK, as a modality to get together and spend quality time with other people

#### *Financial aspects*

- *From a player point of view* the equipment costs are relative small compared with other sports (Sky, diving).  
The equipment is usually offered free by the club where the court is rented.
- It is an indoor sport so it can be played all year around in the same location whatever the weather conditions are
- *From a “club manager view”* once the courts has been build the maintenance costs are minimal (cleaning only).  
Capital maintenance (polishing the floor, repainting the walls, remarking the lines) are required only once at every 1-2 years (depending on usage)

#### *Comparison with othersports*

##### *Squash vs. Tennis*

- Court size its larger in tennis comparing with the squash court (singles: 6,4 m x 9,75m – squash/ tennis (1 half) – 8.23m x 11.9 m )
- Duration of the game (tennis 2h females/ 3.5h males; squash; 40 min (male/females):
- Playing/rest ration its higher in squash competing with tennis (tennis 1:2 – 1:5 / squash: 1 – 0.5 )
- Equipment between the both sport its similar from expenses point of view ( shoes, rackets , balls )

##### *Squash vs. Table Tennis (TT)*

- The cost involved in the table tennis its lower compering with squash as it is much affordable to purchase a TT table and install it in any relative empty space while in squash you di require a proper squash court facility.
- The effort in TT its lower compering with squash as the covered distance of the players it's in average (squash: 2000 – 2.500 m / table tennis: 600 – 800m)

##### *Squash vs. Badminton*

- The equipment used its similar (shoes, rackets, gear) except the shuttlecock in badminton which are damaging fast (at least 1 per set).
- The intensity of the effort in badminton is similar with squash. (1-0.5)
- (WORLD BADMINTON FEDERATION:Laws, Part 2, Variation in court and equipment, Section 1 B)

##### *Squash vs. Running*

- The running is the cheapest sport activity that can be conducted anywhere by everyone
- The social and competitive aspects are much attractive in squash compering in running.

##### *Squash vs. Football*

- In football many individuals are required to play a game, in the squash you have the possibility of enjoying with a min of 2 players fact that will make the squash as leisure social sport very handy and easy to organize from the logistics point of view

##### *Squash vs. gym activity*

- In the gym, the routines applied are repetitive with not challenge aspects where in squash the challenge is all the time present in each rally
- In the gym there are not person to person direct challenge where in squash at all time you are playing against an opponent

In all above parallel between squash and the other sports we have highlighted the positive aspects of practicing squash as leisure sport. Also comparing with other sports (ex: tennis) you will make a difference in

your game within two to three weeks if playing three times a week. The calories that can be burned during a practice sessions are around 748 per hour (Mahoney and Sharp, 1995). The physiological profile of elite junior squash players.

Squash has been voted by Forbes Magazine as the world's healthiest sport, in recognition of the fact that it provides a thoroughly modern and potentially competitive, effective workout in minimal time and space which can be practiced all year round. This makes it ideal for urban lifestyles, of the kind that have generated increases in child obesity and other metabolic health issues. Squash is a great way to combat these trends for the good of mankind and children in particular.

### **Conclusion**

Squash is a gender-neutral sport and is accessible to all ages, colors and beliefs. Everyone can play, all you need is a racquet and ball, and to rent a squash court. You can get started instantly, as long as you can hit the ball with the racquet in the direction of the front wall. Squash has a learning curve that rewards as equally as it challenges. Squash is a sport that is easy to play, but where achieving greatness must be the result of hours of training on fitness and technique. It is enthralling, exciting, absorbing, rewarding.

Young people today crave instant or near-instant reward for their endeavors. There is no doubt after a game who is the winner; the winner is always the best player. These essential life values are well demonstrated by the pure sport of squash. Furthermore, the fact that both players share the same court space means that in competition, they have to co-exist. This unique feature of our game teaches valuable lessons of friendship and friendly rivalry.

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## THE EFFECTIVENESS OF THE TENNIS 10 METHOD IN THE SPECIFIC MOTOR DEVELOPMENT

Eficiența utilizării metodei tenis 10 în dezvoltarea motrică specifică

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**Rezumat.** Tenis 10 este componenta ITF (Federația Internațională de Tenis) pentru jucătorii de 10 ani și mai mici fiind concentrată pe creșterea nivelului de participare în tenis și pe furnizarea unor căi de dezvoltare mai adecvate pentru jucătorii mici, incluzând aici și competiții mai adecvate. Metoda Tenis 10 nou introdusă în pregătirea copiilor din tenis este destinată copiilor între 7 și 10 ani, fiind concepută special pentru nevoile și posibilitățile acestora.. Totul pare atât de greu pentru un copil de 7 ani pe un teren de tenis cu dimensiuni normale, racheta este atât de lungă și de grea, mingea parcă „fuge” prea repede. De aceea, a fost creat acest sistem, pentru a permite copiilor să poată învăța și juca într-un mediu potrivit lor. În această lucrare ne-am propus să evaluăm impactul pe care îl are utilizarea metodei de antrenament Tenis 10 asupra dezvoltării calităților motrice specifice jocului de tenis, având ca finalitate îmbunătățirea metodelor de pregătire a copiilor prin această metodă. Mijloace și materiale necesare în tenis pentru a putea organiza antrenamente sau competiții Tenis 10, cluburile au nevoie de o dotare corespunzătoare, diferită de cea specifică tenisului standard. Atât în privința suprafeței de joc, cât și a mingilor și a raketelor, intervin elemente aparte, ce vin în întâmpinarea părintelui dornic de a-și vedea copilul progresând rapid. Nevoia de a folosi mingi mai ușoare apare ca urmare a dificultății pe care o întâmpină chiar și copiii de zece ani, legată de faptul că mingile standard sar la o înălțime prea mare, împiedicându-i de multe ori să lovească în mod corect și eficient. Scopul mingilor mai lente este de a oferi jucătorului mai mult timp, mai mult control asupra execuției și o înălțime potrivită de lovire, pentru ca acesta să poată servi, să țină mingea în joc și să facă punct încă de la început.

Cuvinte cheie: metoda Tenis 10, dezvoltare motrică, copii.

**Abstract.** Tennis 10 is the International Tennis Federation (ITF) component for the 10-year old and younger players, being focused on increasing the participation numbers for tennis and providing paths of development more adequate for younger players, including more adequate competitions. The Tennis 10 method, newly introduced in the children's tennis training, is aimed for children between 7 and 10 years old, being conceived especially for their needs and possibilities. To a seven-year old child everything seems so hard on a tennis court, the racquet is so big and heavy, and the ball seems to "run" too fast. That is why this system was created, to allow children to learn and play in an environment that is suited for them. This paper tries to evaluate the impact that the use of the Tennis 10 coaching method has on the development of the motor skills that are specific to tennis, aiming to improve the children's training methods through this system. Means and materials needed in tennis - in order to be able to organize Tennis 10 trainings or competitions, the clubs need the right materials, different than the standard tennis ones. Both in regards to the court, and the balls and racquets, there are particular elements that meet the parents' demand to see their child progressing rapidly. The need to use lighter balls appears as a response to the difficulty that even the 10-year-olds encounter, linked to the fact that standard balls bounce too high, not allowing the children many times to strike them correctly and effectively. The purpose of the slower balls is to offer the players more time, more control over their performance and a right height for striking, so that they can serve, keep the ball in the game and score right from the beginning.

Key words: Tennis 10, motor development, children

### Introduction

Dragnea and Bota (1999) in *Teoria activităților motrice*, Ed. Didactică și Pedagogică, Bucharest, p. 125, specify that "motor development is regarded as a gradual process of learning the motor skills during the first stages of life, in childhood and adolescence."

According to Moise (2002) in *Teoria tenisului modern*, vol. II, Ed. Printnet, Bucharest, p. 8 the balls used in the Tennis 10 method are: *the red ball* (75% more decompressed than a standard one): made of a sponge or a special fiber, it is perfect for beginner children - soft at touch, it does not bounce too high, and its size is somewhat bigger than that of an orange or green ball. The recommended age for using this ball is up to 8 years old, the court dimensions being of 11 m in length, and 5-6 m in width. The children learn the fundamental elements of tennis since the first lesson, they enjoy themselves on the court, they play in teams, developing a better technique and experiencing movement on the court. The smaller racquets ensure a consistent contact with the red ball, which has a slow speed. The children will be able to serve, varying the direction, maintaining a constant play of over 20 strikes, with a varying speed and ball direction, in order to control the game and make the opponent move (Elliott B., (1981), *Tennis racquet selection: A factor in early skill development*, Australian Journal of Sport Sciences, p. 23-25).

*The orange ball* (50% more decompressed than a standard one): made of a fabric identical with the one the yellow ball is made (standard); it is faster and bounces higher than the red ball. The recommended age for using

this ball is up to 9 years old, the court dimensions being of 18 m in length, and 6.5-8.23 m in width. The players go to a larger court, corresponding to their height, improving their precision and taking into account the way in which the racquet strikes the ball. The ball is somewhat faster, but it still provides an optimal striking area. It allows however longer exchanges, compared to the red level. This stage ensures the learning of a complete set of strikes, including the lift, attacking and counter-striking, diversification of strikes. The children strike the ball with a purpose and they are able to identify strong and weak points in their and their opponents' game. *The green ball* (25% more decompressed than a standard one): it is very similar to the standard yellow ball, but somewhat slower and bounces less. At any rate, it is faster and bounces higher than the red and orange balls. The recommended age for using this ball is up to 10 years old, the court dimensions being of 23.77 m in length, and 8.23 m in width. The green ball is faster than the orange one, but it's still lighter and bounces less than a regular yellow ball, allowing the development of several advanced game techniques and tactics. The players gain advanced skills regarding their court positioning, ball striking and weight transfer, to be able to adapt to every game situation. In theory, without any guidance, the parents have a tendency to give their children a big racquet, without taking into account elements such as the children's height and weight. As a basic indication, when the child stands straight, arm aligned with the body, if the racquet that he is holding is touching the ground, then it is too big. Because of this, tennis might appear to the children as being hard labor, because they will encounter difficulties in controlling the ball, they could develop a too passive game style, and they might even injure themselves. Tennis 10 recommends certain dimensions of the racquet according to the game level: red (41-58 cm), orange (58-63 cm), green (63-68 cm). The grip of the racquet is also an important element, a too thick or too thin one damaging the fluency of the strike. The Tennis 10 courts allow the children to gain game skills more easily, due to the dimensions of the surface adapted to their physical abilities. Because of that, they can learn specific elements related to movement, positioning and ball striking in a shorter time than if they would start off in a standard sized court. As they develop their height, strength and speed, the children go from a small court (red), with a low net, that allows from the start prolonged exchanges, to a court that is closer to the regular size (orange). Later, they advance to a standard-sized court (green), but the balls are still decompressed (10 Tennis, 15 June 2013).

*The specific tennis means* are represented by the system of exercises that ensures the learning of the specific technical elements and the development of motor skills. Tennis has three basic strikes: the forehand, the backhand, and the serve.

The *aim* of this research is to highlight the impact of the Tennis 10 method on the development of motor skills in children.

For this study, the following *objectives* have been set:

- the improvement of the children's motor skills by applying the Tennis 10 method;
- highlighting the effectiveness of the Tennis 10 method for children's training.

This study tried to verify the *hypothesis* stating that the use of the Tennis 10 method in the training of children, for a period of 8 months, determines an increase in the motor development and effort adaptation capacity in children.

## Materials and Methods

The subjects in this research were 56 children (31 boys and 25 girls), aged between 7 and 9, selected in 2013 from various Bacau schools. They were divided in two groups equal in number: experimental and control.

The research methods used were established according to the research objectives, as follows. *the bibliographical study method*, to know the scientific basis for this theme, and the new data provided by the professional literature, *the assessment method*, *the experiment method* used here to verify the hypothesis, *the statistical-mathematical method* used to transpose the results of the measurements into assessment indices, and *the graphical representation method*, used here to emphasize the significance of the analyzed data and to suggestively interpret the highlighted phenomena.

The *applicative intervention* for the experimental group was conducted at the "Ion Creanga" School, while the one for the control group, at the "Nicolae Vasilescu Karpen" Technical College of Bacau, starting with the 2nd of October 2013, over the course of 8 months. The training lessons were conducted 2 times a week, with one hour for each lesson.

## Results and Discussions

Regarding the side-step challenge, one can see that the average values are as follows: the experimental group (Table 1) recorded an initial average of 7.48 and a final one of 7.04, representing an improvement of the performances of 0.44, while the control group (Table 1) recorded an initial value of 7.44 and a final one of 7.13, representing an improvement of 0.31. At this challenge, both the experimental and the control group recorded better values during the final testing than during the initial one. Thus, one can observe a larger improvement in the experimental group than in the witness group.

Regarding the standard deviation, one can observe that the differences are small, insignificant between the deviations in various stages of testing, therefore one can say that there is a good homogeneity of the values recorded by the experimental and witness groups, which indicates a low dispersion (Table 1).

The values of the standard deviation from the average are also small, indicating that the results recorded by the subjects in the two groups have a central tendency, being situated around the arithmetical mean, with a low scatter degree, therefore a good homogeneity (Table 1).

Regarding the fan-shape challenge, one can see that the average values are as follows: the experimental group recorded an initial average of 24.81 and a final one of 21.10, representing an improvement of the performances of 3.70, while the control group recorded an initial value of 25.36 and a final one of 22.29, representing an improvement of 3.07. At this challenge, both the experimental and the control group recorded better values during the final testing than during the initial one.

Regarding the standard deviation, one can observe that the differences are small, insignificant between the deviations in various stages of testing, therefore one can say that there is a good homogeneity of the values recorded by the experimental and control groups, which indicates a low dispersion.

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Table 1. Comparison between the initial-final averages of the control and experimental groups, T-test, dependent variables

Control		Arithmetical mean	Standard deviation	Standard Deviation
<b>Pair 1</b>	Fan-shape initial	25.3646	3.21504	.60579
	Fan-shape final	22.2907	2.02960	.38356
<b>Pair 2</b>	Side step initial	7.4475	0.73789	0.13945
	Side step final	7.1357	0.75424	0.14254
Experimental		Arithmetical mean	Standard deviation	Standard Deviation
Pair 1	Fan-shape initial	24.8189	2.25102	.42540
	Fan-shape final	21.1096	3.13075	.59166
Pair 2	Side step initial	7.4868	.81228	.15351

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Side step final	7.0443	.85755	.16206
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### Conclusions

At the end of this paper that tried to emphasize the impact of using the Tennis 10 method when elaborating training programs, the following conclusions were drawn: **the hypothesis** stating that the use over a period of 8 months of the Tennis 10 method determines an increase in the motor development and effort adaptation capacity in the children, was confirmed; at the end of the assessment of motor skills through the fan-shape and side-step challenges, one can see that there is a positive dynamic in regards to the arithmetical means recorded during the final test, compared to the initial one, which shows a progress of the motor skills in the tested subjects of both groups.

In conclusion, children up to 10 years old are not discouraged in practicing tennis because stage re-dimensioning takes into account their physical ability to reach the ball in time and to strike it over the net. Installing and using Tennis 10 courts leads to attracting an increasing number of children who are interested in playing tennis as frequently as possible. More than that, the tennis initiation and teaching programs based on the Tennis 10 principles make the children come back to the game every time, due to the ease of play and entertainment value. At the same time, installing this type of courts determines a better capitalization of the space within each club and allows extra income to be cashed in.

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## ORIENTATIONS AND TENDENCIES IN TRAINING 6-8 YEAR-OLDS TO GUIDE THEM TOWARDS FOOTBALL

Orientări și tendințe în pregătirea copiilor de 6-8 ani pentru orientarea către jocul de fotbal

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**Rezumat.** *Orientarea sportivă bine realizată, pregătirea pe toate axele, asigurarea indicilor crescuți ai tuturor factorilor de formare a unui fotbalist, beneficiază de interdependența și condiționarea reciprocă a acestora în evoluția lor în joc, iar efectele nu pot fi decât calitativ superioare. Folosirea modelelor metodologice adecvate, corelate cu stadiul pregătirii și dezvoltării copiilor de 6-8 ani, se poate obține îmbunătățirea substanțială a dezvoltării motrice a acestora și implicit eficientizarea procesului de orientare sportivă către jocul de fotbal. Subiecții cuprinși în această cercetare, lotul experimental, sunt sportivi deja selecționați în cadrul cluburilor deja amintite. Ei au fost supuși unei testări inițiale și vor mai fi supuși unei testări finale, pe baza acelorași teste pe care le vom aplica în selecționarea elevilor de 6-8 ani din mediul școlar. Rezultatele obținute în urma colectării, ordonării și prelucrării datelor privind testarea inițială și cea finală sunt prezentate în tabelul nr. I și nr.II. Tendințele actuale de pregătire a copiilor la etapa de inițiere converg spre realizarea unor antrenamente corecte și eficiente având la bază o serie de metode, mijloace, materiale atent selecționate, ce acționează multilateral asupra copiilor de vârstă școlară mică.*

*Cuvinte cheie:* orientare, jocul de fotbal, pregătire, dezvoltare motrică

**Abstract.** *Properly performed sporting orientation, training in every aspect, ensuring the increased indexes of all factors of forming a football player, benefits of their interdependence and interaction in their game evolution and the effects can only be superior in quality. Using adequate methodological models, correlated with the stage of preparation and development of 6-8 year-olds we can substantially improve their motion development and, implicitly, the efficiency of the process of sporting orientation towards football. The subjects involved in this research, the experimental lot, are athletes already selected in the above-mentioned clubs. They have been submitted to an initial test and will also be submitted to a final test based on the same tests given in selecting the 6-8 year-old students from the scholastic environment. The results obtained sequent to data gathering, arrangement and treatment related to the initial and final testing are shown in table no. I and table no.II. Current tendencies of training children at the initial stage converge towards the accomplishment of correct and efficient training sessions based on a series of methods, means, carefully selected materials, which act multilaterally on young children.*

*Key words:* orientation, football, training, motion development

### Introduction

Presently, performance sports have been increasingly demanding all human individual possibilities, which makes this resort unapproachable to those who are not endowed but also formed to respond adequately to these requirements. Formation essentially means the expression of all their efforts, be it physical, mental, social, or financial and the not turning these efforts into the achievement of one's goal, can get extremely depressing. (Dragnea *et al.*, 2002:287)

In this context, sporting orientation is to be entitled by the requirement to form a group of athletes who are well endowed ability-wise, but who also show an ability of psychological development and self-exceeding to finish the effort made by gaining *performance*. Getting special results in sporting competitions involves reaching a certain level of exigency and tension, well above average; that is why the role of the mental component becomes determinant, because through it we can access biological resources that in regular conditions would not have been manifested and releasable. (Gomez-Cabrera *et al.*, 2008:44)

*The orientation towards performance sports is a continuous and permanent process where the elements of value refresh the strength of the beginners' group, thus increasing its value of perspective.*

At the age of their football debut, children manifest enthusiasm and optimism, they have impetuous gestural behaviours, they stand out due to an obvious attraction to sports and to sporting competitions. The primary emotional interest in practicing football represents the starting point in the organised activity. (Oancea *et al.*, 2007:69)

*The modern concept of sporting orientation includes the concept of training.* When performing the operations of the selection process, we start from the final model of the future football player. This means drafting the main features of the player we want to accomplish. (Prescorniță, 2004:71)

The new concept, mainly outlined internationally, grants a larger importance to the process of initial orientation and selection, but also a differentiated treatment of the said selection, which develops according to the

requirements of the models on both formative and performance levels. In these authors' opinion, initial orientation and selection are two inseparable processes but which are obviously limited by their goals. (Colibaba, 1998, 250).

Orientation starts from the individual (subject-person) and aims at identifying the predominant features they have, their acknowledgement of their own prowess and the guidance (orientation, recommendation, advice) towards practicing a sporting branch where they could be asserted. (Niculescu, 2009:183).

*Hypothesis.* Using adequate methodological models, correlated with the stage of preparation and development of 6-8 year-olds we can substantially improve their motion development and, implicitly, the efficiency of the process of sporting orientation towards football.

### **Material and methods**

In order to accomplish the aimed experiment that underlies the conception of the study, I collaborated with a series of football specialists from the country, especially from the town where I perform my activity – Arad. In order to elaborate, experiment and implement a project of primary selection system I have cooperated with the Arad County Football Association, the Arad County School Inspectorate, the U.T. Arad Club (coach: Cuedan Dan), Arad Atletico Sporting Club (coach: Iosza Norbert), Aron Cotrus Elementary School – Arad (teacher: Iosza Norbert), Mihai Eminescu Elementary School no. 1 – Arad (teacher: Cuedan Dan), the Sports Medicine Office (dr. Nica Adriana). The subjects involved in this research, the experimental lot, are athletes already selected in the above-mentioned clubs. They have been submitted to an initial test and will also be submitted to a final test based on the same tests given in selecting the 6-8 year-old students from the scholastic environment. The goal of this pilot-experiment is to compare the results of athletes already involved in the performance activity with those of students in the scholastic environment. The research subjects uninvolved in the football phenomenon organised, the control lot, completely made of boys, are 6-8 year-old students from the first to the third grade from the “Aron Cotrus” Elementary School – Arad (teacher: Iosza Norbert) and the “Mihai Eminescu” Elementary School no. 1 – Arad (teacher: Cuedan Dan).

We estimated that our research will develop from 2013 to 2014. In order to develop it well, we benefitted from the support of the management and technical bodies of the junior groups of the U.T. Arad and C.S. Atletico – Arad.

### **Tests and evaluations**

#### *Speed run in 5\*5 m*

*Purpose:* assessing speed in terms of coordination.

*Description:* from a standing starting point, on an individual mark, the student will perform a speed run five times back and forth on a 5 m distance.

*Methodology:* the teacher will start the timer at the first motion of the student's foot and will stop it when the student's chest passes the finish line. During the run, the student must pass the line on the ground with both feet. Two attempts are granted at a 15-minute interval. The best result (in seconds) will be recorded in the registration paper.

*Resources:* running track of minimum 5 m in length, flat terrain marked at both ends, with 1 m long parallel lines. The track will be previously cleaned before the tests in order to eliminate all sources of accidents. At the ends of the running track, we will need an additional distance of at least 2 m until a possible obstacle – fence, wall – so that the student can safely turn around while running.

#### *Push ups*

*Purpose:* assessing strength in terms of endurance of the upper body muscles.

*Description:* lying face down, feet on the ground and palms of the gymnastics bench, body stretched and eyes forward, the student will bend his arms until his chest approaches the bench then he will go back to the initial position.

*Methodology:* A correct performance will be that which finishes with the chest approaching the bench at a maximum distance of 10 cm. The maximum number of performances will be recorded in the registration paper. A single series of performances will be granted. Only the correct performances will count.

*Resources:* the evaluation will be made with both hands on the gymnastics bench.

#### *Throwing the “oina” ball from a standing position*

*Purpose:* assessing the explosive force of the muscles in the superior limbs.

*Description:* while standing with their legs apart, having the foot opposite to the throwing arm forward, the students will throw the “oina” ball with one arm.

*Methodology:* while behind the marked line, the student standing with his legs apart, having the foot opposite to the throwing arm forward, will throw the “oina” ball as far as possible. Students will be granted 2 attempts. Only the best result (in metres) will be recorded in the registration paper.

*Resources:* starting line for the throw drawn by the teacher, rounder ball, measuring tape.

#### *Squats*

*Purpose:* assessing strength in terms of endurance of the lower body muscles.

*Description:* from a standing position with arms stretched forward, the student will perform squats.

*Methodology:* a correct performance will be that which finishes with the inferior limbs bent, so that the thigh touches the calf. The student will only get one attempt. The maximum number of performances will be recorded in the registration paper. Incorrect performances will not count.

*Resources:* the evaluation will take place on a flat field.

#### *Standing long jump*

*Purpose:* assessing force in terms of speed of the lower body muscles.

*Description:* while in a standing position and balancing the arms, the student will perform a standing long jump.

*Methodology:* it counts as a correct performance if it finishes by only touching the ground with the feet. Everyone is granted two attempts. In order to measure as correctly as possible, the teacher will mark the ground where the student’s last trace is and he will use the measuring tape. The best result (in cm) will be written in the registration paper.

*Resources:* the evaluation will be held on a flat field. The teacher will additionally mark the landing area on the ground with a ruler that emphasises the 10 cm distance among the lines, starting from the 50 cm line.

#### *Sit ups*

*Purpose:* assessing abdominal muscle strength.

*Description:* while lying down with their backs on the ground, hands behind their heads, feet steady on the ground, knees semi-relaxed, the students will perform vertical sit ups (90<sup>0</sup>).

*Methodology:* a correct performance is that which finishes by the lift of the stern at 90<sup>0</sup> with hands held behind the head. The maximum number of performances will be recorded in the registration paper. Each student is granted one series of performances.

*Resources:* the evaluation is performed on the gymnastics mats. In order to hold his feet steady on the ground, the student will benefit from the help of a colleague or he will put his feet on the first step of the fixed ladder. Incorrect performances will not count.

#### *Face down back extensions*

*Purpose:* assessing the strength of back muscles.

*Description:* while lying face down, with his hands at the back of his head, the student will perform back extensions.

*Methodology:* a correct performance will finish with the lift of the stern with the hands behind their heads so that the student’s chin reaches the superior level of a gymnastics bench placed at 3 cm from the student’s head. The maximum number of performances will be noted in the registration paper. Each student is granted one series of performances.

*Resources:* the evaluation is performed on the gymnastics mat. In order to hold his feet steady on the ground, the student will benefit from the help of a colleague or he will put his feet on the first step of the fixed ladder. Incorrect performances will not count.

#### *Sitting forward bend*

*Purpose:* assessing spine mobility.

*Description:* from a sitting position with feet held steady by the gymnastics bench, the student will bend his upper body forward with arms stretched so that the fingers exceed the support point of the feet.

*Methodology:* a correct attempt will finish by maintaining the legs stretched and the arms stretched forward on the same level. The distance between the tips of the fingers and the support point of the legs on the bench will be measured. In the registration paper, there will be a “+” if the tips of the fingers exceed the support point of the legs and a “-”, if they do not.

Resources: the evaluation will be held on a gymnastics mat placed parallel with a gymnastics bench. For the measuring, a ruler or a measuring tape will be used.

#### 2`30`` run

*Purpose:* assessing the capacity of aerobic effort.

*Description:* starting from a standing position, the run is performed on a flat terrain, with no bumps, in groups of 6-8 students. The run is continuous, at their own pace, for 2`30`` (2 minutes and 30 seconds), then measuring the distance made in metres.

*Methodology:* the teacher will start the timer at the first movement of the student's leg and will stop timing after 2`30``. Each student is granted one attempt and the distance made in metres is written on the registration paper.

*Resources:* flat running track, timer. The track will be cleaned before the evaluation in order to avoid any accidents.

#### Matorin test

*Purpose:* assessing the general coordination and balance.

*Description:* from a standing position, the student will perform a jump while twisting around the longitudinal axis of the body (to the left or to the right). During the jump, the student must not lose his balance, he must land with his feet together, like in the initial position, and the twist must have as many degrees as possible.

*Methodology:* the teacher draws a circle on the ground, with a 40 cm diameter (divided) and a start line of the jump. The student will be standing with his feet in both sides of the line drawn on the ground, arms hanging by his body, and he will perform a jump while twisting to the right and then a jump while twisting to the left. After each jump twist, the student will stand still where he landed (which should be where he started), and the teacher will measure the angle of the twist.

*Resources:* the evaluation will be held on a flat field. The teacher will use a piece of chalk to draw a divided circle and will measure the twist angle for each jump.

## Results and discussions

Table 1. Analysis of statistical indexes of students in the control group during the experiment

	Statistical indexes			
	Initial test	Final test	T	P
Physical development				
Height (cm)	127,4	127,9	3,12	>0,05
Weight (kg)	24,5	25,0	2,32	>0,05
Span (cm)	122,3	122,9	4,03	>0,05
Motion development				
Speed run 5x5m(sec)	7,03	6,95	4,24	>0,05
Push ups (number of performances)	2,81	3,27	2,67	>0,05
Throwing the "oina" ball from a standing position (m)	8,93	9,32	3,34	>0,05
Squats (number of performances)	10,67	11,02	4,04	>0,05
Standing long jump (cm)	96	101	2,07	<0,05
Sit ups (number of performances)	4,6	7,1	0,81	<0,01
Face down back extensions (Number of performances)	5,1	7,2	0,97	<0,01
2`30`` run (m)	327	387	1,76	<0,05
Sitting forward bend (no. rep.)	6,7	7,2	3,91	<0,05
Matorin Test(degrees to the right)	255	267	1,72	<0,05
Matorin Test (degrees to the	259	266	2,95	<0,05

left)

Thus, Table 1 reflects the results of the statistical indexes from the tests held in the control group, where we registered significant differences among most of the initial and final parameters at the significance point of  $P < 0.05$ . The only exception is the data regarding the level of physical development (size and weight) of the students who were tested. However, there is an increase in these parameters towards the end of the experiment, probably due to the natural physiological development of these boys. However the difference is not significant,  $P > 0.05$ .

By analysing the dynamic of motion parameters of 6-8 year-old students, we believe that they have developed all motion capacities mainly because of the physiological laws of the body, which are characteristic to this age, but also because of the guided influence of the specialized means and methods applied in the training process, an influence based on their previous motion experience. ( $P < 0.05$ ).

Hence, the analysis of the statistical results registered during the physical development and motion training tests applied to 6-8 year-old children from the control group proves that, towards the end of the experiment, there have been positive changes of these indexes, compared to the ones registered at its beginning. These changes are due both to the natural physiological development and to the influence of the training process. These changes are important to most indexes of motion development tests,  $P < 0.05$ . The weakest results were those from the speed run, push ups, and throw of the „oina” ball, where statistical results show  $P > 0.05$ . This was to be expected given that, at this age, the strength of the arms and upper body is quite low.

Table 2. Analysis of statistical indexes of students in the experiment-group during the said experiment

	Statistical indexes			
	Initial test	Final test	T	p
<b>Physical development</b>				
Height (cm)	128,6	129,1	3,94	>0,05
Weight (kg)	25,5	25,9	2,96	>0,05
Span (cm)	124,4	124,6	4,96	>0,05
<b>Motion development</b>				
Speed run 5x5m(sec)	6,87	6,82	3,07	<0,05
Push ups (no. performances)	3,32	3,93	1,53	>0,05
Throwing the „oina” ball from a standing position (m)	9,97	10,72	2,88	<0,05
Squats (no. performances)	11,67	12,02	4,04	<0,05
Standing long jump (cm)	102	107	1,69	<0,05
Sit ups (no. performances)	5,3	8,7	0,54	<0,01
Face down back extensions (no. performances)	5,5	8,3	0,42	<0,01
2`30`` run (m)	353	421	0,66	<0,01
Sitting forward bend (no. performances)	7,9	8,5	3,20	<0,05
Matorin test (degrees to the right)	267	282	1,40	<0,05
Matorin test (degrees to the left)	270	277	2,22	<0,05

Table 2 shows us the statistical indexes of the level of physical development and motion training of 6-8 year-old students in the experiment group. The comparative analysis of initial and final statistical data registered during the annual experiment also shows a positive dynamic. Thus, in our opinion, the improvement in the boys' physical

development results (size, weight) happened because of natural physiological changes, like in the control group, and do not present any statistically significant differences from the initial to the final stage ( $P > 0.05$ ).

This situation may also be explained by the fact that these boys have not yet reached the stage of sensitive age with significant increases in height and body weight. The positive dynamic of these parameters reflect the fact that the training experiment did not have a negative influence on the physical development (of the morphological status) of the boys in the experiment group. On the contrary, it contributes to their natural physiological development and their morphological growth.

Unlike the control group, the experiment group presents an improvement in the main motion criteria, by obtaining values of  $P < 0.01$  on several tests (sit ups, face down back extensions, endurance run), which indicates that our hypothesis was confirmed and the guidance of 6-8 year olds towards football has been performed successfully and has been correctly correlated to the presented training model.

Our own pedagogical observations on the training process developed during the annual experiment determined us to believe that students from the experimental group were more active while training, they had a lower degree of fatigue and learned technical procedures faster than those in the witness group.

We believe that the phenomenon we observed is conditioned by the primary sporting selection of students in the experimental group, which brought forward the most capable, meaning those who had a richer motion experience; this formed their functional-motion level, which is necessary when playing football.

This way, the results of the football training process proves that 6-8 year old students in the witness group, who were successfully promoted at the initial sporting selection, own psychological and motion abilities undoubtedly higher than those in the control group, which proves the efficiency of the Guidance of 6-8 year olds towards football according to some contemporary criteria of football primary selection and they respect efficient training schedules that are correlated to the stage of physical and motion development at the said age.

## Conclusions

Current tendencies of training children at the initial stage converge towards the accomplishment of correct and efficient training sessions based on a series of methods, means, carefully selected materials, which act multilaterally on young children.

The training sessions are focused on each training factor; it is permanently adapted to individual possibilities and the type of football. Due to the children's age, the training in team sports at the initial stage is especially done through games, competitions and relay races, the formative valences got from these activities being considered as a reliable "recipe" that underlies and leads to great future results.

Modern sports training of children is adjusted and restructured depending on the aimed results, and on the performance level set by top teams.

Increasing the importance in psychological and motion training in the general training process by adequate ways and means, offers the possibility of a sturdy training of future performance athletes. On the level of the experimental group, we managed to ensure a positive group climate that allows the exchange of useful information, surpasses critical moments and maintains a high mental tonus while training. After the evaluations given to the two groups, and also after experimenting the independent variable on the experimental group, I believe that there is a significant improvement in their performances.

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## STUDY ON THE RELATIONSHIP BETWEEN SOMATIC AND MOTOR DEVELOPMENT IN ROMANIAN 11 - 12 YEAR OLDS

Studiu privind relația dintre dezvoltarea somatică și motrică la copiii de 11 - 12 ani din România

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**Rezumat.** Starea de sănătate a copiilor și particularitățile creșterii și dezvoltării lor reprezintă subiecte majore ale studiilor din domeniul practicării exercițiilor fizice. Unul dintre aspectele cele mai dezbătute se referă la creșterea incidenței obezității la vârstele copilăriei, fenomen îngrijorător, care plasează România printre primele țări din Europa la acest capitol. Asociat tendinței de înlocuire a jocului și mișcării în aer liber cu alte consumuri culturale, acest fenomen influențează și nivelul de motricitate a copiilor. Obiectivele studiului. Prezenta lucrare își propune să analizeze relația dintre dezvoltarea somatică și motrică a 20.000 copii, de 11 - 12 ani, din diferite regiuni de dezvoltare ale României, din mediile rural și urban. Metode. Pentru realizarea studiului au fost analizate date obținute din aplicarea unor probe de control pentru evaluarea aptitudinilor motrice (viteză, forță, rezistență) și din măsurarea indicatorilor somatici (înălțime, greutate). De asemenea, a fost determinat indicele de masă corporală. Rezultatele au fost analizate comparativ între zonele de dezvoltare ale țării, precum și între mediile rural și urban. Rezultate și concluzii. Rezultatele obținute oferă o imagine relevantă asupra fenomenului studiat, în cadrul unor interpretări ce se constituie în date de referință pentru specialiștii din domeniile sănătății și educației. Studiul aduce argumentele necesare intensificării eforturilor de formare a stilului activ de viață încă din copilărie.

*Cuvinte cheie:* dezvoltare somatică; dezvoltare motrică; educație fizică; sport;

**Abstract.** The health of children and their growth and development peculiarities are major topics of studies in the field of physical exercise. One of the most debated issues is related to the increasing incidence of obesity in childhood ages, a worrying phenomenon that places Romania among the first countries in Europe among the surveyed nations. Associated with the trend of replacing outdoor play and exercise with other cultural consumption activities, this phenomenon influences the children's motor skills. Research objective. This paper aims to analyze the relationship between somatic and motor development of 20,000 children aged between 11 and 12 years, from different urban and rural development regions of Romania. Methods. The study analyzed data obtained from the application of control tests to assess motor skills (speed, strength) and measurement of somatic indicators (height, weight). The results were analyzed and compared based on the country's development areas and on the rural and urban areas. Results and conclusions. The results provide a relevant picture of the phenomenon, in the frame of some interpretations translated into reference data for professionals in the field of health and education. The study provides arguments for intensifying the efforts to form an active style of life since childhood

*Keywords:* somatic development; motor development; physical education; sport

### Introduction

For the human motricity sciences, the bio-motor potential is a key element because its development at different levels is a fundamental criterion of the educational process efficiency. The bio-motor potential assessment is a topical issue that concerns continuously specialists from various fields, and in particular the physical education and sport specialists (Cojocaru *et al.*, 2014). Our study is specifically aimed at the pre-pubertal age. On the somatic level, it appears that the height of the pupils has been recording an increased acceleration, and the body weight has been recording, especially in boys, a slight slowdown. In terms of motor development, the morpho-functional substrate of the body allows efficient activation as regards the bio motor qualities, especially in speed and skill (Stănescu, 2012:145 – 146).

The level of physical development is an important condition of health, which is influenced by both environmental and hereditary factors. From the morphological indices, this study assessed the height and weight of students aged between 11 and 12 years in two Romanian development regions – the North East and South East. Changes in body weight is actually an indicator of the health status, the risk that a child will become obese in adulthood is much higher if the parents are suffering from the same condition (Gannem *et al.*, 1993 quoted by Cordun, 2011: 150). Body height on the other hand is an appropriate example of a polygenic inherited trait, which is influenced by environmental factors during different life stages (Sinclair, 1987, quoted by Silventoinen *et al.*, 2003: 399). Many factors contribute to children's physical activity, and the built environment seen as a part of country's development areas, has garnered considerable interest recently, as many young children spend much of their time in and around their immediate neighborhood (Tappe *et al.*, 2013)

Studies regarding human obesity show that physical activity can attenuate the genetic influence on the body mass index which means that genetic predisposition to obesity induced by variation in FTO (fat mass and obesity associated) can be overcome, at least in part, by adopting a physically active lifestyle (Vimalleswaran *et al.*, 2009; Li *et al.*, 2010). Knowing the level of physical development and motor capacity is a key factor in the orientation of

physical education and sports for children. Therefore, they were also the key element in assessing the scope of specific motor activities. To determine the physical condition of large population, studies recommend several components to be measured like physical activity, cardiorespiratory fitness, muscle endurance or muscle strength but to study the development and prevention of chronic disease there is still a need for objective methods to be developed (Jørgensen *et al.*, 2009).

This paper presents only part of the results obtained under the national project *Evaluation of bio-motor potential of the school population from Romania* (2011 - 2012, MECTS, UNEFS), a research that sought to identify the bio-motor characteristics of students from 1st, 5th, 9th and 12th grades.

## Materials and Methods

*Aim of the paper.* This paper intends to analyze the relationship between somatic and motor development of 20,000 children aged between 11 and 12 years, from two development regions of Romania. Also, the level of motor capacity and somatic development of the students from the 11 counties in northeast and southeast regions have been analyzed in correlation with the nationwide data provided by previous studies, and with data from studies carried out in other countries.

## Methods

To examine the relationship between the motor and the somatic development we used a number of motor tests and somatic measurements: speed running (shuttle) 10 x 5m, push-ups, jumping length, raising the trunk lying face-down, height and weight measurement. The results were compared to previous studies conducted in Romania in 1972, 1982 and 1992, and with the minimum rates for various evaluation tests that are found in the National System of School Assessment in Physical Education and Sport (SNSE) in Romania.

As regards the somatic assessments (height and weight), they were analyzed in relation to similar studies conducted in the United States. The assessment results have been correlated with a number of socio-economic indicators such as the average salary, GDP per capita, unemployment or life expectancy. In order to identify possible correlations we calculated the correlation coefficients between the ranks recorded in the counties concerned in terms of motor test, somatic measurement and the living standard.

*Subjects.* This paper highlights the traits of 20,325 students' motor and somatic development from the 5<sup>th</sup> class, representing 11 counties in the Eastern side of Romania from both urban and rural area (Fig 1). 10,365 male students and 9960 female students were evaluated; 8580 from urban areas and 11,745 from rural areas. The lowest number of students is from Vaslui county, while in Iasi 4832 students from the 5<sup>th</sup> class were evaluated. Regarding the two development areas that were the subject of our paper, 13811 students were evaluated in the northeast region, while the difference, namely 6514 students were from the southeast region.

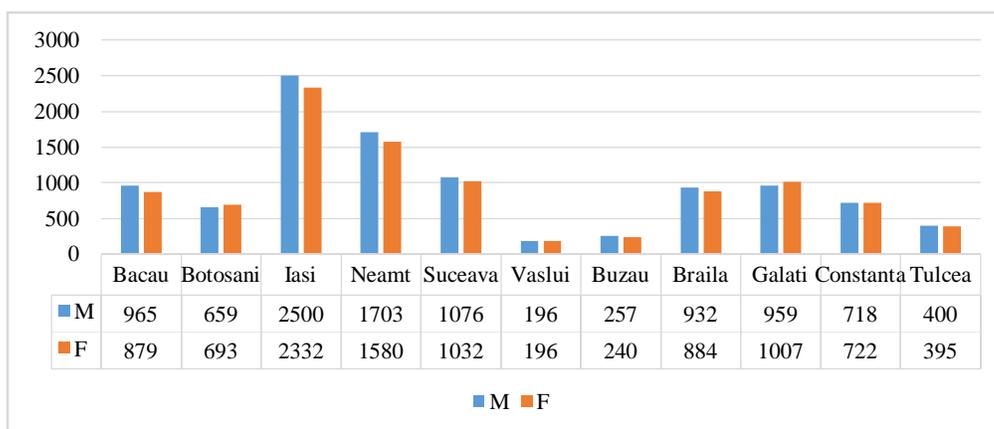


Fig. 1. Number of subjects in the target group for each county and by gender

## Results

The research results were correlated to similar studies conducted in 1972, 1981, and 1994 both in terms of assessment tests for strength and in terms of speed. The upper limb strength was evaluated by push-ups tests and

there is an increase in results compared to 1970 in all 11 counties analysed for male students, and in 9 counties for female students (Fig 2). Relating to the 80s and 90s, the 2012 evaluation recorded values close to the averages observed previously for boys, with a maximum of 13.84 in Botosani and a minimum of 10.54 in Buzau. As regards girls, there is a downward trend in upper limb strength, except for school girls in Buzau county.

Regarding the strength from the torso muscles, the assessment was carried out by raising the trunk lying face-down test, there were higher rates than the previous evaluations both in girls and boys (Fig 2).

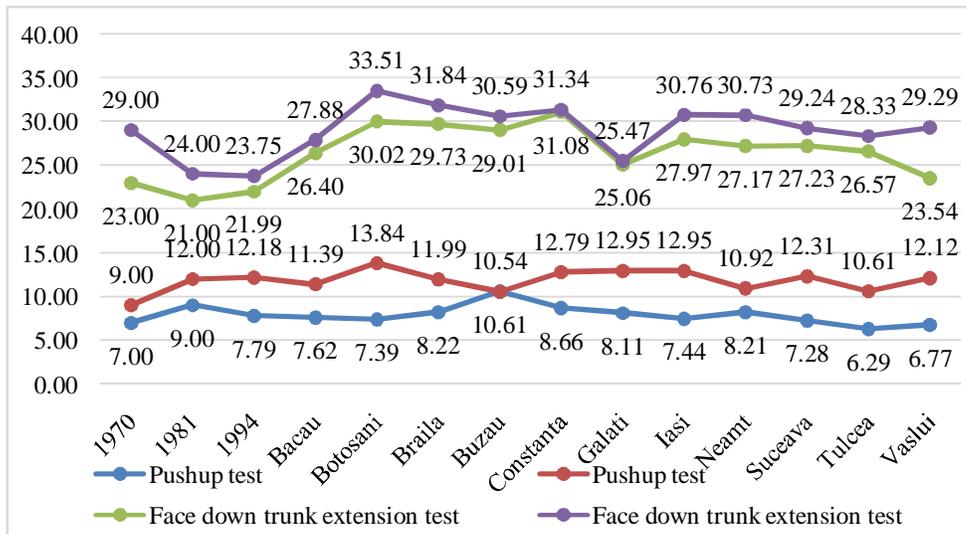


Fig 2. Results recorded for push up test and for face down trunk extension test

For the running speed (shuttle) 5x10m and jumping length tests, the average results in the two development regions analysed were correlated to the minimum scales at SNSE level that allow pupils to get grades of 5 (five) (Fig. 3). As regards the push-up test, values below the minimum scale were recorded for boys, while girls recorded values over the SNSE both in the northeast (135cm) and in southeast (134 cm). Regarding the speed test (Fig. 3) it is found that students in the two regions have similar results to those of SNSE, in terms of minimal scales in boys and below those, in girls, in both development regions.

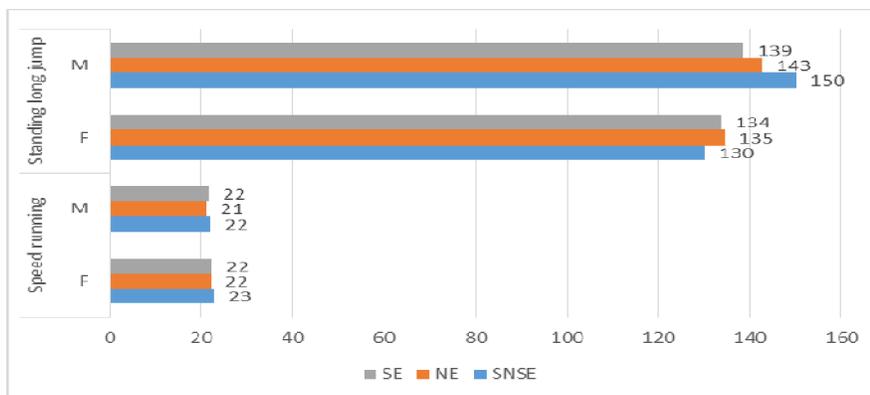


Fig 3. Comparative results at speed running test and long jump test (Sistemul Național Școlar de Evaluare la disciplina Educație Fizică și Sport, 1999)

The analysis of the somatic measurements revealed results that fall between the values recorded in the United States studies for students aged 11 to 12 year old. (Kuczmarski RJ, et al., 2002) Regarding the height of the students, note there are higher values in girls compared in boys, something that is consistent in agreement with the peculiarities of growth and development (Figure 4). The differences between the two genders are shrinking in terms of weight, as there are counties where the average weight of boys exceeds that of girls (Figure 5).

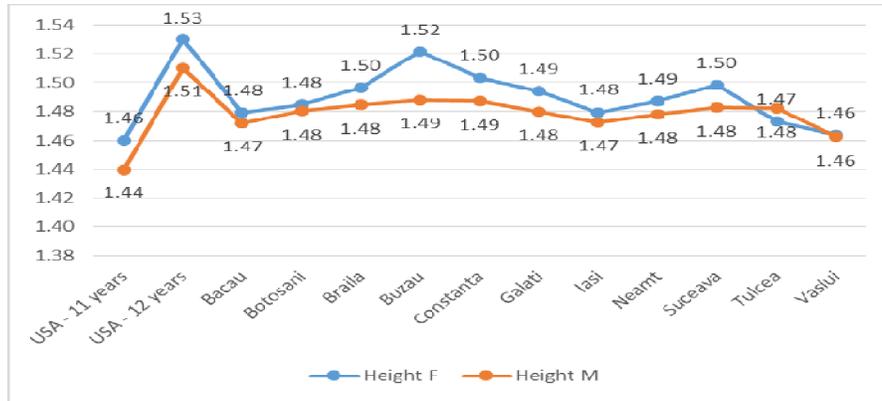


Fig 4. Comparative results at height measurement

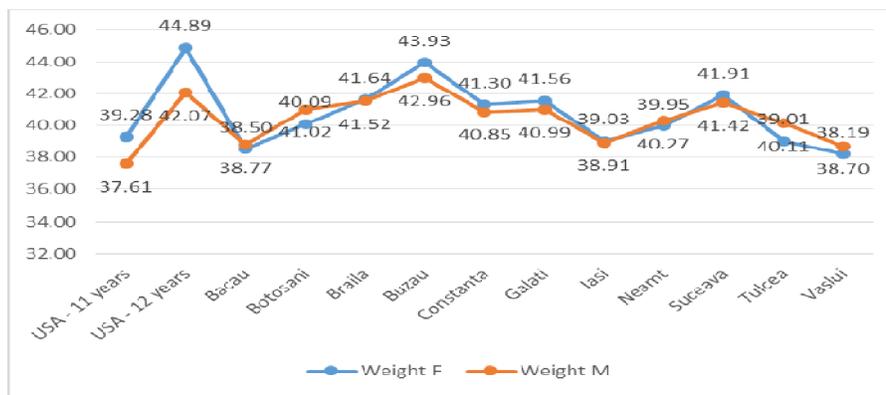


Fig 5. Comparative results at weight measurement

In order to establish the relationship between the somatic development, motility levels of students and living standards, correlation coefficients were calculated, between the ranks obtained in each county in each of the three indicators (tables 1 and 2).

Table 1. Data on the ranks in living standards, in motor aptitude tests and somatic measurements in Eastern side of Romania

County	GDP per capita (Euro)	Net average salary (Ron)	Un employment (%)	Life expectancy (years)	Ranking Living standard	Ranking Motricity tests 5th class	Ranking Height Measurement	Ranking Weight Measurement
Bacau	4626	1236	6,58	72,3	3	7	10	10
Iasi	5435	1411	5,25	73,6	10	11	7	6
Botosani	3324	1078	4,56	72,6	9	8	4	3
Neamt	3433	1119	5,63	73,6	4	10	1	1
Suceava	3843	1065	5,67	74,3	1	9	2	5
Vaslui	2385	1084	10,48	72,5	6	6	5	4
Brăila	4434	1124	6,6	73,5	2	3	9	9
Buzău	4483	1257	7,98	73,6	8	3	6	7
Constanța	7771	1448	4,67	72,7	7	5	3	2
Galați	4704	1330	9,14	73,1	5	1	8	8

Tulcea	4748	1327	6,25	71,6	11	2	11	11
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Table 2. Correlations coefficients between the rank of living standards, motor aptitude tests and somatic measurements

Pearson Correlation	Living standard	Motricity tests	Height Measurement	Weight Measurement
Living standard	1			
Motricity tests	-0.08895	1		
Height Measurement	0.218182	-0.56036	1	
Weight Measurement	0.027273	-0.56036	0.936364	1

After calculating the correlations we see that the values of the correlation coefficients are non-significant at  $p=0.05$ , something that allows us to say that there is no correlation between the level of somatic and motor development or between the mand the standard of living (Table 2).

### Discussions and Conclusions

The results provide a relevant picture of the phenomenon, in the frame of some interpretations translated into reference data for professionals in the field of health and education. The study provides arguments for intensifying the efforts to form an active style of life since childhood.

The motor ability of students was analyzed in accordance with previous research and minimum rates of SNSE, and revealed a downward trend in strength level of the limbs and a growth in the trunk muscle mass (Stănescu, Ciolcă and Stoicescu, 2015). The speed test analysis also highlighted values below the minimum scale of assessments used for physical education.

Given the above, our paper highlights the downward trend of the motor ability of 11-12 year old students.

The somatic measurements analyzed reveals similar values with those recorded in other countries, both in terms of height of the subjects, and in terms of weight.

The lack of correlation between the somatic and motor development as well as the living standards shows that socio-economic environment does not influence the motor ability of the students. The results lead us to believe as appropriate for reconsideration the minimum rates and the possibility to change the number of hours of physical education in the core curriculum, by increasing it.

In order to obtain a more detailed picture of the bio-motor potential of the school population of Romania, we believe it would be appropriate to conduct a number of comparative analysis between evaluations of rural students and urban students from a larger number of counties.

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## ASPECTS ON THE MOTOR AND PSYCHOMOTOR LEARNING AT CHILDREN WITH INTELLECTUAL DISABILITIES

Aspecte privind învățarea motrică și psihomotrică la copilul cu dizabilități intelectuale

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**Rezumat.** Datorită caracterului său interdisciplinar extrem de complex, învățarea motrică studiază mecanismele de producere, comandă și control a mișcărilor, modalitățile de formare a deprinderilor și priceperilor motrice, precum și factorii care condiționează aceste acțiuni. Învățarea motrică și psihomotrică adresată copiilor cu dizabilități intelectuale constă în dezvoltarea progresivă a achizițiilor dobândite, prin accentuarea dimensiunilor afectiv-atiitudinale și acționale ale formării personalității lor, impunând recunoașterea elementelor care condiționează execuția tipurilor de mișcări fundamentale, impunând astfel profesorului stabilirea unor sarcini adecvate și exploatarea condițiilor de mediu, care să asigure stimularea copilului.

*Cuvinte cheie:* conceptul de învățarea motrică, procesul perceptiv- motric, dizabilități intelectuale.

**Abstract.** Because of its extremely complex interdisciplinary nature, the motor learning studies the production mechanisms, commands and movement control, the formation of habits approach and the motor competences, and the factors which condition these actions. The motor and psychomotor learning for children with intellectual disabilities consists in the progressive development of the obtained acquisitions, by emphasizing the affective-attitude and actions of their forming personalities, imposing the teacher to settle adequate tasks and exploiting the environment conditions, which will assure the child's stimulation.

*Keywords:* the motor learning concept, the motor-perceptive process, intellectual disabilities.

### Introduction

Motor learning has stimulated many specialists, interest by being one of the most significant forms of human learning. It has been researched and studied from the point of view of many sciences and it propounds a vast and interesting field of investigation of the systems which are the basis of its formation, but also of the intervention which is intended for increasing the efficiency of human motor actions and educational intercession in general.

During the child's evolution, the motion has an essential role because, its action influences not only the coordination of sensorial-motor inner intelligence, but also the other aspects of intelligence. Motion interferes in all levels of cognitive functions developments: from perception, to the motor-sensorial schemes and from those, to the form of interiorized imitation which is represented by the mental image, by preoperative representations until the primordial operation.

For a child with intellectual disabilities, it is necessary a permanent help in instruction. The activity of the subjects is characterized by a weak group interrelation, because of the low mental and motor level, attaining a communication only between the professor and the student. Because of this premises, motor learning focuses on using the motor-sensorial habits, basic habits and fundamental movement patterns and the development of fitness components.

### The current level in specialty literature

Learning is considered by teachers an assimilation process of knowledge and habits and motor competences formation, necessary for the daily activities. Right from the birth, the motor learning accompanies the man from the initial stage of his development, as a natural motor inbred reaction, activated by the environment stimulation. Piaget (1972: 62) establishes that from birth until 18 months, there exists a stage of the motor sensorial intelligence, considered to be the first stage of motor development. This stage will evolve and grow obtaining the life experience of every single person.

Schmidt (1991:75), defines the motor learning by following a series of characteristics: "motor learning is a set of processes associated with movement or experience which determinates relatively permanent changes in the capacity of stimuli response." In Dragnea A's and Bota A's opinion, the learning is " a phenomenon in which a person achieves new behavior forms, as a consequence of practice. Learning can be perceived as:

- A result of perceptions, habits and routine;
- A process of assimilation mechanisms;
- An operational action;

Horghidan (2000: 140) quotes Fitts and Posner(1969), which consider that” learning starts with a cognitive stage in which the subject understands the tasks and the manner of solving the task and, it has a fast progress. In the second stage, named the associative stage, the movement parts are tied and coordinated by exercising. It is a stage that lasts a lot, comparing with the first, the results are slower, but it finishes with performance”.

Epuran (2010: 50), considers that motor learning” is about behavior acts in which the reactions are dependent on the proprioceptive sensorial components. Because the person reacts in a physical environment, the pure model of motor learning can be found only in the acts in which the gestures are so well known that they can be controlled by the kinesthetic sense”. Motor learning “is important in simple movements articulations, either with instrumental value subordinated in solving tasks or with final value itself like in the case of motor systems in sport activities” (Golu, 2000 *quoted by* Salavastru, 2004: 15).

Other authors think that children cannot learn movements but motor solutions, the subjects, by repeating learn how to combine different movement parameters in order to obtain the purpose. In this way, it is considered that the method is not learned but the rule is improving step by step, resulting in the ability of movement. This way, the idea of movement is not the object of learning, but its result.

### Approached issue

The motor activity of people with intellectual disabilities has characteristics which go from the cleaning stage of the nervous system and their grade of physical development, to the mentally deficient child, being equally a motor deficiency. Like the mental organization is different structurally and functionally from a normal child, the motor organization plan is also different because: the severe distress of the time-space structure, weak coordination of movements in space.

The main method to promote the motor development is by physical exercising, the entire population having physical activities, including for the people with disabilities.

The objectives and tasks of motor activities go hand in hand with the learning and biological activity, having the purpose of well developing, a well functioning capacity, being used to practice physical exercises, excellent moral qualities and last but not least, an optimal state of health.

People with disabilities have lower levels of the cardio-respiratory capacities and slower muscular resistance, associated with higher levels of obesity, comparing with the general population. The repeated physical activity offers children with disabilities psychological benefits, health improvements, body mass reduction and overall improvement of the body functioning, and also the psychological status of the families.

Motor learning and forming some habits generate some problems at people with disabilities. At the basis of motor learning, lay the cognitive processes like in the case of any learning because, the movement consists in nervous stimulation, mental actions, internal actions of the central nervous system and extreme physical movement (Eminovic *et al.*, 2010: 71-74).

Starting from the fact that, motor learning is a part of everyday life, it can be defined as a permanent change, relative to the behavior, which can be achieved by exercising or experience, as a consequence of practice” (Dragnea and Bota, 1999: 149), being seen as:

- A set of processes associated with practice or experience which determine relatively permanent changes in the body’s capacity to respond to stimuli” (Schmidt, 1991, p.153);
- An ensemble of behavioral acts in which the stabilized reactions are dependent on the sensorial components. Because the person reacts in a physical environment, the pure model of motor learning can be found only in those acts in which the gestures are so well learned that can be controlled exclusively by the kinesthetic sense (Epuran and Stănescu, 2010: 50).

Learning starts with a cognitive stage, in which the subject understands the tasks and the method to realize them in a normal way, obtaining a fast progress. In the second stage, named the associative stage, there movement parts are tied and coordinated, by exercising. It is a stage which lasts longer, in comparison with the first one, the progress is slower but it finishes with performance” (Fitts and Posner, 1969; Horghidan, 2000: 143).

The factors that are significant in organizing the motor learning are:

- The person’s characteristics. It is important that in the learning process in general, and in motor learning, to take in consideration the person’s characteristics which is learning a new habit, by matching as more as possible the motor learning content with his particularities;

- The activity's characteristics. The complexity, the duration and integration of the activity, will affect the rhythm of learning and also the selection of teaching methods;
- The characteristics of those who teach and also the learning methods. The success of the learning process depends mostly on the professor's characteristics. The teaching experience and then, the one of their own performances but also other characteristics of personality and typical behavior (patience, the ability to clearly explain, support) can motivate and help those who are exercising or can react in reverse, burdening their learning. Furthermore, if a person who teaches a motor ability has no knowledge be it theoretical or methodological about the activity, or he is not familiar with the characteristics of development specific to a group, then the principle and methods of motor learning and teaching can slow the learning process or can even make it inefficient.

### Phases of motor learning

A newer model of learning emphasized in the specialized literature presents two main stages of learning, seen from the learner's point of view (Eminovic, 2014: 195):

- *Initial stage.* In this stage, the learner has two purposes:
  - Coordinate the movements. The child tries to execute the general movement, developing those characteristics of movement which match with the conditions in which is taught;
  - To make a distinction between the regular and irregular conditions of the execution. The child is testing which characteristic of movement corresponds or not, with the environment conditions/ rules in exercising, being placed in a problematic situation in which he would like to obtain the same result; at the end of this phase, the practicing effect must be concluded in a coordinated movement;
- *Advanced stage.* In this stage, the learner must realize three things:
  - To develop his ability to adapt to actual conditions;
  - To begin realizing consciously the purpose by movement improving;
  - To make economical movements, with a minimum effort.

Gentile (2000:111-187) Argues that these three characteristics of a learning motor phase two depend on characteristics and accuracy required. All version meaning his motor skills, as a result of learning could be open or closed.

Learning a closed motor skill involves acquiring primary movement, acquired in the initial stage of learning. The result could be achieved by improving the model, resulted in the improvement of the technical components of movement until automation is achieved with minimal conscious effort (Magill, 2007 *quoted* Gentile, 2000).

The person with intellectual disability movement must adapt continuously to changing conditions of the environment, combining and harmonizing the temporal and spatial constraints of execution. Learning motor skills requires a variety of movements open primary in the initial phase of learning. The movements require a separate planning an action and specific training of learners. Timing is a critical factor for open habit, because it determines the preparation and execution of processed movements. Their learning involves rapid switching of attention of the learner to various aspects of the environment, and then the ability to anticipate conditions have changed and the ability to respond quickly to these changes before they happen.

In the early stages of learning driving route cortical - thalamic - cortical - cerebellum is more active, while progress in motor learning emphasizes the increased activity in the basal ganglia and prefrontal cortex of the parietal lobes (Doyon *et al*, 2003: 252-262) observed changes in brain activity studies, which are associated with progress. Research has also shown that complex motor skill learning increases the number of synapses in cerebella cortex (Kleim *et al.*, 1998: 274-289).

Motor behavior of people with intellectual disabilities during learning experience changes. In the early stages of learning there are several mistakes that children with intellectual disabilities have, but they are relatively easy to fix; when the child adopts the basic structure of motion, reduces the number of mistakes, but they are finer and more difficult to correct because it is the details that require movement of the movement, expressed in the functional synergy of body parts working together. The execution of motor skills by people with intellectual disabilities in the beginning, irregular movements that involve multiple muscle groups work than necessary; also difficulties in coordinating and sequential activation of different muscle groups involved in the movement, which is a consequence of the reorganization motion control system (Magill, 2007: 47). Motor learning research in the area have shown that there are differences in the ability to focus in the initial phase distribution compared to the final (Gray, 2004: 42-54). Beginners have a lower capacity to deliver efficient attention, while advanced people

pay less attention to the movement patterns (which are automatic) and can pay more attention to the practicing environment.

An essential role in learning motor skills and controlling the motor habits is the sight, which is the dominant sense of man. During learning, the ability to use visual information changes. Studies show that beginners focus visually less important aspects of the environment (Savelsbergh *et al.*, 2002: 279-287) and as they progress, they know what to focus on in order to have a better performance. By improving skills, spatial and temporal characteristics of the movements involved in some abilities cause the child to easily adapt their execution to spatial characteristics; Furthermore, it also provides a speed and then acceleration of the movement.

Motor learning requires a large number of repetitions; some sources mention that driving skill will be well served by 10,000-15,000 repetitions (Schmidt and Wrisberg: 2000).

### Conclusions

Motor activity of children with intellectual disabilities presents particularities arising from the state of maturation of the nervous system and their level of physical development in some way mentally deficient child is equally a defective motor.

Personal body experience must be valued during the late preschool and primary school years, first to make the child acquire the concepts and then to experience them in various conditions or for use in rehabilitation, as appropriate. Due to peculiarities of children posed with intellectual disabilities, we believe that the greatest efficiency in the rehabilitation / development / training of motor skills they have strategies multisensory learning by imitation and learning.

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## ROLE OF THE EXTERNAL ENVIRONMENT IN THE DEVELOPMENT OF THE PRIVATE SPORTS ORGANIZATION

Rolul mediul extern în dezvoltarea organizației sportive private

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**Rezumat.** În procesul de management al clubului sportiv de drept privat, cunoașterea și valorificarea, pe un plan superior, a factorilor de mediu, asigură elaborarea de strategii și politici realiste cu grad ridicat de fundamentare științifică. Desfășurarea activităților specifice în condiții de calitate și profitabilitate nu este posibilă fără conceperea și realizarea unor strategii adecvate, în care evoluția factorilor de mediu extern se impune a fi inclusă. Mediul extern (ambiant), exercită o serie de influențe asupra managementului clubului sportiv de drept privat, prin intermediul unui **complex de factori** cu acțiune directă asupra activităților specifice. În acest complex de factori evidențiem marketingul sportiv, care poate fi utilizat cu succes de către manager în procesul de conducere. Rezultatul analizei mediului extern al clubului sportiv privat va permite efectuarea unor judecăți de valoare privind: poziția clubului sportiv privat în cadrul industriei sportive locale și naționale, măsura în care se înscrie în tendințele specifice activităților sportive, forța competitivă a clubului, capacitatea de a fructifica oportunitățile și de a înfrunța cu succes pericolele existente sau potențiale.

Cuvinte cheie: management, strategii, marketing, servicii sportive.

**Abstract.** In the management process of the private sports club, knowing and valuing, on a higher plane, the environmental factors, ensure the development of realistic strategies and policies with a highly scientific foundation. The execution of specific activities in conditions of quality and profitability is not possible without the design and implementation of some appropriate strategies, where the development of the external environmental factors is required to be included. The external environment (ambient) exerts a series of influences over the private sports club management through a **complex of factors** with direct action on the specific activities. In this complex of factors we highlight the sports marketing, which can be used successfully by the manager in the management process. The external environment analysis result of the private sports club will allow some value judgments on the: private sports club position in the local and national sports industry, insofar as it falls within trends specific to sports activities, competitive strength of the club, ability to capitalize on opportunities and successfully meet existing or potential hazards.

Keywords: management, strategies, marketing, sports services.

### Introduction

In the current socio-economic context of transition to the market economy, tackling the external environment and the interdependence between it and the private sports organization called private sports club, is an issue of utmost importance, to which solution the scientific management has a decisive role, in the conditions in which the knowledge of the endogenous and exogenous variables influencing the sport organization is likely to ensure its effective functionality in a tough competitive environment (Lador and Mihailescu, 2008). The private sports club evolution in modern society is marked by amplifying the interdependencies with the environment in which it operates. This evolution is marked by the private sports club nature, designed as an open system reflected both in terms of “inputs” and of “outputs” and knowing an increased variety and intensity.

In the management process of the private sports club, knowing and valuing, on a higher plane, the environmental factors, ensure the development of realistic strategies and policies with a highly scientific foundation. The execution of specific activities in conditions of quality and profitability is not possible without the design and implementation of some appropriate strategies, where the development of the external environmental factors is required to be included (Comanescu, 1999).

In the context of the external environment locally and nationally, the private sports club, in its operation and development, envisages meeting certain necessities by continuously attracting and using resources, exploited by the potential drawn into the economic circuit, further becoming progress factors that will allow achieving performances.

### Current level reflected in the specialty literature

The sports management practice showed that only in so far as the needs and opportunities of the external environment are known, the overall activity of the private sports club is improved by enhancing the functionality and efficiency. In the opinion of some sport specialists (Albon and Epuran, 1976; Bota, 2007), for solving the

various problems we must use the scientific information in order to harmonize the managerial functions and improve the quality and efficiency of the governing bodies in sports institutions.

As shown, the external environment (ambient) exerts a series of influences on the private sports club management through a *complex of factors* with direct action on the specific activities, but also on those micro-economic providing relevant information regarding sports customers needs and competition mechanisms typology.

In this complex of factors we highlight sports marketing, which seen as theory, practical activity and with essential instrument with major implications in the activity of any sports organization, can be successfully used by the manager in the management process.

Marketing, represented by the action methods and techniques used to achieve the management objectives, is a social and managerial process by which the sport organization obtains what he wants and needs, by creating an educational sports system, which aims to: maximize sports performance, increase sports consumer satisfaction and increase welfare. Initially, sport marketing was not regarded as a distinct area, but as a new area of application of marketing. However, during the transformation of sports into an industry, individualization of sports marketing as an area in its own right emerged as a necessity. Assuming that sports marketing requires the involvement of two major categories of organizations (sports and non-sports) is very important to highlight the place each occupies and the role they play in the sports industry.

Sports industry is defined by some experts (Pitts and Stotlar, 1996) as the market where the products / services are offered to the buyers as physical, sports, recreation activities or other elements related to leisure that can be goods, services, people, places or ideas.

The two authors present sports industry segmentation into three categories:

- 1) Obtaining sports performances and identification of sport entities that can perform this (be it the obtaining of their sport performances, be it appreciating those performances as a spectator); this category refers, in fact, to *sporting services*;
- 2) Sports products used to improve quality of services provided by the *sports organizations*;
- 3) Promoting sport products and services using various *marketing tools*.

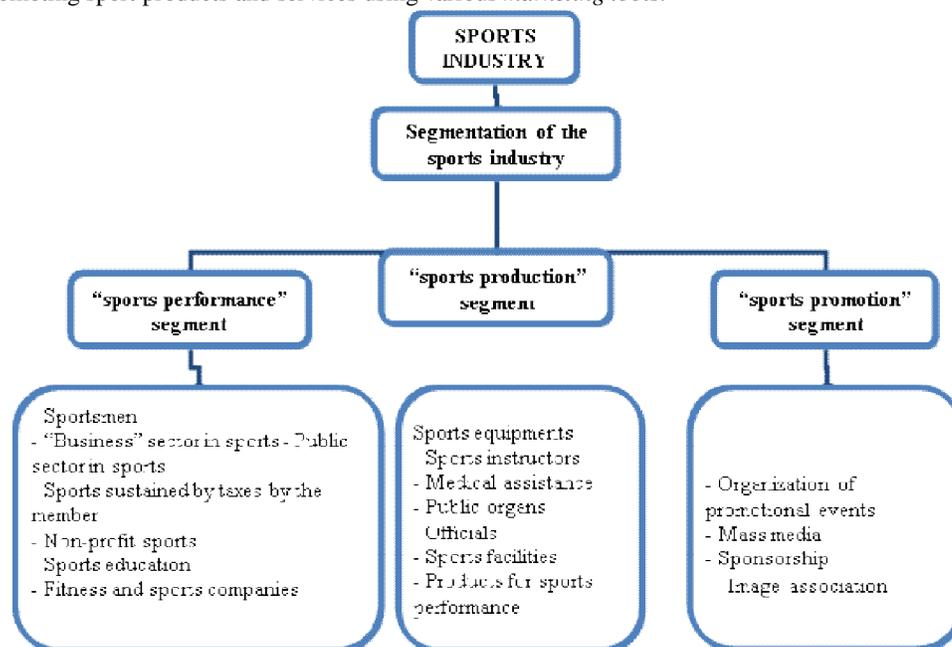


Fig. 1. Classification of the sports industry components according to the model (Pitts & Stotlar, 1996)

Source: Van Heerden, (2001)

The use of tools specific of strategic management, and the formulation of strategic action choices, will lead to an efficient adaptation and a long-term development of the private sports organization, in accordance with the requirements of the environment in which they operate.

### Approached problematic

The PEST analysis (political, economic, social, technological) helps to identify long-term external influences on sports organization and thus lead to “determine” the vision. The four change promoters do not act independently or in parallel but in interaction and generate unpredictable changes (Fig. 2).

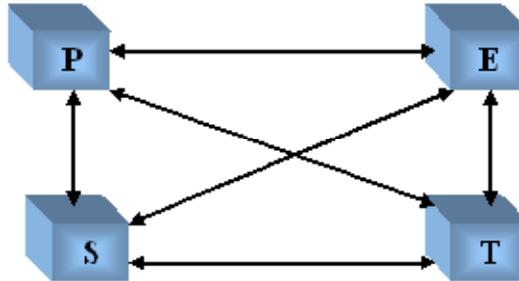


Fig. 2. Interaction of the four change promoters (Smith, 1996)

The external environment analysis result of private sports club will allow the execution of some value judgments on: the position of the private sports club in the local and national sports industry, insofar as it falls within specific sports trends, the competitive strength of the club, the ability to capitalize on opportunities and successfully meet existing or potential hazards.

### Organizing and conducting research

The strategic analysis of the implementation of a performance management focused on creating value for all recipients in the Sport Club “Laguna” Constanta was focused on the analysis of the external environment. Although the external environment is dynamic and complex, its monitoring is essential, enabling the identification of threats and opportunities.

In conducting the PEST context analysis of the private sports Club “Laguna” Constanta, I started from the following assumptions:

- The sport organization is a structural element of the national sports system operating within a market economic mechanism, within which the external environment factors manifest with different intensities;
- The knowledge and monitoring of the external environment is extremely important in applying the management strategy of the private sports Club;
- The private sports organization depends on the ability of the club management to harmonize its functioning with the specific and the needs of the environment to which it belongs, given that this sport organization must constantly adapt to the community to which he belongs, placing itself in its service.

The PEST analysis was aimed at the political, economic, socio-cultural and technological factors locally and nationally existent, which influence or may influence the club evolution.

*1.POLITICAL FACTORS: refer to all the major local and national policies aimed at sport in general.*

*2.ECONOMICAL FACTORS: concern, on the one hand, the development of the club, on the other hand the local and regional economic context in which the club operates its sports training programs.*

*3.SOCIAL FACTORS: are characterized by the highest degree of complexity, and refer to the changes that occur within the community. These changes apply to social attitudes, social values, changes in the sports system and the lifestyle. The demographic changes, as the birth rate, population size, age structure and population mobility, affects the structure of the potential athletes - (the number of preschool children who are guided and selected for different sports branches) and the marketing strategies of the private sports club.*

*4.TECHNOLOGICAL FACTORS: are the forces that produce the greatest impact. The technological evolution makes the distinction between the competitors (a source of the competitive advantage). The innovations in applications generating knowledge and use of technologies in information and communication are significant*

factors for sports organization management, allowing its integration into the dynamic process of management professionalizing.

Table 1. Factors that influence the private sports club evolution locally and nationally

No. Pos.	Areas of analysis/factors that influence the club evolution	Contextual level	Relevant aspects
1	Political factors	National	Legislative harmonization measures and Romanian sports system compatibility with the European standards. Law 69/2000; Volunteering Law; Sponsorship law; Fiscal Code; Labor Code; Civil Code; Law 320; Education Law 1/2011; Law 195/2006
2		Local	Various legislative measures exercised by the county Councils and local Councils regarding sports bases in the patrimony or under local and county administration.
3	Economical factors	National	The national economic situation does not allow the optimal financing of the sport system so there is uncertainty about the evolution of the sports performances.
4		Local	The investments from the local authorities on sports infrastructure are low, which generates stagnation in the development of sports programs and projects.
5	Social factors	National	The general economic situation is reflected socially by emphasizing the phenomena that generates social insecurity and instability.
6		Local	The models of individual and group behavior that reflect attitudes, values and customs. The industry labor migration in the European space can jeopardize the sustainability of programs initiated in partnership. Reducing of the basis for selection of potential athletes due to the accented degradation process of the population health condition.
7	Technological factors	National	The absence of a national database of sports infrastructure programs essential to the promotion and effective implementation of a sports development strategy nationally.
8		Local	Computerization and creating applications that reduce the workload and streamline the registration process of athletes, storage and archiving sporting activities specific data. Creation of the data application “Laguna”, leading to more efficient sports training activity for children with real skills for performance sport.

The PEST analysis results, materialized in identifying the factors, constantly changing, which have an impact on the private sports organization activity, will be used to plan, organize and promote sports service packages to achieve the organizational goals.

### Conclusions

The knowledge of the external environment structure and requirements in which the sports club operates are a great importance for connecting the activity to its dynamic.

Depending on the particularities of the political, economic, social, technological factors existing nationally, regionally and locally, the private sports club aims to develop the demand for certain sports products and services, to renew with high frequency the offer of specific programs, to improve the distribution of its services, to achieve effective sports projects and actions.

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## ASPECTS REGARDING THE LEVEL OF STABILITY SKILLS IN CHILDREN WITH DOWN SYNDROME AGED 3 TO 8 YEARS

Aspecte privind nivelul deprinderilor de stabilitate a copiilor cu Sindrom Down cu vârste cuprinse între 3-8 ani

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**Rezumat.** Copiii, cu dizabilitatea intelectuală reprezintă o categorie numeroasă de persoane (3% din populația țării) ale căror afecțiunile cerebrale, suferite în perioada timpurie, se repercutează asupra întregii lor activități sociale și profesionale. Dizabilitatea intelectuală reprezintă unul dintre fenomenele cele mai complexe datorat, cauzelor multiple care o determină, diferențelor de gravitate, precum și deficiențelor supraadăugate. Activitatea fizică sistematică le oferă copiilor cu Sindrom Down beneficii privind îmbunătățirea sănătății, dezvoltă abilități motrice posturale, locomotorii și de manipulare a obiectelor, îmbină fenomenele de natură psihică cu cele de natură motrică determinând reglarea comportamentului și nu în ultimul rând favorizează incluziunea și integrarea socială. Plecând de la aceste premise, prin această lucrare dorim să evidențiem faptul că educația psihomotrică timpurie realizată cu ajutorul programelor stimulative elaborate special pentru copiii cu Sindrom Down cu vârste cuprinse între 3 respectiv 8 ani este eficientă în condițiile în care se intervine continuu, sistematic și individualizat.

*Cuvinte-cheie:* dizabilitate intelectuală, deprinderi de stabilitate, sindrom down

**Abstract.** Children with intellectual disability represent a numerous category of persons (3% of the population of the country), whose brain damages, occurred in the early period of life, have an impact on their social and professional activities. Intellectual disability is one of the most complex phenomena, due to the multiple causes that determine it, the differences in gravity and also the extra added disorders. Systematic physical activity offers the children with Down syndrome benefits related to health improvement, develops postural motor, locomotor and object-handling abilities, combines the psychic and motor phenomena by determining the behaviour regulation and, last but not least, facilitates social inclusion and integration. Starting from these premises, we want to emphasize through this paper the fact that early psychomotor education, achieved by means of stimulating programmes purposely designed for children with Down syndrome aged 3 to 8 years, is efficient under the conditions of a continuous, systematic and individualized intervention.

*Keywords:* intellectual disability, stability skills, Down syndrome

### Introduction

Throughout the lifespan, we are confronted to a series of challenges which reflect the education, learning and utilization of motor skills. This process starts early in life, with gaining control over the body posture and the grasping-catching skills, and continues with acquiring the movement and manipulation skills (Dragnea *et al.*, 2006: 43).

The starting point for learning all the other types of skills that the child will frequently use in the playful, recreational and sport activities is represented by the fundamental skills.

There is a wide range of skills, but we shall describe in detail only the stability skills, namely the posture and balance, as basic skills for learning/forming the other skills during both the physical education and the kinetotherapy lessons.

The general attitude of holding a position that characterizes a space is represented by posture (bipedal position, in the case of humans), in which transitory positions, such as the seated state, can also be included. It has the function of keeping balance of the body (the gravity centre inside the support polygon) through correction mechanisms and preparing it for actions and/or disruptions of balance that may occur. The muscular-skeletal and joint characteristics, together with the muscle tone quality, determine this function, which depends on the interactions of reflexes that act to maintain the bipedal posture and on the action of nerve structures of the brainstem, cerebellum, basal ganglia and cortex. Balancing-rebalancing is formed as a result of a learning process that starts since the first months of life and whose priority objective will be to predict or anticipate postural adjustments, by avoiding thus major imbalances. Neuromuscular activities that maintain a pre-established posture are regrouped into balancing mechanisms, which have as an essential function the resistance against the gravity forces.

The amplitude of the oscillations is highlighted while holding the bipedal position. In this sense, researchers have recorded the length and area of the gravity centre shifting, with the eyes open or closed. Calculating the ratio between the situation in which the eyes are closed and that in which the eyes are open (Romberg's ratio), one can assess the role of vision in balance keeping: if the ratio is supra-unitary, then the vision is the one that centres the subject, which frequently occurs in children, but also in adults (Hayes and Riach, 1989: 97-127). In the case of posture disruption or large oscillations, three correction stages are present: viscoelastic resistances in tendons and

muscles, which try to slow down, in the first phase, the body sway movement, before the muscle contractions intervene (within a time interval of 70 to 100ms, in the case of encephalic responses), with the aim of stopping the sway movement through the simple return of the body to the initial position. If the disruption of balance is very high (risk of falling), the rebalancing movements, by displacing the body towards the direction of imbalance, will emerge under the encephalic control.

Through the maintenance tone (related to balance or attitude), the bipedal posture compels the human body to overcome the gravity forces and to ensure the maintaining of static or dynamic balance, which coincides with the basic muscle tone and manipulates the balancing reactions, by means of which the neuromuscular system fixes the gravity centre of the body inside the support polygon and provides a support for the execution of motor actions. In the bipedal position, we slightly bend forward, backward, due to the contractions of the leg extensor muscles which, in the first instance, will stop the forward fall, and those of the leg flexor muscles which, in the moment immediately after, will stabilize the body. The motor act is sustained by a higher tone in the action or expression (Rigal, 2002: 427-428).

The exertion of motor neurons of the extensor muscles and the relative inhibition of motor neurons of the flexor muscles ensure the postural tone. Indications about a possible body imbalance are provided by the receptors located in the eyes, internal ear, muscles, muscle tendons, joints, toes and skin of the foot sole. Visual, labyrinthine and kinaesthetic information provides data to the nervous system about the shift of the gravity centre, which determines, in its turn, appropriate movements for holding a stable posture. Sensory systems (visual, labyrinthine and kinaesthetic ones) interact permanently, following the model of the complex circuits in the spinal cord, brainstem, cerebellum and cortex, in order to be able to reproduce adapted motor feedbacks.

### Material and methods

By organizing and conducting this research, we aim at the motor development of children with Down syndrome, for increasing efficiency of the stability-related fundamental motor skills, so much exerted in daily activities. The research subjects were a group of 19 non-institutionalized children with Down syndrome aged 3 to 8 years, who carried out intensive physical activities over a 3-month period, two lessons a week, each child benefiting from the support of a volunteer from the Special Olympics Foundation, activities taking place under the auspices of the Young Athletes Programme, coordinated by this non-profit organization, in cooperation with the UNEFS Bucharest. The general research methods used are the following: study of the specialty literature, observation, experiment, data processing and interpretation. Methods for assessing the skill level through the tests included in the Young Athletes Programme:

Table 1. *Tests for the stability skills- balance and muscle control*

Skill	Procedure	Way of assessment
1. Standing on one leg for 1sec. to 5sec.	Demonstration: Standing on one leg with knee of the free leg bent and hands on the hips	No: The child needs help to stand on one leg or performs this task for less than 1 second.
	Verbal command: Do the same as I do: "put your hands on your hips and stand on one leg". Observation: It is observed the duration over which the child can stand on one leg.	Yes: The child adopts the posture according to indications.
2. Standing on one leg for 6 sec. to 10sec.	Demonstration: Standing on one leg with knee of the free leg bent and hands on the hips	No: The child needs help to stand on one leg or performs this task for less than 6 seconds.
	Verbal command: Do the same as I do: "put your hands on your hips and stand on one leg". Observation: It is observed the duration over which the child can stand on one leg.	Yes: The child adopts the posture according to indications.

3. Standing on tiptoes for 1 sec. to 5sec.	<p>Demonstration: Standing on tiptoes with arms raised up</p> <p>Verbal command: Do the same as I do: “raise your arms up and stand on tiptoes just like me”.</p> <p>Observation: It is observed the duration over which the child can stand on tiptoes. If the child does not know the body segments, you show him/her where the tiptoes are and possibly he/she takes off the shoes if they are rigid.</p>	<p>No: The child needs help to stand on tiptoes or performs this task for less than 1 second.</p> <p>Yes: The child adopts the posture according to indications.</p>
4. Standing on tiptoes for 6 sec. to 12sec.	<p>Demonstration: Standing on tiptoes with arms raised up</p> <p>Verbal command: Do the same as I do: “raise your arms up and stand on tiptoes just like me”.</p> <p>Observation: It is observed the duration over which the child can stand on tiptoes. If the child does not know the body segments, you show him/her where the tiptoes are and possibly he/she takes off the shoes if they are rigid.</p>	<p>No: The child’s heels remain on the ground or he/she moves with slow steps or stays on the tiptoes for less than 6 seconds.</p> <p>Yes: The child stays on tiptoes with the arms up without moving for 6sec. to 12 sec. or more.</p>
<i>Stability skills</i>		<i>Overall “yes” responses</i>

## Results

The motor development level and the rate of progress were emphasized using the indicators of central tendency and the t-test of significance.

Table 2. Statistical indicators for the stability skills- initial and final testing

Statistical indicators	Stationary Initial testing	Stationary Final testing
Mean	2.15	3.31
Mean deviation	1.00	0.71
Maximum	4	5
Median	2	3
Minimum	0	2
Mode	3	3
Standard deviation	1.16	0.88
Coefficient of variability	54.09	26.69
Student’s dependent t-test	4.97	0.0001

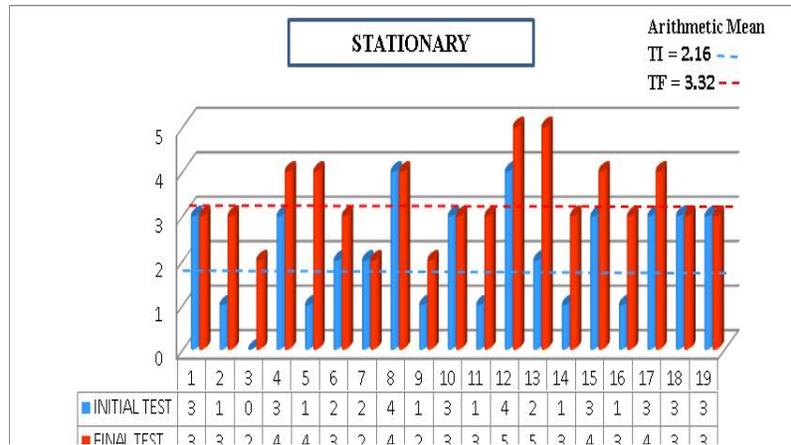


Fig.1.Results obtained by the children at the initial and final testing applied for the stability skills

For the **stability skills**, between the initial and final testing, it was recorded **an increase by 1.15 units**, which was **statistically significant** ( $t= 4.97, p=0.0001, p<0.05$ ).

The degree of dispersion in the series represented by the “ $\sigma$ ” standard deviation has a value of 1.16, for the initial testing, and 0.88, for the final testing.

The coefficient of variability (Cv), at the initial testing, has a value of 54.09%, and a value of 26.69%, at the final testing, these aspects highlighting the fact that there is no homogeneity at the group level.

Table 2. Statistical indicators for the “standing on one leg” skill-initial and final testing

Statistical indicators	Dynamic balance	Dynamic balance
	Initial testing	Final testing
Mean	0.68	1.05
Mean deviation	0.50	0.29
Maximum	2	2
Median	1	1
Minimum	0	1
Mode	1	1
Standard deviation	0.58	0.52
Coefficient of variability	0.85	0.49
Student’s dependent t-test	2.68	0.01

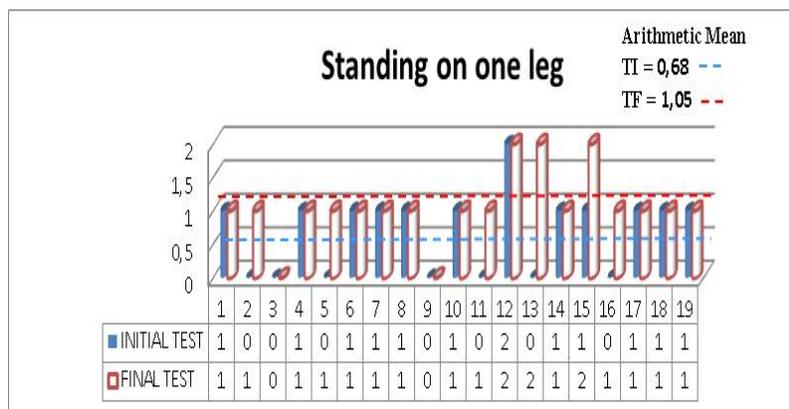


Fig.2. Results obtained by the children at the initial and final testing applied for the “standing on one leg” skill

Holding the “standing on one leg” position proves to be extremely difficult at the initial testing for one third of the subjects, only one of them managing to maintain this posture without problems. It is to mention that at the final testing only two of the children have not been able to acquire this skill. The t-test values indicate a significant difference between the two testing phases (Fischer’s  $t = 2.101 < t = 2.68$ ).

Table 3. Statistical indicators for the “standing on tiptoes” skill- initial and final testing

Statistical indicators	Dynamic balance	Dynamic balance
	Initial testing	Final testing
Mean	0.68	1.26
Mean deviation	0.50	0.46
Maximum	2	2
Median	1	1
Minimum	0	1
Mode	1	1
Standard deviation	0.58	0.56
Coefficient of variability	0.85	0.49
Student’s dependent t-test	4.15	0.00

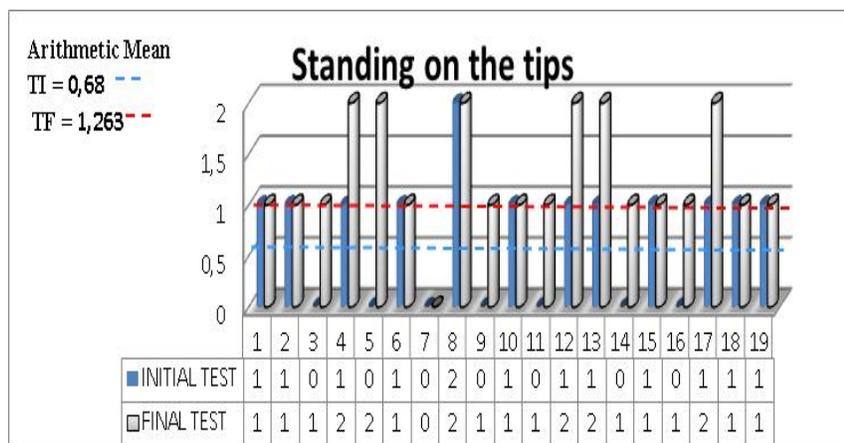


Fig. 3. Results obtained by the children at the initial and final testing applied for the “standing on tiptoes” skill

At the initial testing, standing on tiptoes was problematic for the same subjects who had not managed to hold the “standing on one leg” position, but at the final testing, we notice very good results, one third of the children managing easily to keep this posture, only one child being unsuccessful. The dependent t-test highlights a significant difference in this case (Fischer’s  $t = 2.101 < t = 4.1$ ).

## Conclusions

Investigating the initial level of motor capacity in non-institutionalized children with Down syndrome aged 3 to 8 years has revealed the fact that they present difficulties at the level of stability skills, many of them being unable to stand on one leg or on tiptoes (one third of the subjects, usually the same ones). Children have made progress at the end of the 3 months of intensive and individualized preparation, recording better values at most of the applied tests and presenting statistically significant differences between the two testing stages. The group heterogeneity has also left its mark on the rate of progress recorded by the children throughout the months of preparation, but all subjects have recorded a positive evolution, not only at the motor level, but also at the emotional and social ones.

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## THE VISUOSPATIAL PROCESSING DURING MIDDLE CHILDHOOD IN TAEKWONDO. A NEUROPSYCHOLOGICAL APPROACH

Procesarea vusuospațială în timpul copilăriei mijlocii în taekwondo. O abordare neuropsihologică

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**Rezumat.** Procesarea visuospațială reprezintă capacitatea individului de a vizualiza. Scopul acestei lucrări este de a oferi informații relevante despre influența practicării Taekwondo-ului (TKD) asupra nivelului de procesare visuospațială în timpul copilăriei mijlocii. Studiul a fost realizat pe un număr de 15 copii, cu o medie de vârstă de 8.4 ani (+/- 1.9). În evaluarea. Pentru evaluarea nivelului de dezvoltare visuospațială a fost utilizată bateria NEPSY: O Evaluare a Dezvoltării Neuropsihologice pentru populația românească. Din bateria de teste a domeniului procesării visuospațiale au fost utilizate următoarele subteste: Copierea Desenului, Săgețile, Construcția din Cuburi, Găsirea Drumului. După procesarea rezultatelor pentru cele 4 subteste au fost evidențiate următoarele aspecte: media scorului (standardizat) pentru subtestul Copierea Desenului a fost 16 (+/-2.211); media scorului pentru subtestul Săgeți a fost (+/-3.091); media scorului standardizat pentru subtestul Construcția din Cuburi a fost 16.30 (+/-2.312); media scorului pentru Găsirea Drumului a fost 9.80 (+/-422.). Rezultatele obținute de subiecții studiului au fost peste nivelul așteptat. Scopul acestei evaluări este de a proiecta un patent care să constituie baza de selecție a copiilor pentru practicarea acestui sport. În TKD, capacitatea de a vizualiza și de a re-actualiza poziția adversarului față de persoane cuiva este strâns legată de performanțele sportive. Acest aspect sugerează că o performanță sportivă bună poate reflecta integrarea abilităților visuospațiale la copii.

**Keywords:** visuospatial processing; neuropsychological development; Taekwondo; middle childhood

**Abstract.** Visuospatial processing represents the individual's ability to visualise. The purpose of this paper is to provide relevant information about the influences of Taekwondo (TKD) practice on the level of visuospatial processing during middle childhood. The study was conducted on a number of 15 children, with an average age of 8.4 years(+/-1.9). To assess their visuospatial development level, it was used the NEPSY battery: A Developmental Neuropsychological Assessment for the Romanian population. From the test battery of the visuospatial processing field, the following subtests were used: Design Copying, Arrows, Block Construction, Route Finding. After processing the research results for the 4 subfields, the following aspects were highlighted: the average scaled (standardized) score for the Design copying subtest was 16 (+/-2.211); the average scaled score for the Arrows subtest was 13(+/-3.091); the average scaled score for the Block construction subtest was 16.30 (+/-2.312); the average scaled score for the Route finding subtest was 9.80 (+/-422.). The results achieved by the study subjects were above the expected level. The aim of this assessment is to design a patent which provides the basis for the selection of children to practice this sport. In TKD, the ability to visualise and also to re-actualise the opponent's position towards one's person is closely related to sport performances. This aspect suggests that a good sport performance may reflect the integration of children's visuospatial abilities.

**Keywords:** visuospatial processing; neuropsychological development; Taekwondo; middle childhood

### Introduction

Visuospatial processing is complex and involves many distinct but interrelated subcomponents: ability to synthesise elements in to a meaningful whole (visualization) and to mentally represent objects; ability to discriminate between objects, to establish the orientation of lines and angles, to distinguish between the left and the right side; ability to understand the connections between objects in space (location and directionality); ability to copy a model or reproduce it using cubes; ability to adopt a variety of perspectives and to mentally rotate objects; ability to understand and interpret symbolic representations of the external environment (maps and routes); ability to solve nonverbal problems (Cronin-Golomb and Braun, 1997, *apud* Korkman, Kirk and Kemp, 2007:17).

One of the largest bodies of data on the early development of visuospatial processing comes from a simple, spatial hiding task, originally introduced by Piaget (1952, *apud* Stiles, Akshoomoff and Haist, 2013). Most theories of visual object processing suggest that objects are recognised by feature analysis, which seems to be adequate for distinguishing heterogeneous class (Annaz, 2006:19). Jean Piaget was the dominant voice in the child psychology for much of the last century. His activity went through two main phases. Initially, he investigated how children develop the understanding of some concepts-such as time, space, speed, class, relation and causality-, which are the basic categories of knowledge and are fundamental for understanding reality. In the second phase of his work, he passed to a more global vision on intellectual development, instead of examining separate aspects of understanding in children; he joined them into a unifying scheme that refers to the entire process of cognitive development, from birth to adulthood, and, instead of proposing development stages for individual concepts, Piaget proposed a sequential scheme on four stages, to explain the intellectual growth as a whole (Schaffer, 2010).

The period comprised between 6 and 11 years is called, in the specialty literature, the *concrete operational stage*. In this period, children acquire a number of mental operations, such as multiple classification, reversibility, serial ordering and conservation, through which they can mentally manipulate the symbols in different ways. It is then that logical thinking appears, but problem solving is still related rather to concrete events than to abstract concepts.

Taekwondo is a Korean martial art similar to karate, but it focuses on the kicking techniques. One of the main benefits of the Taekwondo practice consists in the improvement of balance capacity. At the same time, if practiced by the children, it has beneficial effects on their physical and mental capacity making them stronger, an aspect that helps them in everyday life. Taekwondo is not only a physical training, but also a mental training; children learn to perform complicated movements, which have considerable effects on the concentration and memorization capacity, as well as on the motor coordination capacity. Another benefit for the children who practice Taekwondo is that, in their instruction, a special emphasis is placed on respect; children learn to respect their instructors, the gym (dojo), the equipment, etc.; their self-confidence and self-esteem increase, an aspect which makes them sure of themselves.

The main *purpose* of this study was to investigate the visuospatial processing capacity in children who practice Taekwondo during middle childhood, in order to construct a psychological profile necessary to the selection for the practice of this sport.

### Materials and methods

*Participants.* The study was conducted on a number of 15 children aged 6 to 11 years, who practice Taekwondo. Training sessions took place with a frequency of 2 times per week, each session lasting 60 minutes.

Visuospatial ability was assessed using the NEPSY battery, an instrument that measures the child's cognitive competences, essential for achieving higher performances in the school and extra-school domains.

From the visuospatial processing field, the following subtests were applied:

*Design copying.* This subtest assesses visuomotor integration. Children had to copy on a sheet of paper the given figures. Maximum scaled score is 19.

*Arrows.* This subtest assesses children's ability to establish the orientation of a line. The child looks at a series of arrows arranged around a target and must indicate those two arrows that go to the centre of the target. Maximum scaled score is 19.

*Route finding.* This subtest assesses the knowledge of visuospatial relations and directionality, as well as the ability to use this knowledge for transferring a route from a simple and schematic map to a more complex one. The child is shown a schematic map with a target house and is asked to find that house on a more complex map.

*Block construction.* This subtest assesses the child's ability to reproduce three-dimensional constructions after a model or an image (Korkman, Kirk and Kemp, 2007:9).

*Procedure.* Tests were administered by a licenced psychologist, who had attended a NEPSY training course: A Developmental Neuropsychological Assessment for the Romanian population. Assessment was conducted in the period from September to October 2014, in the Psychology Laboratory within the National University of Physical Education and Sports, Bucharest. This study is a preliminary research and the results are not conclusive.

### Results

For the statistical processing of the research results, it was used the IBM SPSS Statistics 19 software for psychology.

Table 1. *Descriptive statistics for visuospatial processing subtests*

		Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Design copying	6	17.00	.	.	.	.	17	17
	7	16.00	3.559	1.780	10.34	21.66	11	19

	8	17.00	.	.	.	.	17	17
	9	17.00	.	.	.	.	17	17
	11	15.33	.577	.333	13.90	16.77	15	16
	Total	16.10	2.183	.690	14.54	17.66	11	19
Arrows	6	18.00	.	.	.	.	18	18
	7	13.00	2.944	1.472	8.32	17.68	10	17
	8	10.00	.	.	.	.	10	10
	9	10.00	.	.	.	.	10	10
	11	13.33	2.887	1.667	6.16	20.50	10	15
	Total	13.00	3.091	.978	10.79	15.21	10	18
Route finding	6	10.00	.	.	.	.	10	10
	7	9.50	.577	.289	8.58	10.42	9	10
	8	10.00	.	.	.	.	10	10
	9	10.00	.	.	.	.	10	10
	11	10.00	.000	.000	10.00	10.00	10	10
	Total	9.80	.422	.133	9.50	10.10	9	10
Block construction	6	18.00	.	.	.	.	18	18
	7	17.25	2.872	1.436	12.68	21.82	13	19
	8	14.00	.	.	.	.	14	14
	9	18.00	.	.	.	.	18	18
	11	14.67	.577	.333	13.23	16.10	14	15
	Total	16.30	2.312	.731	14.65	17.95	13	19

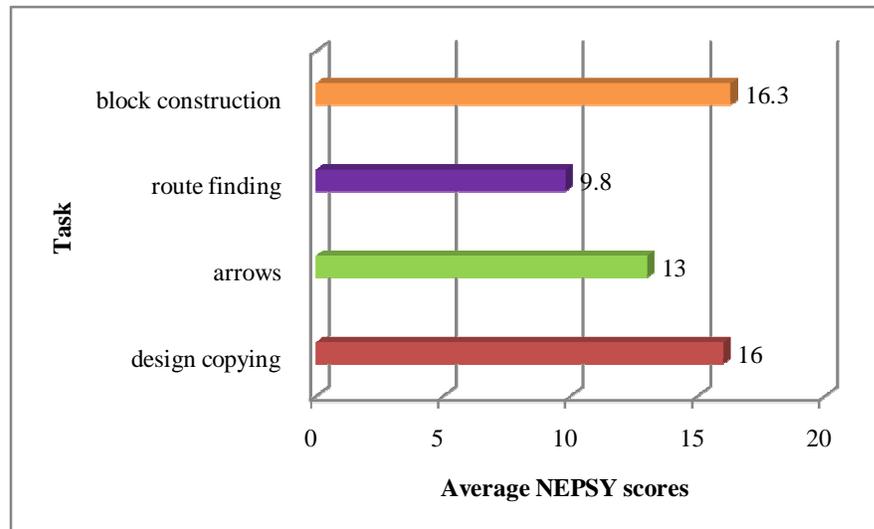


Fig.1. Performances in the NEPSY tasks

Note: Scaled scores: 1-4 = well below the expected level; 5-6 = below the expected level; 7 = limit; 8-12 = at the expected level; 13-19 = above the expected level

## Discussions and conclusions

According to Stiles, Akshoomoff and Haist (2013), the ultimate product of typical visuospatial processing is a rich and fine-grained understanding of the visual world around us that provides the basis for efficient behavioural and cognitive interactions with the environment. This ability arises from the intricate coordinated activity of multiple brain regions organized into two generally construed neuro-functional brain systems, architecturally defined as the ventral and dorsal visual processing streams, and functionally distinguished for pattern and object processing (i.e., ‘what’) and spatial or action processing (‘where’ or ‘how’), respectively.

Regarding the performances achieved by the children participating in this study, they have values above the expected level. Table 1 and figure 1 highlight the descriptive statistics of results at the subtests from the visuospatial processing field. Two subtests, *Design copying* and *Arrows*, assess the neuromotor components of visuospatial ability (Visu-Petra, 2008:91); the good performances at the *Design copying* subtest indicate a good capacity of visuospatial integration of forms for all children included in the study. The average performance, above the expected level at the *Arrows* subtest (13.00), reveals a good capacity of line orientation in space, which reflects a good spatial orientation capacity in the technical actions of Taekwondo.

Performances *at the expected level*, for the *Route finding* subtest, emphasize the significant influences of the Taekwondo practice on the capacity of visuospatial relations and directionality. This aspect is closely related to the characteristics imposed by the practice of forms (Poomsae). Poomsae represents a series of parries and attacks rationally combined and always performed in the same succession and direction. During a Poomsae, the practitioner uses the defence and attack techniques against an imaginary opponent who attacks from multiple directions.

At the same time, the higher performances achieved by the children at the *Block construction* subtest highlight a good ability to reproduce three-dimensional constructions after a model or an image. This ability is often demanded in Taekwondo, for reproducing the technical-tactical actions. Mention that results of this study still need to be confirmed by more large studies.

The high development level of visuospatial functions indicates a high capacity to integrate and coordinate spatial information. These abilities of the child are correlated significantly to the spatial-temporal characteristics required by the execution of Taekwondo techniques. We mention that Taekwondo is a dynamic sport, in which all technical elements are accurately executed, in both time and space (Păunescu and Păunescu, 2015).

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## CURRENT TRENDS IN PREPARATION OF CHOREOGRAPHIES – IMPACTS ON THE ARTISTIC TRAINING IN HIGH-PERFORMANCE AEROBIC GYMNASTICS

### (II)

Tendențe actuale în elaborarea coreografiilor – implicații în pregătirea artistică de performanță (II)

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**Rezumat.** Acest studiu este elaborat sub egida UNEFS București, ca partener în programul cofinanțat de Fondul Social European, prin Programul Operațional Sectorial pentru Dezvoltarea Resurselor Umane Programme 2007-2013, dezvoltat prin proiectul Pluri – și interdisciplinariate în programe doctorale și postdoctorale Cod proiect: POSDRU/159/1.5/S/141086, al cărui principal beneficiar este Institutul de Cercetare a Calității Vieții, Academia Română. Lucrarea tratează problematica pregătirii artistice din perspectiva cerințelor de elaborarea a coregrafiei exercițiilor, în gimnastica aerobică de performanță. Pornind de la prevederile codului de punctaj F.I.G. studiul de față își propune să analizeze literatură de specialitate a ultimilor aniși să desprindă tendințele actuale în elaborarea coreografiilor, cu implicații corespunzătoare în pregătirea artistică a gimnaștilor de nivel internațional. Chiar dacă componentele antrenamentului se potențează reciproc, interrelațiile acestora fiind de mult argumentatea, pregătirea artistică dobândește din ce în ce mai mult o identitate distinctă, o concepție structurată proprie, mijloace complexe de provenință diferită, care creează frecvent diferența între medaliați.

*Cuvinte cheie:* pregătirea artistică, coregrafie, gimnastica aerobică

**Abstract.** This study is achieved and published under the aegis of the National University of Physical Education and Sports of Bucharest, as a partner in the program co-financed by the European Social Fund through the Sectoral Operational Programme for Human Resources Development 2007-2013, developed through the project Multi- and interdisciplinary in doctoral and post-doctoral programmes, Project Code: POSDRU/159/1.5/S/141086, its main beneficiary being the Research Institute for Quality of Life, Romanian Academy. The work addresses the artistic training topics in terms of requirements for the preparation of choreographic exercises in the high-performance aerobic gymnastics. Relying on the provisions of the FIG scoring code, this study aims to analyze the relevant literature of the last years and to identify the current trends in the preparation of choreographies with the corresponding effects on the artistic training of the internationally recognized gymnasts. Even if the training elements intensifies each-other, their interrelations being reasoned since long time, the artistic training obtains more and more a distinct identity, an own structured concept, different complex origin sources, which frequently make a difference between medalists.

*Key words:* artistic training, choreography, aerobic gymnastics

### Introduction

*Choreographic composition –general and special aspects of the aerobic gymnastics.* Paraphrasing G. Căciuleanu (2008), brilliant dancer and choreographer, artist of great spiritual mobility, the matter, or more precisely, the choreographic movement matter, is structured as an edifice. Choreography is created as a structure where the artistic side cohabits with the biomechanical-functional side; the foundation stability coexists with the beauty of the external shape, no matter how surprisingly it is. A precise and unique moment in the “life” of a body movement is made of a set of instantaneous body statuses structured as a body phrase. Several body phrases developed in time represent a choreographic phrase. On its turn, choreography is made of choreographic phrases subordinated to a clearly defined concept. Apart from this global vision, with obvious poetical accents, we aim to submit hereinafter the core aspects giving a distinct structure to the choreographic composition.

To this end, we will try to rank the data related to the choreographic movement components as they are analyzed in the literature of the last years, which we accustomed to the special requirements of the aerobic gymnastics.

As assumption of this initiative, we emphasize that the danced movement is a form of visual and kinesthetic art, which exceeds the sensorial field, engaging in an intense and personal type of communication, difficult to be explained in a scholastic manner. Generally, the intention of a movement may come from the body inner but also from its exterior. It is of interest for the creation process that movement arises from an area rather spiritual, due to an internal inspirational force, characteristic to great creators.

### Content (Addressed issue)

*Spatial aspects.* The space represents the most comprehensible element explored by the body movement. Under choreographic vision and not only under such vision, the three spatial dimensions, as well as the possibility

to convert space into temporal dynamics, arise several aspects to be analyzed, the athlete creating, at the same time, the matter and shapes which make the space visible.

A number of authors (Levieux, 1997; Wertz, 1985; Green, 2010; Minton, 2007; Sofras, 2006; Vişan, 2005; 1991, Koutedakis and Jamurtas, 2004; Fenton, 2011; Pomer, 2009, Kraus and Chapman, 1981) rank the space topics, identifying the following functional aspects in the creation of choreographies, as they are subordinated to the *space, lines and forms, symmetry and asymmetry, direction and negative space*:

*The space* includes:

- General space, that means the area available for the athlete in order to present his/her exercise and where he/she performs various movements. In the individual trial run, the general space is large enough and may seem to be static by comparison to the space in the couple, trio and group events, where the dynamism and energy impression is much more significant. Related to the later aspect, creating the sensation of energy to be communicated to the referees and public is much more difficult, requiring a significant effort from the athlete, compared to other events;

- Personal space, that means the area delimited by the body center and extremities of the moving subject; in other words, the athlete “takes” with him/her the kinesphere, as Rudolf von Laban, quoted by Kraus and Chapman (1981), referred to the personal space, within which he/she performs. The manner in which the personal space is extended or reduced depends on the choreographic concept that emphasizes a certain idea or emotional feeling;

- Self-space, a notion that differs from the personal space because it is related to the area occupied by the athlete body during the execution of some elements, which do not require his/her movement in space (by instance, movements around some rotation axes or movements involving the static muscular contraction or relaxation);

- Relations between the athletes, which mostly emphasize the choreographic idea to be outlined through any means: music, costumes, light effects etc. The movements conceived to emphasize the collaboration between gymnasts may or may not include the physical contact between them. As the relations between them develop during the exercise, an additional space is created through the lines and shapes interconnecting them. Therefore, the relations are built simultaneously with other aspects pertaining to the space as aforementioned;

- Split focus, which is in a close relation with the aforementioned elements and may represent a “trick” sometimes used by the choreographers, considering the impossibility of the spectator to watch the simultaneous representation of performers in different areas of the contest space. This may be effective, when the coach/choreographer wants to “hide” some imperfections in performing synchronously some exercises, as well as some differences in the technical skills of the athletes. However, if during the exercise, referees must observe a given key element relevant for the level of difficulty of the exercise, choreography must remove such split focus and prepare its occurrence by the increase of dynamics towards the focal point, using the energy or the musical support.

### *Lines and Shapes*

Line and Shape are basic choreographic concepts for the design of any exercise, being instrumental elements for the creation of the emotional content of the exercise. Our ability to read the body language causes the option of affective involvement by means of the body shape. Creation of a choreographic design can be a simple or a complicated process, as well; the oversimplification of the composition can create the predictability and boredom feeling, while the complicated and chaotic lines may create the feeling of disorganization and nervous tiredness.

The design process must carefully analyze the lines/shapes combination in order to determine its value as choreographic material, by their juxtaposition when structuring the combinations of movements. By instance, the simultaneous performance is a method to obtain complementary lines (as in case of the creations of Marius Petipa), simplicity, stability and compositional balance, but requires, by the other hand, a long-lasting technical training and homogeneity in terms of anthropometrical features and skill levels of the athletes.

In such circumstances, several simple rules can be identified in the use of lines and shapes:

- Closed curves oriented towards the body center have the meaning of introversion, protection, shyness, negative emotional feeling;
- Opened curves oriented towards the exterior of the personal space have the meaning of extroversion, positive feeling of satisfaction and opening to the others, energy, force, trust, etc.;
- Straight long lines reflect usually the extroversion, the feelings of force and determination, the bold action;
- Acute angles may suggest potential energy ready to boost;

- Combination of lines may suggest an internal, personal conflict or a conflict within the group, while the conversions between curve and straight lines may reflect contrary emotions, simultaneous different intentions. Usually, when the choreographer designs a shape relying on a certain intention, this intention will spontaneously be concretized, without a special focus of the choreographer on the lines.

A choreographic composition is usually successful when it combines the simplicity criterion with the variety and contrast criterion, regardless of the abstract or express emotional nature of the composition.

#### *Symmetry and Asymmetry*

Due to the particularities of the gymnastics, in general, the movements are many times performed repeatedly, the symmetry and asymmetry elements creating dynamic, contrasting shapes, compliant with the choreographic concept.

To reflect diversity, the choreography will put together the symmetric forms, as the mirror-reflected images for each part of the body axe, with the asymmetric shapes, different for each part of the body axe. The reflection line divides the contest space in horizontal plan (creating the front-podium area and the back-podium area), as well as in vertical plan (creating the podium-left area and podium-right area). The symmetric shapes mutually balance and will create the feeling of visual symmetry. When subjects mobilize only one part of their bodies, the feeling will be of visual asymmetry.

It is important to note that the symmetric shapes create the feeling of balance, stability and comfort but their use must not be overestimated because they can induce a feeling of monotony and anticipation. The balance within the contest space is created also through the asymmetric shapes related to number and size of gymnasts, their distribution on the contest space. As such, in the mixed or trio event, the female gymnasts performing a partnership element in the left-back podium area balance the performance of the male gymnast on the right-front podium area.

#### *Direction*

The concept of direction in the aerobic gymnastics refers both to the movement of the athlete on the contest space, and to the movement of the body segments under technical elements, both types of movements outlining distinct spatial routes. Curved or straight trajectories can create effects similar with those generated by the lines and shapes aforementioned. As such, a straight line-type trajectory suggests force while a curved-type trajectory reflects the feeling of calm and grace. A trajectory containing direction changes can indicate impatience, indecision or surprise, while a circular trajectory suggests continuity and unity. Humphrey(1987) considers the two corners of the front-podium area as being optimal for the beginning of the exercise. Moreover, the author supports that the trajectory from the left-front-podium area corner to the right-back-podium area corner is the most powerful diagonal because such vision enables spectators to read the choreographic design as it is read the written language.

Use of the direction in the choreographic composition implies also the focus/capture of the attention. This refers not only to what can be visually suggested but also to what can be transmitted by using different body segments. Usually this is obtained when a combination of lines created by the subject leads to the focus of the spectator's attention on a given corporal area. To this end, some professionals (Dell, 1977) identify a direct focus of attention to a singular body area (by the mobilization of a body segment towards the area of interest) and indirect focus on several focal points of the performer (by using curved, sinusoidal trajectories on soil, as well as by creating corporal shapes within the three-dimensional space).

The direction in the choreographic creation gives to a movement the capacity to focus the spectator's attention in connection to the subject features and the interest point, regardless of the sense: forward, backward, lateral, upward or downward. Therefore, movements forward, towards a given focal point, can reflect force, determination and greatness; the lateral movements can symbolize exploration, indecision, while the backward movements or movement trajectories can indicate defensive attitude of retreat and ignoring of the focal point. The upward movements indicate the idea of growth, evolution, development, while the downward movements mean weakness, lack of energy and tonus. In the couple, trio and group events, the relations between gymnasts "designed" by the choreography can be subtly changed by simply changing the work directions. Figures 2 and 3 show the contest space for aerobic gymnastics, respectively an illustration for the dynamic of the directions/movements associated to an exercise for individual event.

### Contest space

Orientation of points to the main direction are presented in Fig 1.

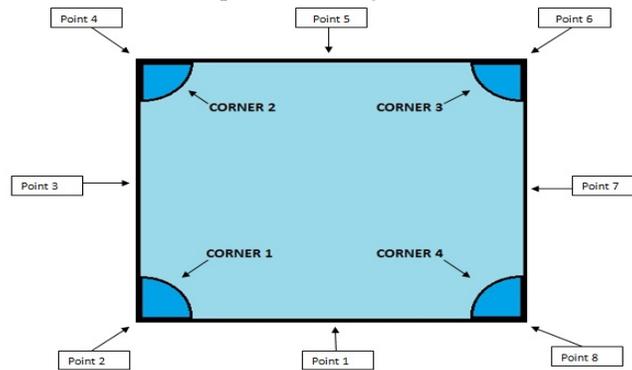


Fig. 1. Coordinates of the official space for the aerobic gymnastics contests

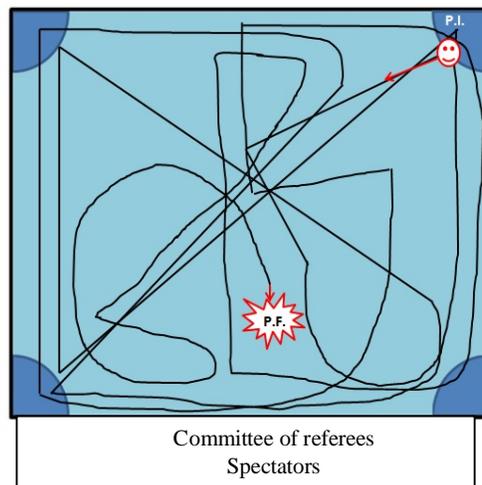


Fig. 2. Dynamics of the movement directions for an exercise designated for an individual event

### Positive, Negative and Symbolic Spaces

The positive, negative and symbolic spaces represent concepts that are read in the recent works in this field, being associated especially to visual arts, but allowing also the extending to expression sports, too.

The positive space is represented by the space occupied by a structure or form, namely the area occupied by the athlete body at a given moment. For Group events, the positive space is a significant element, enabling multiple work forms, directions and work levels. However, sometimes, an overpopulated positive space can distract the focus of the spectator, who loses subtle body shapes or the interpretation of the subjects.

The negative space is the free area which is not occupied by any structural or corporal element of the athlete. The free area surrounding the positive space is that which gives substance to the choreographic creation. For the simple choreographic structures, the negative space is almost automatically created, while in case of complex creations, with many participants, focus is distributed mostly on the bodies in movement and less on the free areas between them. In the gymnastics or artistic skating branches, the spectator's or referees' artistic perception is created both by the positive space and by the negative space, as "curved" by the athlete movements.

In fact, there is an ongoing transition between the positive space and the negative space, through their mutual conversion, rendered possible by the technical skills and motor abilities of the athlete.

The symbolic space is represented by the negative space to which is granted a given significance within the choreography. The best example to understand the symbolic space is the mime's creation in theatric art, who can reflect, by using his/her body, different objects, phenomena, feelings which are not effectively present within the physical space.

## Conclusions

We start our investigation, aiming the artistic component of the aerobic gymnastics of high performance, from the assumption according to which designing a high level choreographic composition implies to understand in depth the topics of the sport science and to know the aspects concerning the dance peculiarities, as well, as an educational experience with multiple valences.

Even if at the first sight, the choreographic composition process seems to be a spontaneous act, in fact it implies a strict discipline, being subjected to some principles pertaining rather to precise sciences than to improvisation, as, by instance, spatial characteristics, lines and shapes, symmetry and asymmetry and direction. In this manner, the choreographic vision is reflected in the three-dimensional space to which it grants dynamism and expressivity.

We can consider that aerobic gymnastics is mainly visual and dynamic, this enabling the choreographers to mold and design different aspects of space, divided in characteristics of direction, size, level and focus.

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## GOVERNANCE IN SPORT - A NECESSITY IN THE MANAGEMENT OF THE SPORTS ORGANIZATIONS

Guvernanța în sport – o necesitate în managementul organizațiilor sportive

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**Rezumat:** Derularea activității în conformitate cu principiile bunei guvernante, a devenit o necesitate pentru organizațiile sportive, în vederea atragerii de sponsori și parteneri, pentru dovedirea eligibilității în vederea obținerii de fonduri prin diferite programe guvernamentale, ale Uniunii Europene sau altele, precum și pentru obținerea (sau după caz menținerea) calității de membru într-o organizație de tip asociativ de nivel național sau internațional. În acest articol vom prezenta conceptul de guvernanta al organizațiilor sportive, principii și recomandări cu privire la buna guvernanta în sport precum și impactul acestora asupra activității organizațiilor. Implementarea principiilor bunei guvernante în conducerea organizațiilor sportive va asigura fundamentul necesar pentru îndeplinirea obiectivelor principale ale acestora, respectiv promovarea sportului lor în general, creșterea participării la toate nivelurile și formarea sportivilor de înaltă performanță.

*Cuvinte cheie:* guvernanta, principiile guvernantei, management

**Abstract:** Operating in accordance with the principles of good governance has become a necessity for sports organizations in order to attract sponsors and partners, to prove eligibility to obtain funds through various government programs, those of the European Union and others, and to obtain (or to maintain) membership in an associative organization at national or international level. In this article, we present the concept of governance of sport organizations, principles and recommendations on good governance in sport and their impact on the activity of the organizations. Implementing the principles of good governance in the management of sports organizations will provide the necessary foundation for achieving their main objectives, namely to promote sport in general, to increase participation at all levels and to develop high performance athletes.

*Key words:* governance, principles of governance, management

### Introduction

Leaders of European countries have recognized the particularities of difficulties and challenges that sports organizations must manage. In 2000, in the conclusions of Nice meeting, the European Council, stressed "its support for the independence of sports organizations and their right to organize themselves through appropriate associative structures" (Presidency Conclusions of the Nice Council of Europe Meeting, 2000). This support was conditioned by sports organizations applying the principles of democracy, transparency, solidarity and implementing a code of ethics.

By this statement, the European Council supports the idea that sport has specific and distinct characteristics from other areas, recognizes its social function in Europe and confirms that it will take account of these specificities in the implementation of Community policies. However, sports organizations are held responsible to demonstrate the entitlement to maintain these facilities. Otherwise, legislators at both national and international level will intensify the pressure in application of legal restrictions and the courts will apply the law dealing with sports organizations like for any other organizations of commercial type.

In several countries, governments have encouraged or imposed national sports organizations to modernize the organization and operation mode. This determined an increase in the share of salaried staff and a reduction of the voluntary staff.

To obtain sponsorships and often even for accessing public funds necessary for the development of sport, national sports organizations are forced to adopt procedures and methods adapted from the work of the business corporate system and performance indicators. This trend was reinforced by governments imposing objective setting and establishing performance indicators. There were developed audit and control systems that are supported by sanctions imposed on those organizations that fail to meet centrally imposed targets (Green and Houlihan, 2006).

### The current level reflected in literature

The Organization for Economic Co-operation and Development (OECD) has defined corporate governance as "the system by which organizations are directed and controlled. Corporate governance structure specifies the distribution of rights and responsibilities between the different parts of the organization, such as the governing board, managers, shareholders and other stakeholders, and sets out the rules and procedures for making decisions;

in this way, it provides the structure through which the objectives and the means of attaining those objectives and monitoring performance are set" (www.oecd.org).

The Good governance Expert Group organized at EU level defined the corporate governance as "the framework and culture within which a sports body sets policy, delivers its strategic objectives, engages with stakeholders, monitors performance, evaluates and manages risk and reports to its constituents on its activities and progress including the delivery of effective, sustainable and proportionate sports policy and regulation" (EU Expert Group "Good Governance", 2013, *Principles of good governance in sport*).

The mechanism of governance (formal documentation, organizational structure etc.) specifies the allocation of rights, authority and responsibility among staff, in order to monitor performance and to achieve the goals. Thus, the "governance refers to the way in which the governing bodies are coordinated and controlled" (Sawyer, Bodey and Judge, 2008). On a larger scale, governance describes the methods used by a governing body to ensure that its members operate in accordance with their established rules, procedures and protocols. Through good governance a system to monitor and record all activities within the jurisdiction governing body, a system of taking the necessary measures to ensure compliance with policies and procedures is implemented and has corrective action when the rules were misinterpreted or ignored.

Friedman and Philips (2004) consider that there is no perfect organizational structure to ensure good governance. They affirm that the organizational structure equally helps and obstructs the work of governance. "The challenge is to design a governance structure capable of a proactive approach to determine the mission, strategy and policy and be responsive to the external and the internal environment as well as the needs and aspirations of the members".

In 2006, United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) identified eight characteristics of good governance: "participatory, responsive, equitable and inclusive and consensus oriented. It is also transparent, accountable, effective and efficient, and follows the rule of law".

### **The issue addressed**

The Organization for Economic Co-operation and Development (OECD) identified in 1999 six general principles of corporate governance, which were subsequently updated and revised in 2004. The key ideas emerging from these principles are: consistency with the rule of law, the division of responsibilities among different supervisory, regulatory and enforcement authorities; the protection of the shareholders' rights; the equitable treatment of shareholders; the recognition of the rights of stakeholders established by law or through mutual agreements; disclosure and transparency; the responsibilities of the board in the strategic guidance of the company, the effective monitoring of management by the board, and the board's accountability to the company and the shareholders (OECD Principles of Corporate Governance, 2004).

By understanding their rights and responsibilities resulting from the Nice Declaration of the European Council, since 2001, sports organizations, under the guidance of the European Olympic Committees (EOC) in the first European conference on governance in sport ("*The Rules of the Game*", Europe's first conference on the Governance of Sport, Brussels, 26 & 27 February 2001) have made the following nine recommendations on good governance of sports structures:

1. The role of governing structures: the main role of governing structures in sport is to establish norms and rules, to develop and to promote the sport, and to extend its popularity and to represent that respective sport and all those involved in it.
2. Structure and responsibility: good governance requires a separation of roles (elaboration and amendment of rules; executive decision making regarding the management of financial resources and the organization of sporting events; solving disputes between members, participants in sports and other relevant third parties).
3. Members of the Governing Structures and dimensions: governing structures should publish information about the structure of human resources by numbers and names, information on the mandate of the organization members, voting procedures, selection and recruitment as well as delegation of competences.
4. Democracy, elections and appointments: the rules for the granting of membership and the withdrawal of this quality should be clear. Election of the governing structures must be done by democratic vote.
5. Transparency and communication: the way in which the governing structure communicates with members of the organization is a quality indicator of the governance. Essential elements of communication are: statements of the management regarding the process of governance; decisions on leading policies, on the elections and other issues such as executive, legislative, judicial or commercial; providing feedback channels from members.

6. Decisions and appeals: governing structures will provide sufficient arguments to justify its actions and decisions. It also will implement procedures for resolving differences. These procedures will necessarily offer the possibility of appeal, either on domestic routes or on external routes or the possibility of access to arbitration (ad hoc or recognized structures such as the Court of Arbitration for Sport).

7. Conflict of interests: the principle refers to the clear separation between the function of governing of the governing structure and any commercial activity that may the sport organization be involved in.

8. Solidarity: fair sharing of incomes from the exploitation of rights attached to sports events encourages talent development and organization of competitions; administration of redistribution mechanisms must be transparent, accountable and objective.

9. Recognition of other interests: in addition to the responsibility towards its members, the sport organization should identify other interest groups that would be affected by its decisions and actions. The interests of these groups should be taken into consideration whenever possible.

Experts from the International Olympic Committee (IOC) formulated seven universal principles for good governance in the Olympic and Sports Movement. These include the above mentioned concepts and several new items referring to: vision, mission and strategy; structures, rules and democratic processes; high level of competence, integrity and ethical standards; settlement, transparency and control; solidarity and development; athletes' involvement, participation in the organization and care / attention to them, harmonious relationship with governments while preserving autonomy (International Olympic Committee, 2008). IOC emphasizes that cooperation and consultation with governments are essential for sports organizations, being considered the best ways to preserve autonomy.

In accordance with the principles of corporate governance, any decision about the organization or its structure must be based on certain principles, regardless of the extent of a sport or the number of human resources within the administration. In addition, although the principles of good governance in sport were analyzed and presented in different formulations of several organizations and fora, the following common features, generally accepted, can be observed:

- Clear demarcation of the roles of government – the structure of governance must be very precisely documented with clear delineation of rights and responsibilities of each body involved. Also, there should be no overlap between the rights and responsibilities of the two bodies or persons.
- Effective governance processes are the result of approved and implemented written policies. These processes should reflect best practice and be reviewed periodically. Also, for each committee there should be established the purpose, the authority that has been delegated to it and its reporting requirements.
- Effective control of governance – the board must define very precisely the role and determine the processes that will determine the strategy, strategic objectives, methods and means to measure performance, processes of defining the core values, mission statement and the operating code of ethics..
- Improving governance refers to the fact that each board must ensure the implementation of a process to regularly assess their own performance and the implementation of a program of development and improvement of board members and staff who provide administrative management of sport organizations.

The Managing Board must provide leadership for the sports organization and complete its duties with integrity and rational judgments based on good and sufficient justification, always acting in the interest of members, demonstrating their transparency, accountability and the possibility of reporting.

## **Conclusions**

Applying the principles of corporate governance, sports organizations will have the following benefits: a useful verification tool, to ensure that they act responsibly towards its own members and to third parties with a legitimate interest in their activities; solid arguments for building a defense in case of a dispute, being able to demonstrate that all actions and decisions are duly motivated and all work is subject to specific checks illustrated in balances; demonstrating the ability of self-regulation is an argument that can convince legislators that their interventions in running of sports are no longer needed.

Implementing the principles of governance has become a mandatory measure without which the activity of a sport organization may suffer, due to the impossibility of adopting decisions, not recognizing and challenging governing structures and committees by partners (state authorities at central and / or local level, National Olympic forum, Specialized International Federation etc.) and thus the decisions taken. This can block the activity of the organization indefinitely, which may even lead to the disappearance of the organization.

To operate in accordance with the principles of good governance has become a necessity for sports organizations, in order to attract sponsors and partners, to prove eligibility to obtain funds through various government programs, those of the European Union or others, and to obtain (or after appropriate maintenance) membership in an associative organization of national or international level.

Finally, corporate governance, will provide sports organizations the needed structure of an efficient organization of the development of high performance athletes, clearly defining all stages, the responsibilities of each functional segment involved and the opportunity to develop tools for measuring the effectiveness and the efficiency of the process as a whole and the different components separately.

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## STUDY ON THE FUNCTIONAL LEVEL IN CHILDREN WITH CEREBRAL PALSY

Studiu privind nivelul funcțional la copii cu paralizie cerebrală

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**Rezumat.** Studiile privind cunoșterea dezvoltării psiho-neuro-motorii a copilului normal au o deosebită importanță practică în diagnosticare mai ales când semnele clinice ale leziunilor cerebrale sunt de obicei slab exprimate. Există o serie de reflexe de redresare și reacții primare ce ne ajută la cunoșterea dezvoltării neuromotorii și la stabilirea vârstei biologice a copilului. Întârzierea în apariția reflexelor tonice primitive sau a reacțiilor primare sau dispariția lor dincolo de limita de vârstă, constituie semne esențiale de diagnostic precoce în sechelele leziuni cerebrale. În această lucrare ne-am propus să constatăm diferențele de dezvoltare motrică și funcțională de la un copil la altul și stabilirea gradelor de funcționalitate a copiilor cu paralizie cerebrală. În acest sens am stabilit ca și obiective efectuarea unei cercetări a parametrilor funcționali (după metodologii și scale clinice standardizate la nivel mondial, utile în stadializarea funcțională, în stabilirea metodologiei de recuperare) ai unui lot reprezentativ de copii diagnosticați cu PC.

*Cuvinte cheie:* funcțional, copii, paralizie cerebrală

**Abstract.** Studies focused on understanding psycho-neuro-motor development of a normal child are of particular importance in diagnosis especially when clinical signs of brain damage are often poorly expressed. There are a number of recovery reflexes and primary reactions that help us know neuromotor development and establish the biological age of the child. Delay in manifestation of tonic primitive reflexes or of primary reactions, or their disappearance later than the normal age, are essential signs of early diagnosis in brain injury sequelae. In this paper we intend to show differences in motional and functional development from one child to another and to determine the degrees of functionality of children with cerebral palsy. Thus, we have set as objectives conducting a research on functional parameters (based on methodologies and standardized global clinical scales, useful in functional staging and in setting recovery methodology) of a representative sample of children diagnosed with PC.

*Keywords:* functional, children, cerebral palsy

### Introduction

Rosenbau (2007: 32) stated that "cerebral palsy (CP) describes a group of permanent disorders of the development of motor skills and posture, determining or causing activity limitation, which are attributed to non-progressive damage occurring in fetal or infant brain development". The motor disorders of cerebral palsy are often accompanied by sensory disturbances, perceptual, cognitive, communication and behavior, epilepsy and secondary musculoskeletal impairments.

In children, the relationship between organic lesion severity of CNS and functional deficit may change over time. There are cases when "motor tone and motility abnormalities present in the first weeks or months of life may improve gradually during the first year of life", sometimes to extinction (Taudorf, 1986: 19). The essential purpose of the research was to study the functioning of children with cerebral palsy. For this research we aim to achieve the following objectives:

- organizing a study on the functioning of children with cerebral palsy;
- stating global motional functionality levels of children with cerebral palsy;
- establishing the degrees of functionality of each child.

To emphasize the necessity of the study, we have started from the assumptions according to which, if development of the motor and functional level differs from one child to another and, if children with cerebral palsy present a major functional deficit.

### Materials and methods

Research subjects, counting 31 children, diagnosed with cerebral palsy, aged between 1-12 years, belong to the General Directorate of Social Assistance and Child Protection, Bacău. The research was conducted over the period 2012-2013, during which we applied methods, instruments and assays, and then collected and understood recorded results.

*Method* based studies were used and it was found that evaluation tests have established the global motor and functional development in children with cerebral palsy.

*Measurement and assessment tools.* In order to determine the particularities of age, biometric potential development characteristic of each period, tests for assessing the overall development and motor function were used. To assess global motor and functional development we chose to use two evaluation tests which aim to highlight the degree to which the individual is limited to motor function.

The two tests were represented by:

- classification system expanded and revised gross motor function (GMFCS - Gross Motor Function Classification System Expanded and Revised GMFCS - E & R);
- global motor function assessment test (EMFG) (Robănescu, 1993:16).

The research was conducted over a 6-months period, from December 2013 to May 2014, as follows:

- December 1, 2013 - January 30, 2014 - deepening theoretical knowledge-driven basis;
- February 1, 2014 - 30 February, 2014 - identifying the characteristics of the subjects and achieving preliminary research group;
- Marty 1, 2014 - May 30, 2014 - identifying global functional level in children with cerebral palsy.

## Results and discussion

The results of the overall functional and motor development through global motor function assessment test were pooled and contained in Table 1.

Table 1. *The results from the global motor function assessment test (EMFG)*

Item no.	I	V	Lying %	Seated %	Quadruped %	Orthostatic %	Away %	Total
1.	A. L.	8	72,54	68,33	45,23	30,76	11,11	45,59
2.	A. A.	9	72,54	73,33	40,47	41,02	9,72	47,41
3.	A. G.	3	79,89	78,43	72,78	59,21	34,68	64,39
4.	A. M. A	9	6,66	6,5	35,71	33,33	11,11	42,36
5.	B.M.	3	82,35	73,33	64,28	35,89	5,55	52,28
6.	B.R.AI	2	15,68	0	0	0	0	3,13
7.	B.S.A.	3	70,58	68,33	54,76	38,46	8,33	48,09
8.	C.E.T.	6	27,45	13,33	16,66	12,82	0	14,05
9.	C.M	6	33,33	20	11,90	10,25	0	15,09
10.	C.D.	2	72,54	70	40,47	38,46	37,5	51,79
11.	C.P.	7	82,76	79,35	76,87	58,99	46,79	68,95
12.	C.I.	10	73,67	71,90	71,23	70,43	44,56	66,35
13.	C.A.	12	66,78	54,7	53,56	36,45	14,65	45,12
14.	C.L.	4	49,06	33,33	35,71	10,25	6,94	27,04
15.	C.P.	9	46,87	24,66	16,89	14,89	0	20,66
16.	D.M.	4	80,39	78,33	52,38	24,20	4,16	48,69
17.	F.D.N.	1	47,05	13,33	0	0	0	12,07
18.	G.G.	8	76,47	73,33	47,61	35,89	11,11	48,88
19.	I.G.	9	48,98	23,44	21,34	12,89	0	21,33
20.	I.K	2	50,94	51,66	9,52	0	0	22,42
21.	I.A.	6	9,80	5	0	0	0	2,96
22.	L.M.	8	67,22	63,89	42,34	30,57	12,66	43,33
23.	L.I.M.	8	25,79	5	0	0	0	6,15
24.	M.D.	4	79,67	78,99	56,98	50	38,43	60,81
25.	M.A	5	64,70	20	9,52	10,25	0	20,89
26.	M.A.A.	5	27,45	8,33	11,90	10,25	0	11,58

27	O.A.	6	81,96	81,66	69,04	51,41	38,88	62,34
28.	R.G.	8	76,66	88,97	76,54	69,66	42,31	70,82
29.	S.B.	4	86,27	86,66	78,57	64,10	50	73,12
30.	S.D.	2	77,47	83,33	73,80	61,53	50	69,22
31.	T.A.	10	72,89	72,45	70,23	68,24	62,79	69,32

Studying all items in the assessment test gave us the opportunity to evaluate subjects in global terms, where 100% is the normal development and deviations from this percentage is deficit. However this test shows the status of development of the subject by emphasizing fundamental stages a child must pass during his/her evolution. We notice the results below a percentage of 50% were rated "poor", while results over 50% were rated "good". Calculations show that:

- while lying: of the 31 children, 24 had good functionality lying which is a percentage of 77.41% and 7 do not react, representing a 22.59 percent;
- seated, of the 31 children 21 children reach their functionality and better, which is a 67.74 percent and 10 children do not reach the sitting position, which represents a 32.26 percent;
- quadruped: notice that 15 children have a good functionality, representing 50%; and 15 children fail to maintain a position which represents 50%;
- standing: we may observe that only 11 children have functionality, representing a 35.48% share; and 20 children fail to maintain position, which is a percentage of 64.52%;
- while walking: of the 31 children only one manages to walk with good stability, which is a rate of 3.22% and the remaining 30 children can move, but without having good stability, which is a percentage of 96.78. Analyzing the results of motor and functional global assessment (table 1) of the 31 subjects, we observed that 11 children have a good functionality, representing a percentage of 35.48; and 20 children, have a weak functionality, 64.51% ) (Fig. 1).

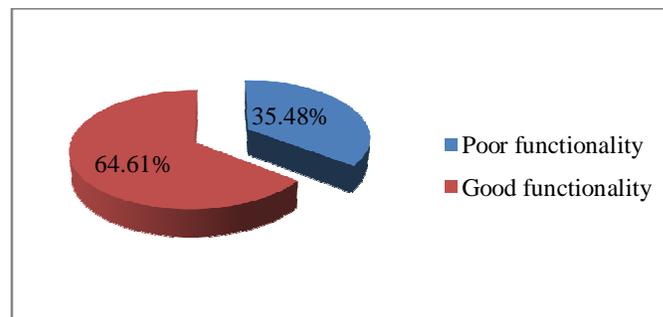


Fig. 1. Graphical representation of global functionality assessment

As shown in the table below 1 points recorded media research subjects at the five indicators of assessment is between 2.96% and 73.12%, so the assumption that the global development and functional driving is different from one child to another has been validated.

The results of basic motor function classification (Gross Motor Function Classification System, Rosenbaum, 2007), were pooled and contained in the Table 2.

Table 2. The results in motor function classification system base

Age	Level I		Level II		Level III		Level IV		Level V		
	No	%	No	%	No	%	No	%	No	%	
1 year	1	0	0.00%		0,00%		0.00%	1	20.00%		0.00%
2 years	4	0	0.00%	1	14.28%	2	13.33%		0.00%	1	33.33%
3 years	3	0	0.00%	2	28.56%	1	6.67%		0.00%		0.00%
4 years	4	0	0.00%	1	14.28%	2	13.33%	1	20.00%		0.00%

5 years	2	0	0.00%	0.00%	2	13.33%	0.00%	0.00%		
6 years	4	0	0.00%	0.00%	2	13.33%	1	20.00%	1	33.33%
7 years	1	0	0.00%	1	14.28%	0.00%	0.00%	0.00%		
8 years	5	0	0.00%	1	14.28%	3	20.00%	0.00%	1	33.34%
9 years	4	0	0.00%	0.00%	2	13.33%	2	40.00%	0.00%	
10 years	2	0	0.00%	1	14.28%	1	6.67%	0.00%	0.00%	
12 years	1	0	0.00%	0.00%	1	11.11%	0.00%	0.00%		
Total	31			7		16		5		3

According to the results shown in the table 2 of the 31 children with cerebral palsy, included in the study, they were grouped as follows: aged 1 year there is one which is 3%, aged 2 years there are 4 which are 13%, aged 3 years, there are 3 which are 10%, aged 4 years there are 4 which are 13%, aged 5 years there are 2 which are 7%, aged 6 years there are 4 which are 13%, aged 7 years there is one which is 3%, aged 8 years there are 5 which are 18%, aged 9 years there are 4 which are 13%, aged 10 years there are 2 which are 7%, aged 12 years there is one which is 3%, according to Fig. 2.

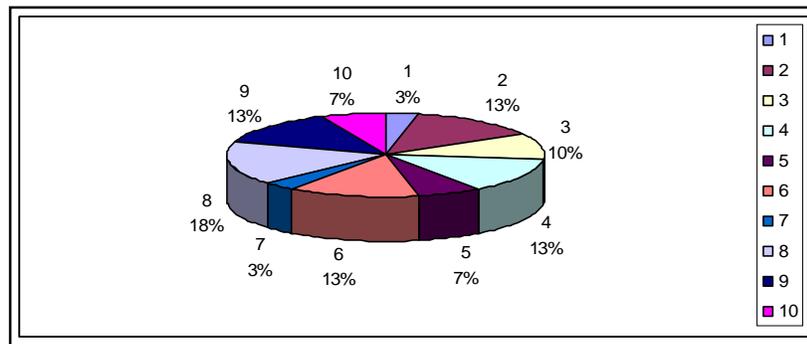


Fig. 2. Graphical representation of the age distribution of subjects

In group of motor skill Grade 2 were within seven subjects, one of which is going to support 1 year, representing 14.28%, 1 child is 2 years, moving with support or a device, representing 14.28% two children aged 3 years, moving with support or a device representing 28.56%, a child is 4 years Backed up and down with no salt, no runs, representing 14.28%, a child is 7 years, representing 14.28%, moving but difficulties in running and jumping, one is 8 years old, but welcomes moves to running and has difficulty, representing 14.28%, a child is 10 years, but have difficulties moving from running and jumping a child is 12 years but have difficulty moving running and jumping, representing 14.28%.

The group of Grade 3 motor ability were within 15 children of which 2 have 2 years of age, stand upright with support representing 13.33%, one is 3 years go short, do not turn one representing 6.67 %, 2 children age 4 (go short, do not return alone accounting for 13.33%, 2 are 5 years old, standing upright but with support, moving the backing 13.33%, 2 are 6 years stay upright but with support, moving the backing 13.33%, 3 to 8 years is moving support, accounting for 20%, 2 children 9 years old, travels representing 13.33% support, a child is 10 years old representing 11.11%, moving to support.

In group of motor skill Grade 4 were within 5 children, one has one year of age, but not control their heads sit, which is 20%, one is 4 years old, standing upright with support hands, moving or rolling quadrupeds, representing 40%, 2 to 9 years old can travel in a wheelchair but, representing 40% according to the schedule no. 3.

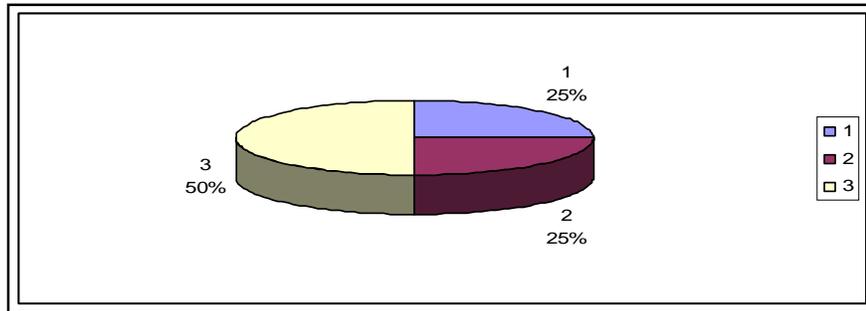


Fig. 3. The age distribution of subjects with grade 4

In grade 5 were within a child aged 2 years and can not control head is 33%, one is 7 years old, can control his head but did not sit, is 33%, one is aged 8 years can control his head but did not sit, representing 33.34%, according to the Fig. 4.

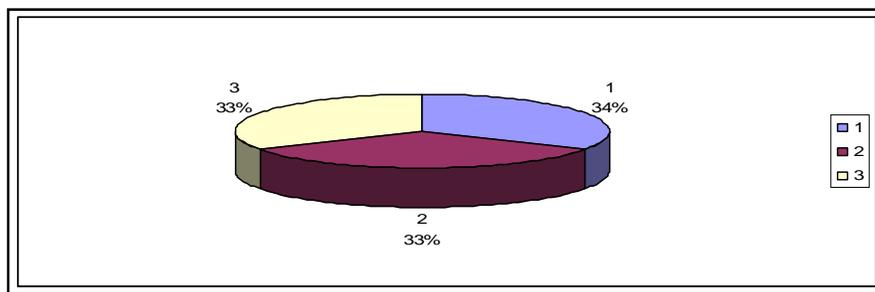


Fig. 4. The age distribution of subjects with grade 4

As shown in the table below 2 results show that:

- 22.58% of children with paralysis are in the second degree, is the group to an activity characterized by quality and low speed;
- 51.61% are in Group III, the group to an activity characterized by difficulty handling objects and need help;
- 16.12% are in Group IV, the group to an activity characterized by limited manipulation of simple objects adapted activities;
- 9.67% is the group V, ie the group to an activity characterized by the inability to manipulate objects and severely limited ability in performing simple activities;
- There is a group in a particular group of children according to age;
- The assumption that the level of motor development and global function is different from one child to another has been validated;
- The assumption that few children with cerebral palsy often to functional independence has been validated.

### Conclusion

The studies included in the research allow us to highlight some conclusions regarding the degree of manifestation of cerebral palsy and increased functionality. Level functionality child is different and depends on the approach of specialists on intervention programs. Between the age of 4-6 years (18 children, representing 42.59%) was found that most of them with neurological disorders. In DGASPC there are four recovery centers where there are children without families (institutionalized) and institutionalized (part of families) following recovery programs.

Between neurological disorders, cerebral palsy are most and the level of functionality between children with cerebral palsy is different. Classification of motor development is done according to the active movements and motor function level and we can provide important data on the prognosis of the disease.

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## THE IMPLEMENTING OF PSYCHOMOTOR EDUCATION ELEMENTS IN THE INITIAL SELECTION OF 6-8 YEARS OLD CHILDREN IN FOOTBAL

Implementarea elementelor de educație psihomotrică în selecția inițială a copiilor de 6-8 ani la fotbal

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**Rezumat.** *Lucrarea promovează aspecte și elemente de noutate din selecția inițială a copiilor de 6-8 ani la fotbal, care sunt deja aplicate în fotbalul italian. Accentul cade asupra elementelor de educație psihomotrică acestea fiind cele mai oportune pentru această vârstă, detaliindu-se testele și probele specifice care au fost abordate. Partea teoretică a lucrării argumentează necesitatea acestor elemente în cadrul evaluării selecției primare a copiilor la fotbal și prezintă situații concrete din fotbalul italian. Sunt prezentate de asemenea și rezultatele obținute de către subiecții cercetării atât în varianta inițială cât și după un an de pregătire.*

*Cuvinte cheie:* selecție, evaluare, elemente de educație psihomotrică.

**Abstract.** *The paper promotes novelty elements and aspects of the initial selection of 6-8 years old children in football, elements that are already applied in Italian football. The emphasis is on elements of psychomotor education, which are the most appropriate for this age, detailing the specific tests and trials that have been conducted. The theoretical part of the paper argues the necessity of these elements in the evaluation of the primary selection of children for football and presents concrete cases from the Italian football. The results of the research subjects are also presented, both the original numbers and the ones taken after a year of training.*

*Keywords:* selection, evaluation, elements of psychomotor education

### Introduction

Each sport requires a particular *selection strategy* based on its patterns. A major criterion of the recruitment strategy is the "optimal age". In the last 10-15 years it has become very clear that the optimal age for selection in football has dropped significantly and it now situates somewhere around the age of 6-7.

The Romanian Football Federation understood the necessity of starting the selection process of children at a very young age and urged all football clubs and departments in the country to implement this concept. At the same time, the Federal Coach School has decided in favor of the preparation of coaches specialized in the training of very young children, aware that working with 6-8 years old children requires certain peculiarities, coaches being faced with special situations imposed by age specific anthropometric, metric and psychomotor features. In this sense, Romania has aligned itself with the great powers of football. Italy is currently conducting the same selection strategy regarding the age of young children. The major difference, however, is that the selection aims to boys and girl alike, a chapter in which our country is extremely deficient.

*In the purpose* of implementing new features during the initial selection of children aged 6-8 in football, we started a collaboration process with the technical staff of Hellas Verona football club from Italy, who is involved in working with children and juniors of the club.

*The objectives* of this initiative were the following:

- A direct observation of the Italian initial selection process in specific children groups;
- Identifying the novelty elements during the selection process;
- The comparison of common aspects and elements that can also be found in the initial selection in Romania;
- Acquiring, adapting and applying elements of psychomotor education in the subjects of the testing group.

Along with the advancement of the collaboration, initial findings occurred regarding the similarities and differences between the Romanian and Italian schools, seen from the point of view of the whole training- testing-selection process

From the first moment of contact with the children and juniors department of the club from Verona, we noticed the net difference in the concept of choosing the staff in charge of selecting and promoting the young athletes. While in the majority of children and juniors divisions from Romania there is a single coach in charge of a specific age group, in Italy (for example, at Hellas) there is a whole staff in charge of training, consisting of a head coach, a secondary coach, a coach for the goalkeepers, a physical trainer and a fully available health professional.

In the little ones locker room from Hellas our attention was caught by several span-broad tips listed for them to see, words with a real impact on the mind of the players. “Trust in yourself”, “Be glad you’re playing football”, “Always be positive”, “Always concentrate”, “The team comes first”.

Although these words might seem too “big” for 6-8 year olds, the coaches are the ones that, through mobilization, individual discussions and personal example will implement these sayings in the minds of the little ones. In Italy a great emphasis is placed on the attitude of the football player, regardless of his age. The ambition, the desire to win, the will to prove superiority in terms of an ideal fair-play are important advantages in football movement.

Specialized literature from Italy contains a number of guidelines regarding the capacities of children and young juniors, as the following (Bedin, (2009): *Corso integrativo per l’abilitazione ad Allenatore di Base riservato ad Allenatori Giovani Calciatori*):

➤ **Coordination capacities**

- *Learning the movements* ( between 6 and 12 years);
- *Differentiation and control* (between 6 and 12 years);
- *In space* (between 6 and 14 years);
- *Keeping space* (between 6 and 13 years);
- *Maintaining the balance* – (between 7 and 12 years)

➤ **Physical capacities**

- *Resistance* – starting from 6 years;
- *Speed* – between 6 and 14;
- *Strength* – after the age of 8;
- *Flexibility* – starting from the age of 6, (with good results after the age of 11).

➤ **Affective and cognitive capacities**

- Starting with the age of 6-7 and continuing after the age of 15.

➤ **Laterality and ambidexterity**

- In Italian football the number of left feet players is almost equal with those from Romania : 26% in Italy, 22%in Romania.

Laterality is considered one of the genetic characteristics of the individual (hereditary), a theoretical aspect that is not always valid. Social environment might have an influence over the case of an individual's behavior.

Football is a part of several team sports where ambidexterity represents a goal of the training process. The entire training process of the player aims, in addition to learning the technical skills and understanding the tactic concepts, towards mastering the skill of taking control of the ball with both feet. Achieving a very good level in ambidexterity raises the individual value of the respective player and at the same time facilitates his expression in the field.

The Italian concept, as well as the Romanian one, is that training the little children must be geared towards the use of the dominant leg, after which the training of the non-dominant leg must follow.

The initial evaluation is done through game. We are not talking about the proper *primary selection*, but about the first contact with the newcomers. There is usually no question of elimination, safe from otherwise unambiguous situations, regarding obvious inabilities or medical problems.

I have determined while following the selection methods used by the coach of the 6-8 years old children from Hellas Verona that a special attention is given to left legged children. Both in Italy and in Romania a considerable difference can be seen between children using their right leg as the dominant leg, and the ones using their left leg. In time, it is intended that every child has to easily use both his legs in kicking the ball, but his native qualities are extremely important. Once the coach has established a starting lot for the training- testing- selection process, the children enter a rigorously organized training program that will result in the *primary selection* of the children with real qualities for football.

The contact with Hellas Training Center for Children and Juniors has revealed large gap in our training-testing-selection program in groups of young children, namely a minimal or nonexistent concern for the psychomotor aspect of the training process.

Specialized literature emphasizes on the opportunity of understanding the notion of **psychomotor education** as well as the importance, sometimes crucial, in completing the selection process of the future performers.

Valentina Horghidan assessed that “*psychomotor education starts from the understanding of the being inside its unity and globalism and tends towards an education of the person (especially the child) through the activity of his body*” (Horghidan 2002:41).

The subject of “psychomotor education” is a delicate one and, unfortunately, very little considered in Romanian sport. The financial difficulties of the majority of our country's clubs make for a very difficult collaboration with the experts in psychomotor studies. We confess that this issue concerned us, we understood its meaning and we are trying to have a more realistic approach to the methods of testing the children. We are periodically testing 6-8 years old children and the results undergo an expert's consideration. The conclusions are extremely interesting and useful.

*Hypothesis of the research* We believe that the continued application of modern evaluation methods through specialized tests, both in terms of football and physical and psychomotor training, results in an immediate improvement in the performance of the little athletes.

Given the young age of the subjects, placing the evaluation results between known statistical parameters can not be a decisive selection criterion.

Developing psychomotor skills constitutes a primary objective in the game of football taking into account the minimal requirements of the game: technical skill in terms of speed, sustained effort, concentration.

## Materials and methods

Testing the children aged 6, 7 and 8 present at the 2011 selection has shown us that from this point of view the level is as expected and very encouraging. We did not encounter major issues and the conclusion was that all those who showed up for selection are able for practicing the sport in psychomotor terms.

We have selected from the test suggestions several exercises that we thought were more interesting and very conclusive for 6-7 years old, such as:

### 1. for general motility:

- maintaining movement on a line drawn with chalk, on a 2m distance, walking by placing the heel of a foot in front of the tip of the other one;
- retaining his balance for 30 seconds while standing on one leg, with the other one bent (alternating right and left);
- standing on one leg, the other one stretched in front at 30-45 degrees, for 10 seconds and the eyes closed;
- dribbling the ball towards the pointed direction;
- stands hung for 15 seconds;
- stands hung, in a semi-traction on the horizontal fixed bar, for 8-10 seconds, sustaining his own weight;
- catches a tennis ball, thrown from 1.5 -2 m, using one hand.

Additionally, for the one aged 7 and 8, we added the following tests:

- jumping in one foot on a distance of 3-4 m, with the other foot bent in the back and held with the hand;
- squatting, on the tip of the toes, with eyes closed, for 10 seconds;
- standing jump over a bar (string) located at a height of 35-45cm;
- standing in balance for 10 second, alternating the right foot with the left one;

### 2. for body schema:

- recognizing and naming the different body positions (squatting, recumbent, sitting);
- associating different objects with different body parts (gloves- hand, boots- feet, etc.)

### 3. for laterality:

- recognizing the "left-right" notions on his own body (foot, hand, eye, ear);
- recognizing the "left-right" notions on the body in front of him, in the mirror;
- simultaneous coordinating movements (ex.: the index finger of the left hand on his nose, the right one on his left ear, etc.);

### 4. perceptual- motor time actions:

- ability to memorize the order of displayed objects (picture);
- ordering a series based on speed or duration;
- ordering certain objects on the indicated criteria (by height, by width, etc.)
- knowing how to read the clock;
- ordering hours on the “morning to dawn” criteria;

5. *The Burdon test – for capacity of concentration:*

It is the so called “barrier” test; a long sequence of letters (the original matrix has 504). It is established a random identification of three of those letters (ex. A, S, V), ticking them in a time frame of 3 minutes. At the end of the allotted time, proceed to count the letters ticked correctly and incorrectly, as well as those omitted. The evaluation is made according to the calculation formula:

$CC = LC - LG / LC - LO$  where: *CC = capacity of concentration; LC – correctly identified letters; LG = incorrectly identified letters; LO= letters omitted*

In repeating the test after a time frame of max. 30 days, the child must improve his performance by 3-6 correctly identified letters.

6. *Matorin test – for general coordination:*

The subjects perform a pirouette jump in the air and try to spin as much as they can around their own body axis. It is also observed, in addition to the rotating degree size, that the subject: *does not loose his balance; retains the position of his hands;*

Three pirouettes are executed towards the left side, and three towards the right side, taking into consideration the best performance of the three tries. The test conducted on 10 subjects, from the 6/7 years age group (and repeated after three months of specific training) confirmed the expectations: Coordination improved significantly, ground detachment having an increased amplitude (Table. 1).

*The grading standards are:* very good: over 360°; good: 270° - 360°; satisfying: 180° - 270°; unsatisfactory: less than 180°.

Table 1. *Matorin test, applied to the children of 6 and 7 years old, during the primary selection phase*

	Right		Left		Observations
	Pirouette		Pirouette		
	Initial (grades)	After 3 months (grades)	Initial (grades)	After 3 months (grades)	
S1 – 6 years	270	305	320	> 360	Child, left foot
S2 – 6 years	290	335	270	325	
S3 – 6 years	300	> 360	280	335	
S4 – 6 years	285	320	270	335	
S5 – 6 years	300	> 360	285	330	
S6 – 7 years	305	350	340	> 360	Child, left foot
S7 – 7 years	320	> 360	295	350	
S8 – 7 years	335	> 360	290	340	
S9 – 7 years	290	340	320	> 360	Child, left foot
S10 – 7 years	330	> 360	285	345	

It is easily noticeable the improvement of performances in all the subjects even if not all of them can reach the qualifying of *very good*.

In table 2 we can observe the results of the Matorin test conducted on a group of 10 subjects aged 8, at the end of a training cycle over the duration of one year.

Development through training the motor capacities in conjunction with acquiring the basic elements of school plus the development of movement coordination made the performance of the little football players grow. Ground detachment is done with increased amplitude, the help coming from the hands becomes decisive. Thus, the ability to perform a pirouette of minimum 360 degrees, both towards right and left, was achieved by the majority of subjects.

Table 2. *Matorin test, applied to children of 8 years old, after one year of training*

	Right Pirouette (grades)	Left Pirouette (gradea)	Observations
S1 – 8 years	340	350	
S2 – 8 years	> 360	> 360	Child, left foot
S3 – 8 years	> 360	> 360	
S4 – 8 years	> 360	> 360	
S5 – 8 years	> 360	> 360	Child, left foot
S6 – 8 years	350	340	
S7 – 8 years	> 360	> 360	
S8 – 8 years	> 360	350	
S9 – 8 years	> 360	> 360	
S10 – 8 years	> 360	> 360	Child, left foot

#### 7. *Romberg Test –for vestibular balance*

The Romberg test is a test used for highlighting proprioceptive disorders. It is based on the appreciation of the capacity of retaining the balance in the absence of visual incentives. The subject's capacity of retaining the balance in a special position is observed: the feet one after the other on the same line (heel to toes), the eyes kept closed and the hands stretched to the front.

The time frame in which the child stays balanced, without moving his soles is counted. The result is considered a very good one if the balance is maintained for a minimum of 30 seconds. A Romberg test conducted on the entire group of 6-8 years old athletes in organized training emphasized, as a general conclusion, really good level of vestibular balance, with the exception of two athletes under the value of 30 seconds, but extremely close to it. (26, respectively 24).

Specialist studies in the field identified the existence of a maximum efficiency period in the development of psychomotor aptitudes, a period they named "optimal educative timeframe" and they situate it between the ages of 6 and 10. In any sport, besides an athlete's technical skills, the psychomotor development in superior parameters contributes with maximum efficiency to the achievement of remarkable results.

Zazzo (1970) believes that: *educating the motility means training the child for professional service, but, at the same mean, it also means relieving his physical and mental balance, gradually giving him ownership of his body, multiplying efficient relations with things and harmonious relationships with other individuals.*

We believe that following the psychomotor evolution of 6-8 years old children is extremely important. Psychomotor tests can be extremely useful in finding potential issues some children might face.

#### **Conclusions**

Beyond being a professional, the coach must guide after some strong principles when he decides that he can work with groups of very young children. We think as essential for the future of the entire group, that the coach should get close to the children who come to the selection. Of how tactful he is depends, surely, how relaxed the children are, how much they enjoy the tasks they must do, their wish of being noticed, their wish of being the best.

The coach whose job is to prepare and select this little football players must create a very friendly environment where the preparations happen. At the same time he must be preoccupied of making a civilized climax, without tensions between he and the children or between the children and he must not tolerate acts of indiscipline.

A priority for us, at the end of a first cycle of preparation from the age of 6 to the age of 8 is for the selected players to prove the assimilation of some elementary technical procedures as:

- Precise pass across, standing and in motion
- Directing the ball with the head to the desired area
- Safely taking the ball and keeping it under control

The activity of a coach, whose task is to find, to shape and to select the smallest football players is reflected in the number of promoted athletes to the superior phase of preparation and their quality of football expression.

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## THE EFFICIENCY OF LEARNING ENDURANCE THROUGH THE USE OF THE DIFFERENTIATED INSTRUCTION IN PHYSICAL EDUCATION LESSON

Eficientizarea învățării alergării de rezistență prin utilizarea tratării diferențiate în lecția de educație fizică

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**Rezumat:** Educația fizică școlară, în calitate de proces instructiv-educativ reunește o varietate de forme de organizare, orientări, tendințe metodologice, principii, obiective, metode, mijloace, permanent îmbunătățite și adaptate de către specialiștii domeniului la cerințele sociale ale sistemului. Adaptările metodicii educației fizice și sportului, realizate în vederea creșterii performanțelor motrice ale populației școlare s-au raportat și se vor raporta întotdeauna la aspectele cotidiene ale vieții și la caracteristicile individuale ale omului. Lucrarea de față propune o abordare, deloc nouă, dar eficientă a lecției de educație fizică din învățământul gimnazial, care presupune desfășurarea activității pe grupe valorice, în funcție de particularitățile elevilor. În acest sens vom apela la tratarea diferențiată, care din punctul nostru de vedere răspunde necesității diversificării conținutului activităților de educație fizică pentru eficientizarea învățării alergării de rezistență.

*Cuvinte cheie:* tratare diferențiată, alergare de rezistență, lecție de educație fizică, module operaționale

**Abstract:** As an instructive-educative process, the physical education brings together a variety of organisation forms, guidelines, methodological principles, goals, trends, methodes, means, constantly improved and adapted by the specialists of the branch to the social needs of the system. Adjustments to the methodology of physical education and sport, made in order to increase the motric performance of the school population were related and will always be related to the everyday aspects of life and the individual characteristics of each subject. The present paper proposes an approach, not new, but effective of physical education lesson in secondary school, which involves the development of activity on value groups, depending on the student's particularities. In this regard we appeal to the differentiated instruction, which from our point of view responds to the need to diversify the content of physical education activities for the efficiency of learning endurance running.

*Keywords:* differentiated instruction, endurance running, physical education lesson, operational modules

### Introduction

A current problem of instruction and education is represented by the ways of transmission of informations and knowledge. These ways are subject to increasingly more creative and innovative ideas, given the compliance with the educational ideal of the society. In this context it is imperative to underline the complexity and necessity of applying methods that could lead to achieving the educational ideal in a general sense and the meaning of physical education and sport in the narrow sense, of the finalities and competences.

One of these methods is differentiated instruction. Radu (1978) argues that differentiated instruction is aimed at adapting the learning activities especially in terms of content, form of organisation of teaching methodology, and the different possibilities of students, to the ability of understanding and it's own pace of groups of students or even each student individually.

Knowing the particularities of the individual represents a starting point to find the most suitable means and methods of transmitting the information through the content that students should develop according to their own possibilities.

Perrenoud *quoted* by Marin (2010) defines the differentiation in education as an organization of activity "in such a way that each student to be constant or more often confronted with the most productive didactic situations for him".

Tomlinson (2001) defines the differentiated instruction as a process of "an assurance to what student learns, how he or she learn and how the student shows that what he or she learned is a match for the level of preparation of the student, his (hers) interests, and his favorite way of learning".

In the physical education lessons, the differentiated instruction find its usefulness by the fact that not all students who have relatively the same chronological age has the same motor skills, physical, psychomotor and psychological. It is well known that in the physical education lesson are used means and methods that varies from class to class, even if they are part of the same year of study and are thought by the same teacher. Thus, the differences between individuals require graduation applications depending on the opportunities available to each and staggering levels for the purpose of generating and obtaining optimal results.

These various requirements is achieved through value groups, pledged at the time that the subjects know to collaborate and have through knowledge about teamwork. These are not made up in haphazard manner, but are the result of performance obtained by each student in initial assessments.

These value groups have two characters: closed and open. The most common are open, dynamic groups in which

the students, depending of their results, can change the value group within the same lesson, either from one lesson to other. Instead, closed groups are characterized by maintaining the initial assessment to the final evaluation of the same group.

In conclusion, the differentiated instruction, involving the pursuit of value groups, depending on the specific characteristics of the subjects, it becomes a major coordinated examination and development of the individual personality.

### Purpose, objectiv, hypothesis

*Purpose:* The purpose of experimental research aims the optimization of physical education lesson by approaching a method, but also a principle – the differentiated instruction.

*Objectiv:* The main objective of the research is optimizing the motor skill endurance running, through the development of practical programmes differentiated in accordance with the morphological, functional, motor and psychological particularities of the students in order to increase the yield on motricity plan.

*Hypothesis:* through the use of differentiated instruction in the physical education lessons will achieve an improvement of the technique and performances of students from 5th in the case of athletic skill endurance running.

### Methods and materials

In order to elaborate the theoretical, practical and experimental approach we appealed to the scientific methods, specific and widely known for our field: the study of specialized literature, planning documents, the method of observation, the experiment, the experimental variables, statistical and mathematical method, statistical indicators arithmetic mean, standard deviation, coefficient of variation, correlation coefficient, Spearman method, graphic method.

The research subjects were 5th grade students, girls and boys from "Grup Școlar Constantin Brâncoveanu", Horezu, district Vâlcea. For validating the hypothesis were established two classes: 5th C and 5th D, totaling 46 students (Fig. 1):

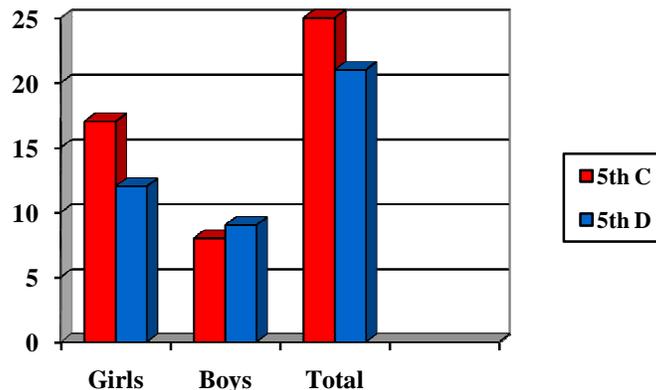


Fig. 1. Number of girls and boys enrolled in research

The activity was held in physical education lessons in programs spread over four days a week, 45 minutes per lesson. The research was conducted between 1st november 2008 – 30 april 2009. The samples used in research was:

- Endurance running – performance
- Endurance running – technique of the step in semifond running, high start learning

During the lessons for motor skill we will work on value groups resulting from the initial assessment applied for performances and for technique. The performance obtained for a subject was converted into grades, according with The National School Assessment System in Physical Education. Each subject was tested and received a grade. then the arithmetic mean between the two grades and thus the value of the group which the subject belongs

For example, the student H.A. obtained at the initial assessment 2'42". According to the The National School Assessment System in Physical Education, the grade is 10. When evaluating the technique, she obtained the grade 10, which determined the average of the two notes - 10 and the student joined the value group I.

In the lessons were established additional measures in the process of educational structure and physical effort for each value group, for girls and boys. In the value group II and III, in the process of development of the endurance running, the measures consist in: facilitation practice conditions, the use of simple exercises, the decomposition of some movements into distinct parts, the use of lightweight materials that capture their attention, repeating the demonstration model, support to perform some exercises with higher degree of difficulty, further demonstrations. The exercises we used had the following parameters: high number of repetitions, low intensity. We also offered them emotional support.

For the first value group we have higher requirements: high intensity, more repetition of motor acts and actions. We called initial and final assessment relating to their following, for each sex separately. The dividing into value groups was performed using the evaluation system grading scales included in the curriculum and the autonomy of physical education teacher for giving the grades 6, 7, 8, 9, and 10 and for technique evaluation, because this one isn't contained in The National School Assessment System in Physical Education.

Dividing on value groups (I, II and III) was achieved the following grades (average), thus (Table 1):

Table 1. *The average for dividing into value groups*

Value group	I	II	III
Grade	10 – 9	8.99 – 7	6.99– below 5

## Results

The initial and final assessment included a different number of students, according to the value group. After applying the differentiated programme the group's structure was noticeably modified (table 2):

Table 2. *The number of girls and boys at the initial and final assessment*

Assessment	Gendre	Value group		
		I	II	III
Initial	Girls	3	4	10
assessment	Boys	1	3	4
Final	Girls	10	5	2
assessment	Boys	3	4	1

*The analysis and interpretation of the results achieved by the experimental group in the initial and final assessment*

*Girls.* The average value obtained by experimental group at the evaluation of motor skill endurance running at initial assessment is 6.23, while at the final assessment is 8.17. Between the two values we recorded a difference of 1.94 points. Also, we observed a migration of girls from the second and third value group to first value group. The homogeneity of groups at the initial assessment is almost non-existent (53.19%), while at the final assessment is big (15%).

The standard deviation is 8.04 at the initial assessment and 1.33 at final assessment. The Spearman correlation coefficient has a value equal to 0.84 (very good correlation) and "t" test is equal to 5.99. For a statistical significance the calculated value of "t" must be greater than tabular value read at  $n - 2$  in Fisher Table. The tabular value is 2.08, therefore research hypothesis is confirmed.

*Boys.* The values recorded at the final assessment are better than the values at the initial assessment. The average mark at the initial assessment is 6.62 and at the final assessment is 8.50 for motor skill endurance running. We noted a difference of 1.88 points in favor of the latter testing. The homogeneity is different: at the initial

assessment is little and at the final assessment is moderate. The standard deviation at the initial assessment is 1.76 and at the final assessment is 1.41. The Spearman correlation is 0.81 (very good) and "t" test is 3.34. For a statistical significance the calculated value of "t" must be greater than tabular value read at  $n - 2$  in Fisher Table. The tabular value is 2.44, therefore research hypothesis is confirmed.

*The analysis and interpretation of the results achieved by the experimental group and the control group at the final assessment*

*Girls.* At the final assessment, the average mark was 8.17 for experimental group and 6.41 for the control group. He have an advantage of 1.76 points for experimental group, the group that benefit of differentiated instruction.

*Boys.* Following the comparative analysis between the two groups, 5th C grade and 5th D grade, at the final assessment we notice that the average of marks achieved by the experimental group is higher than the average achieved at the same tests by the control group, meaning 8.5 and 7.11, thus noting a 1.39 points differences.

### Conclusions

In the physical education, the differentiated instruction is a method conditioned by knowing the principle of respect for age and individual peculiarities whose applicability lead to learning specific educational content, through the maximum valuation of motor potential of each student. As a result of recording and analysing data it could be observed that the hypothesis has been confirmed and we established the efficiency of learning endurance running in the physical education lessons through the use of differentiated instruction.

We affirm that the differentiated instruction held on value group stimulates competition, ambition, motivation to promote superior samples.

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## IMPROVING BACK PAIN IN PERFORMANCE ATHLETES THROUGH PHYSICAL THERAPY

Ameliorarea lombalgiilor la sportivii de performanță

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**Rezumat.** *Lucrarea de față prezintă o modalitate de optimizare a recuperării afecțiunilor coloanei vertebrale la sportivii de performanță (halterofili și atleți). La acești sportivi volumul și intensitatea efortului foarte mare determină frecvența apariției lombalgiilor. Eșantionul a fost compus dintr-un număr de 10 subiecți, componenți ai loturilor sportive de performanță juniori și seniori (atletism și haltere) dintre care 8 sportivi de sex masculin și 2 sportivi de sex feminin, cu vârste cuprinse între 14 și 24 de ani. Implementarea unui program de exerciții aparținând diferitelor tehnici kinetice, atât la începutul cât și la sfârșitul antrenamentelor constituie o metodă de optimizare în pregătirea halterofililor și a atleților.*

*Cuvinte cheie: sportiv de performanță, kinetoterapie, coloana vertebrală lombară*

**Abstract.** *The paper presents a mode of increasing the rehabilitation of lumbar spine in performance athletes. In the sport of weightlifting and track performance-jumping, high volume and intensity of exercise determines the frequency of back pain. The sample was composed of a total of 10 subjects, members of professional junior and senior sports lots (athletics and weightlifting) of which 8 male athletes and two female athletes, aged between 14 and 24 years. Implementation of a program containing physical therapy exercises from different techniques, both at the beginning and end of training is an optimization method in training weightlifters and athletes.*

*Keywords: 3-5 keywords: competitive athletes, physiotherapy, lumbar spine*

### Introduction

In this paper we look at the impact on the intervertebral discs due to repeated influences of exercising at a certain volume, intensity and frequency in athletes. In the sport of weightlifting and track performance-jumping, high volume and intensity of exercise determines the frequency of back pain.

*The main goal* of this research is to support the athletes who suffer health problems in this regard, helping them through physical therapy to rebuild their health and to be able to continue their sports performance at the highest level.

*Objectives of the paper*

- Detection of athletes who complain of spine pain during training and competitions
- Develop accurate and easy applicable recovery program, with the active participation of the athlete.

*The working hypothesis.* *By performing kinetic treatment we obtain a reducing of the pain and dysfunction in the lumbar spine in athletes. Implementation of a program containing physical therapy exercises from different techniques, both at the beginning and end of training is an optimization method in training weightlifters and athletes.*

### Research Methods

In order to achieve the goal and objectives, we used the following methods: bibliographic study, documentation method, observation method, interview and questionnaire-based survey method and the graphic method.

Weightlifting specific pathology is represented by the trauma of the skin, muscle, tendon, joint, sacroiliac disorders, ligament injuries, joint injuries (knee and elbow), rare bone fractures, but the most common is low back pain. Pressing the lumbar spine during the workout leads to back pain. Pathophysiologically, these injuries appear by repeated loadings that lead to fractures of the vertebral plates and nutrition – circulation disorders that lead to disc damage. Symptoms: pain and paravertebral muscle stiffness. This back pain can occur acutely by sudden lifting dumbbell or chronically through repeated high load.

Muscle that are inserted along the spine develop impressively large force, hundreds of kilograms, through shrinkage, especially during mobilization of the spine. We must also add the mechanical contribution of the trunk, thus of the spine in all situations that imply carrying weights, which considerably increase the pressures.

Note that the column pressure changes constantly depending on the position taken, by the movement made, and the over filling occurred when lifting a weight. See some examples in the table below (after the studies of Nachemson).

Table 1. *The pressure on the lumbar spine in various situations* (Bigos S. J., 1992:21 – 34)

Prone 20°	60 kg
Prone 40°	120 kg
Prone 20° with 20 kg	122 kg
Prone 20° ,rotated 20° with 10 kg	215 kg
Lifting 10 kg, straight back, flexed knees	174 kg
Lifting 10 kg, bent back	194 kg
Outstretched hand with 5 kg	194 kg

*Athletism* is defined as a system of exercises designed as running, throwing and stylized jumping, in order to develop specific physical qualities and achieve a better result in their practice (according to the *Terminology of physical education and sport, 1974*).

Specific pathology of the athletic trials: most pathological aspects are related to the upper limbs, shoulder girdle, lower back and legs, which are supporting the anatomofunctional specific effort.

*Presentation of the sample lot and venue of the trial*

The sample was composed of a total of 10 subjects, members of professional junior and senior sports lots (athletics and weightlifting) of which 8 male athletes and two female athletes, aged between 14 and 24 years.

The study was conducted between May 2012 - November 2013, in the city of Bucharest. The purpose and methods of the study were explained to the participants, who were willing to participate voluntarily in its realization.

The athletes were evaluated clinically and through MRI (MRI lumbar spine). To quantify the pain felt by the subjects Visual analogue scale pain assessment (VAS) was used, which is internationally approved and, after Johnson (1997), Wiese-Bjornstal (2002) is frequently used in medical research to determine the intensity of pain.

It consists of a straight line with a length of 10 cm, which has or does not have verbal descriptors (short sentences understandable) to its ends (the descriptor "no pain" at one end and "severe pain" to the other end). Athletes answered the question "What grade would you give to the pain on this scale?", Indicating a grade from 1 to 10.

Anamnesis showed that 8 out of 10 athletes were faced with low back pain. Note that the subjects, as athletes, may have a better tolerance to pain, therefore a higher threshold.

2 of 10 subjects were not charged back pain during the examination or in their medical history. However, examination and MRI showed degenerative changes in their lumbar spine. Athletes who have undergone study showed: early disc degenerative changes, changes in lumbar vertebral axis, intervertebral lumbar vertebral body slipping, disc protrusions, herniated lumbar disc and inter intraspongiosa, listezis. When they were questioned, only 4 of 10 athletes claimed to have benefited from recovery programs in the past.

In the realisation of this study we took into account the objectives of a recovery program optimally individualized for each athlete:

- Improving the painful symptoms;
- Fighting the inflammatory process;
- Fighting paravertebral muscle contractures;
- Supple lumbar spine;
- Improving static and dynamic vertebral changes;
- Maintain / increase joint mobility;
- Maintain / increase muscular strength and endurance;
- Maintain exercise capacity;

- Maintaining mental status and, where necessary, improve painful symptoms and disorders induced by removal of competitive activity (anxiety, sleep disturbances);
- Establish maintenance program.

The recovery program must take into account the characteristics of each sport, to be individualized according to the intensity of pain, the etiology of the sport, the preparation period and the availability of competitive athletes.

We must consider the benefits and also the risks of a rapid recovery treatment in order to avoid a superficial assessment of the health of the athlete and especially to make the correct diagnosis, returning the subjects to competitive level athletes. Sometimes athletes minimize their symptoms to avoid being removed from competition (Murgu, 2009: 73).

The objective symptoms were collected by specific tests and measurements such as inspection, palpation, percussion, analysis parameters muscle strength and joint mobility, sensitivity tests, tests of elongation.

Following these observations we initiated prophylactically protocol recovery of athletes over 18 months - a year and a half, from May 2012 - November 2013, to stop or slow down the evolution of degenerative lumbar intervertebral discs.

I wanted to reduce or as appropriate, obtain a reduction of pain at lumbar paravertebral level and reduce neurological symptoms at some spot in the practice of sports performance.

It was assumed that performing during training and at the end of exercise will improve health by reducing the painful symptoms during paravertebral muscle contractions and relaxation / supple spinal, pelvic and scapular-humeral belt.

Regarding athletes that had no positive neurological signs revealed by clinical examination, but paraclinical examinations (MRI) showed changes in the intervertebral disc, initiating the kinetic had a prophylactic role. There is strong evidence from the systematic retrospective studies regarding the advice to stay active as much as possible, resting being abandoned. This is actually the first step in the current guidelines. (Romanian Journal of Physical and Rehabilitation Medicine (2008: 96)

"Exercise is an important morpho - genetic factor especially for musculoskeletal elements. The bones and periosteum, joints and muscles, tendons and fascia have a functional structure so obvious that acquires the meaning of a graphical representation of mechanical forces that the static and dynamic actions perform on them." (Fozza, 2002: 10)

Physical training specific for performance sports (weightlifting, athletics) requires adaptive physiological changes of the osteoarticular and muscle system. The mechanical actions exerted on the column (jumps and landings of different samples athletics, lifting weights) cause paravertebral muscle contraction, subsidence of the vertebral body, disc degeneration. Therefore I will try to counteract through exercises of physical therapy program, the negative impact of the repeated microtraumas over the myo-arthropod-kinetic system.

Performing intra and post effort exercise help in obtaining relief in muscles and joints and reduce physical fatigue.

Means of recovery of active rest applied intra-effort aims at providing some amount of rest in order that the athletes can continue efforts with redone potential, allowing the quick and effective recovery of the functional systems of the body to a working condition.

During recovery, relative rest is adopted in order to maintain physical fitness, general rest will be adopted only in exceptional circumstances.

The WILLIAMS method is extensively tested and verified as having excellent, stable and efficient results. This method is applied in three distinct phases, depending on the patient's clinical and functional background.

Applying this program in permanent conjunction with clinical and functional professional evaluation of the treating physician and physiotherapist result in loss or braking of lumbar intervertebral evolution.

McKenzie Method - Based on "poor type of motion" which means lack of extension (note of high importance of McKenzie) it proposes to mobilize and appropriate exercises mainly' in extension '. If we take into account that the migration of the pulposus nucleus is causing pain over a period of time and linking this with the appropriate physical therapy exercises is obvious that his method has a beneficial impact on the patient as soon as he began the specific physical therapy program, ie in extension. (Moraru, 2008: 61-68)

Among active means that we have applied to the mid-term recall gymnastic exercises joint training, stretching and relaxation with calm walking and wide and controlled breathing exercises:

- Adoption of analgesics posts supine position, lift the head and shoulders on a pillow, knees bent with a roll under her feet resting on the soles (2 min) lateral decubitus, maintaining posture in "cock rifle" (2 min).

- Rocking the whole body vertical, hung from the trellis to release or reduce muscle contractures. Rocking is amplified by attaching small weights to the ankles (1 min).
- Slow and rhythmic swaying of the upper limbs (1 min).
- Stretching for back muscles (2 min).
- Breathing exercises performed in standing position with the spine in rectitude, nasal, rhythmic, with lowering the diaphragm, bulging abdomen and lifting the shoulders remoteness coast (2 min).

The physiotherapy program proposed for end of training lasts about 10 minutes and consists of performing exercises belonging to Williams and McKenzie methods.

- Ex. 1 Supine, knees bent: lomb push to bed, be swung up the sacred (lomba always remain in contact with the bed), shrink waist - supple lumbar. 3set x 12r / pause 20 sec.
- Ex. 2 Standing position, for correcting lordosis is strong flex abdominal wall; maintain 5 seconds, is repeated. Transverse abdominals toning exercise. 3set x 12r / pause 20 sec.
- Ex. 3 "Bridge" execution: from supine with the knee flexed, shoulder support - back and legs, rose hip and lomb (without lordosis). Exercise can run and iliac crests resistance. Exercise strengthens the lumbar extensor muscles. 3set x 15r / pause 20 sec.
- Ex. 4. Quadrupeds - lifting up and spread to the horizontal one leg at a time, maintaining 10 sec., Return, ditto with the opposite leg, return to PI 2 set x 15r / pause 10 sec
- Ex. 5. Sitting, lunge forward, the front support leg, the other stretched lower back, return and repeat with the other leg. 2 set x 10 r / pause 10 sec.
- Ex. 6. Of quadrupeds, looking forward, lift the opposite arm and leg, both members being in extension, inspiration, expiration comeback. 2 set x 15r / pause 20 sec.
- Ex.7. Of quadrupeds, while extending your knees, lifting and recovery tank. 3 set x 15r / pause 20 sec.
- Ex.8. Supine, thighs at 90 ° to the pool, is performed pedaling movement of the legs. 3 set x 15r / pause 20 sec.
- Ex.9. On your knees, sitting on heels, grabbed the ends of the stick at your neck, lifting the pelvis with mild extension of the trunk and head, then return. 2 set x 15r / pause 20 sec.
- Ex.10. Sitting remote, support ahead sitting down on a vertical stick, making a slight tilt trunk extension ahead and return. 2 set x 10 r / pause 20 sec.
- Ex.11. Physioball prone on hands grabbing a strip of trellis, run through flexion and extension cylinder elbows. Version - running on physioball supine position cylinder 3 set x 10 r / pause 20 sec.
- Ex 12. Facing away trellis, trunk leans forward gradually, by lowering the hands trellis steps, return 2 set x 10 r / pause 20 sec.

## Results

Table 2. *Indicators evaluated before medical recovery*

Crt. No.	Pain VAS Scale	Static vertebral syndrome (paravertebral muscle contraction - lumbar)	Dynamic vertebral syndrome	
			Index - ground	Lasegue sign
A.M.	7	Existent	15 cm	+ 30°
C.I.	7	Existent	14 cm	+ 30°
M.V.	7	Existent	10 cm	negative
S.G.	2	Existent	10 cm	negative
V.R.	2	Existent	45 cm	+ 35°
S.D.	2	Existent	25 cm	negative
P.A.	0	Missing	4 cm	negative
G.E.	7	Existent	50 cm	+ 30°
S.V.	0	Missing	16 cm	negative
D.A.	2	Existent	13 cm	negative

Table 3. Indicators evaluated by medical recovery

Subjects	Pain VAS Scale	Static vertebral syndrome (paravertebral muscle contraction - lumbar)	Dynamic vertebral syndrome	
			Index - ground	Lasegue sign
A.M.	5	Existent	10 cm	+ 60°
C.I.	4	Existent	8 cm	+ 60°
M.V.	3	Existent	5 cm	negative
S.G.	0	Existent	5 cm	negative
V.R.	0	Missing	20 cm	negative
S.D.	1	Missing	10 cm	negative
P.A.	0	Missing	2 cm	negative
G.E.	4	Existent	25 cm	+ 60°
S.V.	0	Missing	8 cm	negative
D.A.	0	Existent	7 cm	negative

The analysis evaluated indices before and after the recovery period the following are noted:

- significant decrease back pain perceived by athletes after the application of kinetic treatment,
- neurological reassessment - negative Laseque or increased to athletes who showed low levels of this index at the initial assessment,
- static vertebral syndrome, lumbar paravertebral muscle contraction represented by net is reduced to six of the ten spot after medical recovery, which is explained by the decrease of pain perceived by athletes at the lumbar level (VAS).

### Conclusions

Both pain and spinal mobility, are influenced by physical therapy exercises consistently followed. Following the final clinical assessment reduction was noted in VAS pain scale at the lumbar spine after performing kinetic treatment by athletes, compared to previous painful period in which the impairment not done physical therapy. The final evaluation shows a net improved anteflexion compared to baseline, the index finger - score values below ground to clinical reassessment of athletes compared to the initial assessment. It is necessary to individualize the treatment and fairly monitoring of clinical and functional parameters. It is very important to respect the rules of a good development kinetoprophylaxy secondary to lumbar disease. Physiotherapy treatment is important in the development of athletes in both the short and long term.

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## EXECUTION SPEED OF SPECIFIC KARATE-DO PUNCHES AND KICKS IN PEOPLE AGED 30-60 YEARS, AS AN INDICATOR FOR THE QUALITY OF LIFE

Viteza de execuție a loviturilor în karate-do la persoanele cu vârste cuprinse între 30-60 de ani indicator al calității vieții

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**Rezumat.** Pentru realizarea obiectivelor propuse, am elaborat un program de pregătire, pentru dezvoltarea vitezei de execuție a loviturilor în karate-do specifice persoanelor cu vârste cuprinse între 30/60 ani. Programul de pregătire a ținut cont de particularitățile bio-psiho-sociomotrice ale participanților în cadrul cecetării de față. Au fost aplicate miloace de pregătire specifice care au fost împărțite pe cicluri de pregătire. Tema de față face parte dintr-o cercetare mai largă care are ca obiectiv principal evidențierea anumitor indicatori ai calității vieții și îmbunătățirea acestora prin practicarea karate-do-ului. La cercetarea de față participat zece subiecți cu vârste între 30-60 ani și au răspuns foarte bine programelor aplicate. Cercetarea aplicată de noi este de tip experimental. În acest sens, am considerat util folosirea metodei înregistrărilor video și măsurarea vitezei cu ajutorul unui program specific. La cercetarea de față participat zece subiecți cu vârste între 30-60 ani care au răspuns foarte bine programelor aplicate. Rezultatele cercetării arată o îmbunătățire a indicatorului măsurat de noi. În concluzie factorii determinanți pentru alegerea unei activități fizice la vârsta maturității pot modifica capacitatea individului de a-și îmbunătăți anumiți indicatori ai calității vieții.

*Cuvinte cheie:* viteză; lovituri karate-do; calitatea vieții

**Abstract.** In order to achieve the objectives of the research, we designed a training program specific to people aged between 30 and 60 years, necessary to increase the execution speed of karate-do punches and kicks. The training schedule took into account the bio-psycho-socio-motor particularities of each participant in the program. There were applied specific preparation means, which were divided into preparation cycles. The topic of this paper is part of a broader research that aims to highlight some indicators of the quality of life and to show how these indicators can be improved by the practice of karate-do. Ten subjects with ages between 30 and 60 years were selected for this research, and all of them properly responded to the applied methods. The experimental research used video records and speed measuring performed with the aid of special software. All participants responded very well to the proposed training program. The research results show a significant improvement of the indicators measured by us. As a conclusion, when choosing to practice a physical activity during the adult age, one must take into account some important factors that could determine the capacity of an individual to improve certain indicators of the quality of life.

*Keywords:* speed; kicks; karate-do; quality of life

### Introduction

This paper is a continuation of a previous research, but on a group of subjects with other characteristics, persons aged between 30 and 60 years, non-practitioners of karate-do or other sports until their involvement in our study.

Quality of life is influenced by several factors and indicators. In our research, we have tried to improve the execution speed of karate-do punches and kicks, because it is very important in this discipline and directly influences the quality of life of the research subjects, having in view their age. Therefore, we considered that this motor quality, speed, could be an indicator for the quality of life, and we applied a preparation program to improve it. The preparation program took into account the bio-psycho-socio-motor particularities of the participants in the research. There were applied specific preparation means, which were divided into preparation cycles. The topic of this paper is part of a broader research that aims to highlight some indicators of the quality of life and to show how these indicators can be improved by the practice of karate-do. We found that the persons over 30 years old included in our research needed a better execution speed to increase efficiency of the preparation process, so that it could also be helpful in their daily life. Specialty literature highlights the fact that speed is a major motor quality in karate-do. Execution speed in karate-do represents one of the most important forms of manifestation in competitions, because winning one or more points that bring the victory keeps, to a very large extent, to this execution speed, given that the punch or kick which is the first to reach the target, scores (Petre, 2014). Execution speed of some more complex movements or of a phase within a complex movement characterizes either an entire sports branch or a sports event (Nicu, 1993). Speed is a strongly genetically-determined quality, but it can be developed through training (to a much lesser extent compared to strength or endurance), and the gain in time, even small, is sometimes essential for the actions which, executed appropriately, may bring the victory in kumite” (Deliu, 2003). Dragnea and Teodorescu (2002) define speed as “the rapidity of performing the movement or motor act within the time unit”.

Thus, through our research, we want, on the one hand, to identify the accuracy of technical executions performed in the preparation process, an aspect that helps increase the execution speed of punches and kicks, and on the other hand, to achieve, through specific means, their consolidation and improvement.

*Objectives.* This research mainly aims to identify the accuracy of technical executions by applying a preparation program based on means specific to the age and preparation level of the subjects, which leads to an increase in the execution speed. We mention that this identification is materialized for the most frequently used karate-do punches and kicks. These objectives are achieved with means specific to the discipline and objectivized with the aid of the Quintic video motion analysis system, which measures the execution speed of the punches and kicks commonly used in training and competition, and selected by us for this research.

*Hypothesis.* The accuracy of performing punches and kicks in karate-do, obtained with the aid of some specific means adapted to the bio-psycho-socio-motor particularities, determines a higher execution speed.

### Subjects and methods

The research was conducted in the Karate-do Training Hall of the Suiko Sports Club located in UNEFS - Bucharest, equipped with all the materials specific to this discipline. The experimental-type research took place between 1 July 2014 and 30 April 2015, a period which included the following steps: subject evaluation - making up the work group; implementing and applying the preparation program specific to the theme; performing the specific training program; achieving the initial testing.

The 10 subjects of our research were persons who, on their own initiative, decided to practice a sport suitable for all ages. Only the subjects aged 30 to 60 years were selected. Practically, the selection was made naturally and, of course, depending on subjects' motivations.

The research subjects are presented in table 1.

Table 1. *The research subjects*

Item no.	Surname and name (initials)	Age	Gender	Profession	Residence
1.	C.M.	39	M	Lawyer	Bucharest
2.	S.I.	39	M	Lawyer	Bucharest
3.	C.M.G.	38	M	Engineer	Bucharest
4.	T.M.	56	M	Teacher	Bucharest
5.	C.D.	39	M	Lawyer	Bucharest
6.	A.V.	33	M	Engineer	Bucharest
7.	C.C.	37	M	Military employee	Titu
8.	M.D.	53	M	Teacher	Bucharest
9	A.I.	42	M	Sports instructor	Bucharest
10.	P.M.	42	M	Engineer	Bucharest

#### *Description and utilization of the Quintic video motion analysis system*

We underline that the Quintic system is a device designed for the motion analysis in sport. We also used it in our doctoral thesis entitled "Efficiency of moves relating to performer's stance during the karate-do fight". With the help of this highly reliable objectivization system, we managed to highlight the execution speed of karate-do moves, as well as their trajectories, and to notice the mistakes made during specific executions.

Among the characteristics and components of the Quintic system, we mention: recording and processing the motion-related data with two Panasonic cameras; Quintic-4 Biomechanics software; Sony Vaio laptop for lab or field work; identification/analysis of trajectories; Excel processing; image capture with one camcorder, manual digitization and "zoom" function; image capture at different frequencies; image capture with two camcorders; determining speeds and accelerations; synchronically combined video/pressure measurements.

#### *Specific preparation program*

We mention that specific means are original. They do not correspond to the old preparation means used in the sequence destined to learning and improving the punches and kicks under research. We also emphasize that the research subjects responded positively to the new preparation program implemented by us.

In the following, we present a model of centralized preparation table, with the means used during training.

Table 2. Model of centralized preparation table

Item no.	Specific preparation means	Dosage (R)Repetitions/(S)Series (Min)Minutes/(Sec)Seconds (Rou)Rounds 1 <sup>st</sup> cycle	8 weeks x 2 training sessions/ week = 16 training sessions																		
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
1.	Kizami Tsuki with right foot forward - emphasis on pelvis work (hara)	30R x 4S			x	x				x	x	x		x			x		x		
2.	Kizami Tsuki with left foot forward - emphasis on pelvis work (hara)	30R x 4S				x	x				x	x	x		x			x		x	
3.	Gyaku Tsuki with right foot forward - emphasis on pelvis work (hara)	30R x 4S		x	x				x	x				x			x		x		x
4.	Gyaku Tsuki with left foot forward - emphasis on pelvis work (hara)	30R x 4S		x	x				x	x				x			x		x		x
5.	Mawashi Geri with left foot forward - left foot kick - emphasis on pelvis work (hara)	20R x 4S				x	x				x	x	x		x				x		x
6.	Mawashi Geri with right foot forward - right foot kick - emphasis on pelvis work (hara)	20R x 4S				x	x				x	x	x		x				x		x
7.	Yoko Geri with left foot forward - left foot kick - emphasis on pelvis work (hara)	20R x 4S		x	x				x	x				x			x		x		x
8.	Yoko Geri with	20R x 4S		x	x				x	x				x			x		x		x



## 2. REVERSE PUNCH – GYAKU-TSUKI

*Interpretation of results, initial testing.* Measurements for the REVERSE PUNCH – GYAKU-TSUKI characteristic were performed on 10 subjects, in the initial testing. The arithmetic mean was 5.71.

## 3. ROUNDHOUSE KICK – MAWASHI-GERI

*Interpretation of results, initial testing.* Measurements for the ROUNDHOUSE KICK – MAWASHI-GERI characteristic were performed on 10 subjects, in the initial testing. The arithmetic mean was 8.88.

## 4. SIDEWAYS KICK – YOKO GERI

*Interpretation of results, initial testing.* Measurements for the SIDEWAYS KICK – YOKO-GERI characteristic were performed on 10 subjects, in the initial testing. The arithmetic mean was 7.46.

### Conclusions

On the one hand, the learning of karate-do by children, and on the other hand, the training consolidation and improvement by practitioners of all ages, require a carefully organized and planned preparation program, with a sound scientific basis materialized in highly accurate instruments and a strict preparation schedule, in order to achieve the intended performance, therefore to reach the proposed objectives. The content of sports preparation in karate-do must be directed towards all the preparation parameters, from the technical-tactical, physical, mental preparation to the theoretical-methodical preparation.

By means of the Quintic measurement system, we objectivized the efficiency of karate-do punches and kicks.

The program based on specific preparation means implemented by us has confirmed the hypothesis according to which it is important to objectivize training with modern means, adapted to the bio-psycho-socio-motor capacities.

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## CARDIOVASCULAR STATUS OF DISABLED CHILDREN AS A BENCHMARK FOR DESIGNING THE ADAPTED PHYSICAL PROGRAMS

Condiția cardio-vasculară a copiilor cu dizabilități reper în conceperea programelor fizice adaptate

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**Rezumat.** *Lucrarea prezintă un studiu preliminar care urmărește să stabilească modul în care parametri ai condiției cardio-vasculare precum tensiunea arterială, frecvența cardiacă și concentrația de oxigen din sânge, pot reprezenta repere în conceperea programelor de activități fizice adaptate. Cercetarea a cuprins persoane cu dizabilități care au fost supuse unor investigații privind condiția cardio-vasculară precum și unor teste pentru evidențierea nivelului fitness-ului. În urma evaluărilor au fost identificate disponibilitatea cardio-vasculară pentru efort și nivelul fitness-ului, aspecte care au stat la baza recomandărilor privind tipul de activități fizice adaptate și categoria de mijloace care se recomandă pentru fiecare profil în parte. Programele de exersare au fost adaptate vârstei și condițiilor de practicare la care au acces subiecții precum și bugetului de timp pe care aceștia îl pot acorda exercitiului fizic. Rezultatele studiului, constând în exemple de programe de activități fizice adaptate, vor susține acțiunile organizației Special Olympics Romania destinate copiilor cu dizabilități, precum și activitățile tuturor celor interesați de creșterea calității vieții acestei categorii de persoane.*

*Cuvinte cheie:* Condiție cardio-vasculară, persoane cu dizabilități, activități fizice adaptate.

**Abstract.** *This paper presents a preliminary study seeking to establish how the cardiovascular status parameters, like blood pressure, heart rate and blood oxygen level, can stand for benchmarks in designing the adapted physical activity programs. The research included impaired persons who were subjected to tests related to their cardiovascular status and tests designed to assess their fitness level. Following these tests, the cardiovascular availability for effort and the fitness level have been determined, these aspects substantiating the recommendations related to the type of adapted physical activities and the category of methods suggested for each profile. The exercising programs have been adapted to the age and practicing conditions accessible to the subjects, as well as to the time frame they are able to spare for the physical exercise. The study results, consisting of examples of adapted physical activity programs, will support the Special Olympics Romania organization's actions designed for disabled children, as well as the activities of all parties interested in increasing the quality of life of these persons.*

*Keywords:* cardiovascular status, intellectual disability, adapted physical activities.

### Introduction

The issue of development and social integration support for intellectually disabled persons represents, in the current European society's opinion, a major interest orientation of the policies and programs designed especially for this category of persons.

Among the measures considered to have efficient results on both these directions, the adapted physical education programs are particularly appreciated. Their valences in the recovery and improvement of functional, motor and psychic aspects seen in the intellectually disabled persons, as well as these persons' integration into social groups, are ensured by three types of programs (Teodorescu, Bota and Stănescu, 2003: 8-11; Sherrill, 2004:129):

- Physical exercise programs, using traditional methods adapted to the subjects' psycho-motor characteristics.
- Correctional programs, designed for rehabilitating postural deficiencies and biomechanical impairments.
- Programs for the development of motor qualities and the improvement of motor skill level.

Social reinsertion for young persons with special needs is efficiently achieved by adapted sports programs implemented on the following directions (Teodorescu, Bota and Stănescu, 2003; Vickerman, 2007):

- Programs for correcting the deficient physical stances.
- Programs for improving the movement capacity, fitness and social-emotional integration.
- Adapted sports programs, capitalizing the existing potential, in order to allow participation in competitions.

The Special Olympics Romania organization is carrying out adapted physical education and sports programs, including competitions and events designed to test the bio-motor level of intellectually disabled persons. These activities are currently reuniting about 27,000 persons who are enjoying the benefits of a high-level scientific and organizational support ensured by partnerships with the academic and public-private environment, concluded by the organization overtime (*Special Olympics Healthy Athletes*, 2012).

The *FUNfitness* event is part of the *Special Olympics Healthy Athletes®* international program designed to improve the health condition and physical status of Special Olympics athletes, having an effect on their sports

performances and social inclusion (*Special Olympics*, 2014; *National Evaluation of the Special Olympics Unified Sports Program*, 2001).

*FUNfitness*, implemented in Romania in September 2004, during the Special Olympics National Games, represents an event designed to test the motor capacity, being conducted by kinetotherapists assisted by students of the kinetotherapy faculties (*Special Olympics Healthy Athletes*, 2012).

The purpose of this program is to assess flexibility, functional strength, balance and physical shape of the Special Olympics athletes, based on test sets developed by the American Association of Kinetotherapists. At the same time, the program seeks to train athletes in order to improve their deficient functions, so that their capability to train and compete in the Special Olympics competitions increases (*National Evaluation of the Special Olympics Unified Sports Program*, 2001).

### Organization of the research

*Purpose.* This study represents a stage within a larger endeavour designed to establish a support framework for the specific training of Special Olympics athletes. By identifying the functional level of subjects, we are trying to establish matrix programs aimed to improve the cardiovascular endurance, as a universally valid support for sports performance.

*Subjects.* The tested sample included 57 subjects with ages between 9 and 40 years, with various levels of sports training. They participated in the tests established by *FUNfitness* and organized on 16.05.2013, in Bucharest.

*Methods.* In approaching the research endeavour, we used the following methods and tools:

- bibliographic study - to highlight the current level of knowledge and the significance of the researched topic;
- testing method - to assess the subjects (Epuran, 2005: 229);
- statistical method and statistical analysis using the SPSS 17 software - to process, analyse and interpret the obtained data (Labar, 2008).

### Description and development

The *FUNfitness* event, designed to assess the health condition and functional potential of subjects, consisted of an effort test represented by treading for 2 minutes. During testing, the following functional parameters were measured:

- blood pressure;
- heart rate;
- oxygen saturation level (% O<sub>2</sub>).

Heart rate and maximum oxygen level were measured in three different moments: prior to the effort test, after the effort test and 2 minutes after completion of the effort test. These three values and the afferent measurement times are seen as able to provide an objective image for the cardiovascular functionality of the subjects and for the level of effort capacity evaluated based on the recovery capacity observed after the test. The blood pressure parameter was measured once, prior to the effort test, for both arms of the subjects.

### Results of the test

The health level and cardiovascular capacity of the subjects are relevant through the values of blood pressure and heart rate at rest. The measurements of heart rate and oxygen level variation, taken under effort conditions, highlight the level of cardiovascular training of each subject.

The values obtained 2 minutes after completion of the test provide an image for the subjects' capacity of recovery after effort, a benchmark used to assess the level of training exhibited at that moment.

At the same time, the number of steps made by each subject during the 2-minute test represents an expression of the training level and, to some extent, the subject's capacity to remain focused on a task which is functionally and physically demanding. The performances seen in the effort test are also visibly influenced by the subject's intelligence quotient (IQ), an element which reflects the level of motor coordination and its maintenance.

By analysing the main trends of pulse at the three measurement moments, we can see for our 57 subjects that the medium pulse has increased from 85.33 during pre-exercise to 117.75 beats/ minute during post-exercise, while after 2 minutes it has decreased to 91.12 beats/ minute (Fig.1).

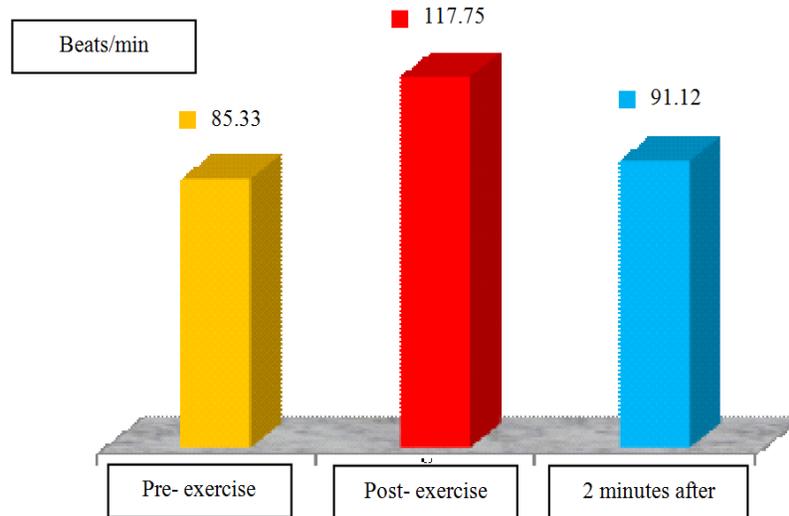


Fig. 1. Average values of the heart rate

The data are relatively homogeneously dispersed around the average and, during post-exercise period, the dispersion has increased by 1.25 times (Table 1).

Table 1. Descriptive statistics for the heart rate

PULSE	Mean %	Std. deviation	N	Coefficient of variation
Pre-exercise	85.33 29.00%	17.333	57	20.31%
Post-exercise	117.75 40.03%	30.013	57	25.49%
2 minutes after	91.12 30.97%	17.150	57	18.82%

The Pearson coefficients of correlation between the pulse values measured at the three moments have the same positive values and are significant at a p significance threshold (Sig. 2-tailed) of  $0.0001 < 0.05$ . We can see that the highest value of the correlation coefficient is 0.810 between the pre-exercise pulse and the pulse measured 2 minutes after the effort test end (Table 2).

Table 2. Correlations for the heart rate

PULSE	Pearson correlation	Heart rate (beats/ min)		
		Pre-exercise	Post-exercise	2 minutes after
Pre-exercise	R Sig. (2-tailed)	1		
Post-exercise	R Sig. (2-tailed)	<b>0.444**</b> 0.001	1	
2 minutes after	R Sig. (2-tailed)	<b>0.810**</b> 0.000	<b>0.525**</b> 0.000	1

The  $R^2$  determination index shows what percent of a variable dispersion is determined by the variable it is correlated with and, at the same time, represents an indicator for the effect amplitude showing, like R, the intensity of the relation between the two correlated variables. There is a medium to high effect between the pre-exercise and post-exercise pulse, a very high effect between the pre-exercise pulse and the pulse measured 2 minutes after the

effort test and a high effect between the post-exercise pulse and the pulse measured 2 minutes after the effort test end (Table 3).

Table 3. Coefficient of determination for the heart rate

PULSE	Coefficient of determination	Heart rate (beats/ min)		
		Pre-exercise	Post-exercise	2 minutes after
Pre-exercise	R <sup>2</sup>	1		
Post-exercise	R <sup>2</sup>	0.197	1	
2 minutes after	R <sup>2</sup>	0.656	0.276	1

These assertions are also supported by the graphs for pairs of values afferent to the pulse measured at the three relevant moments (Fig.2).

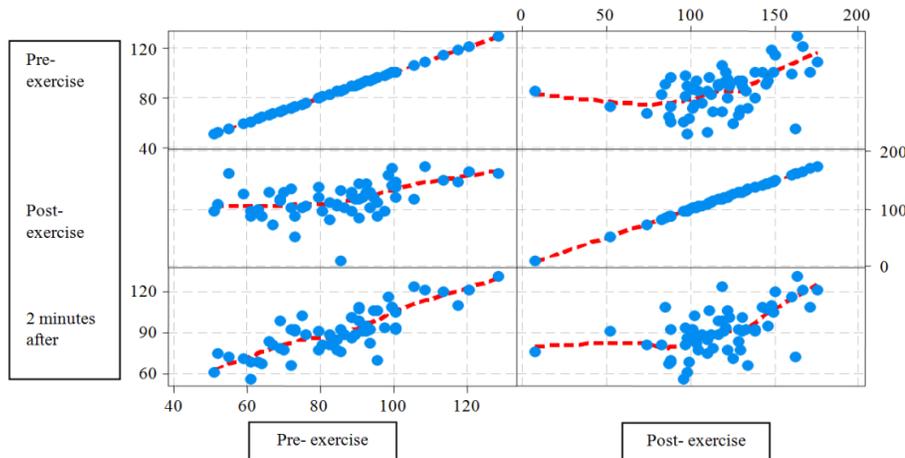


Fig.2.Pulse values

By analysing the data on oxygen saturation measured for the 57 subjects during testing, we can see that the medium oxygen saturation has decreased from 97.74% during pre-exercise to 95.70 % during post-exercise, while after 2 minutes it has increased to 97.95% (Fig.3).

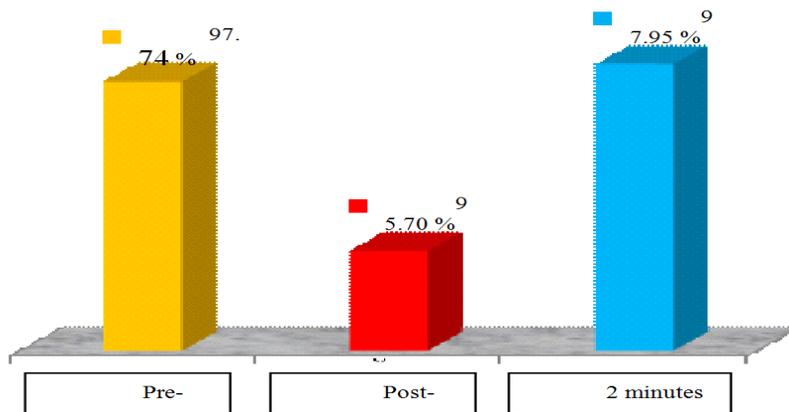


Fig. 3. Average values of oxygen saturation

The data are homogeneously dispersed around the average, and we can see that the dispersion has increased, post-exercise, by over 6 times (Table 4).

Table 4. Descriptive statistics for oxygen saturation

O <sub>2</sub> SATURATION	Mean	Std. deviation	N	Coefficient of variation
Pre-exercise	97.74	1.847	57	1.89%
Post-exercise	95.70	11.984	57	12.52%
2 minutes after	97.95	1.684	57	1.72%

The Pearson coefficients of correlation between the O<sub>2</sub>saturation values measured at the three relevant moments are not significant, the determined p signification thresholds (Sig. 2-tailed) exceeding 0.05. We can see that the highest value of the correlation coefficient is 0.146 between the O<sub>2</sub>saturation values during pre-exercise and post-exercise. The correlation coefficients have the same positive values, except for the coefficient of correlation between post-exercise and the coefficient measured 2 minutes after completion of the effort test, where the value is negative (Table 5).

Table 5. Correlations for oxygen saturation

O <sub>2</sub> SATURATION	Pearson Correlation	O <sub>2</sub> saturation (%)		
		Pre-exercise	Post-exercise	2 minutes after
Pre-exercise	R	1		
	Sig. (2-tailed)			
Post-exercise	R	0.146	1	
	Sig. (2-tailed)	0.277		
2 minutes after	R	0.007	-0.013	1
	Sig. (2-tailed)	0.959	0.922	

According to the computed R<sup>2</sup> determination coefficients, there is a low to medium effect between pre-exercise and post-exercise. In the other cases, the effect is lower (Table 6).

Table 6. Coefficient of determination for oxygen saturation

O <sub>2</sub> SATURATION	Coefficient determination	of	O <sub>2</sub> saturation (%)		
			Pre-exercise	Post-exercise	2 minutes after
Pre-exercise	R <sup>2</sup>	1			
Post-exercise	R <sup>2</sup>	0.02132	1		
2 minutes after	R <sup>2</sup>	0.00005	0.00017	1	

These assertions are also supported by the graphs for pairs of values afferent to the O<sub>2</sub>saturation measured at the three relevant moments (Fig.4).

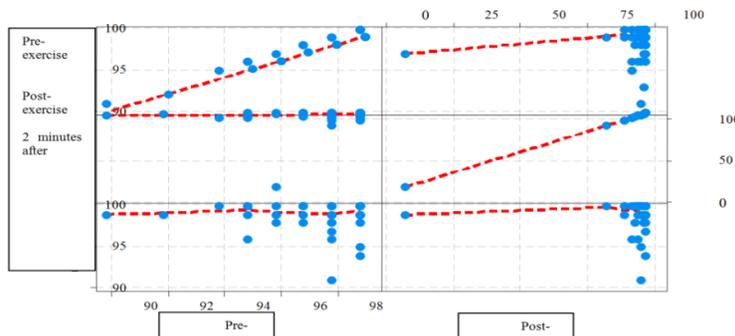


Fig. 4. Oxygen saturation values

## Conclusions

Improvement of biological status and social inclusion of intellectually disabled persons is currently a major interest direction of the policies and programs implemented in the European and international areas.

The correlation of values for blood pressure, heart rate and oxygen saturation level, measured under effort conditions, is a method of objectifying the biological response of subjects to the demands specific for sports activities.

The cardiovascular status of intellectually disabled subjects is a major benchmark in establishing the type of sports activity and the level of effort made during the said activity.

Highlighting the health condition and the level of cardiovascular apparatus functionality afferent to the Special Olympics athletes enables their effort capacity, which can be improved by programs adapted to each developmental stage.

Subjects' inclusion in adapted physical programs may improve the effort capacity of persons involved in the competitive activity, thus increasing their chances to obtain better results.

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## MANUAL COORDINATION IN WATER POLO PLAYERS – JUNIORS 14-15 YEARS OLD

Coordonarea manuală la jucătorii de polo pe apă – juniori 14-15 ani

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**Rezumat.** Cercetarea integrează metode de analiză și evaluare a capacității de coordonare și control a brațelor și mâinilor în activități de manipulare a obiectelor, care influențează direct sau indirect gradul de manevrabilitate a mingii/tehnica, având ca rezultat creșterea performanței sportive viitoare. Accentul se pune pe măsurarea dexterității manuale și a coordonării bilaterale la jucătorii de polo pe apă și pe studiul oportunității unei asemenea cercetări. Cercetarea cuprinde aplicarea bateriei de teste (Bruininks-Oseretsky Test of Motor Proficiency, Second Edition) la componenții a două cluburi de polo pe apă înscrise în Campionatul Național de juniori (Clubul Sportiv Școlar 3 Steaua și Colegiul Sportiv Emil Racoviță). Sportivii testați sunt născuți în anul 1997, joacă meci de meci la echipele de club și sunt în vizorul echipei naționale. Testarea s-a desfășurat în data de 07.08.2012 la sala de jocuri sportive a UNEFS București. În urma testării, am obținut următoarele rezultate: din 24 de sportivi testați, 83% (20 de sportivi) se încadrează în categoria medie, 9% (2 sportivi) se încadrează în categoria peste medie, 4% (1 sportiv) se încadrează în categoria sub medie și 4% (1 sportiv) se încadrează în categoria bine peste medie. Această cercetare a facilitat obținerea unor valoroase informații prin mijloace nespecifice (pe uscat), privind nivelul de coordonare manuală, necesare antrenorilor în vederea introducerii în pregătire a exercițiilor tehnice de manevrabilitate a mingii în condiții speciale (umiditate, adversitate, forța de pasare și primire, viteza, presiunea timpului, etc.), menite să îmbunătățească dexteritatea manuală și coordonarea membrilor superioare.

*Cuvinte-cheie:* coordonare manuală, polo pe apă, testul Bruininks-Oseretsky.

**Abstract.** The research integrates methods for analyzing and assessing the coordination and control capacity of arms and hands in activities related to object handling, which influences directly or indirectly the degree of ball handling /technique, resulting in an increase of the future sports performance. The emphasis is placed on measuring manual dexterity and bilateral coordination in water polo players and on studying the appropriateness of such a research. The research includes application of the test battery (Bruininks-Oseretsky Test of Motor Proficiency, Second Edition) to the members of two water polo clubs registered in the Junior National Championship (Steaua School Sports Club 3 and Emil Racovita Sports College). The tested athletes are born in 1997, play match by match at their club teams and are in the sights of the national team. Testing took place on 7 August 2012 in the sports hall of UNEFS Bucharest. After testing, the following results have been obtained: out of the 24 tested athletes, 83% (20 athletes) fall into the average category, 9% (2 athletes) fall into the above-average category, 4% (1 athlete) falls into the below-average category and 4% (1 athlete) falls into the well above-average category. This research has facilitated the obtaining of some valuable information through non-specific means (on land), regarding the manual coordination level, necessary for the coaches who intend to introduce in the preparation technical drills for the ball handling under special conditions (humidity, adversity, force to pass and receive, speed, time pressure, etc.), meant to improve manual dexterity and upper limb coordination.

*Keywords:* manual coordination, water polo, Bruininks-Oseretsky test.

### Introduction

Water polo game is among those sports where acyclic movements are predominant, with permanent changes in the motor dynamics and behavior (Pinnington *et al.*, 1988; Dopsaj and Matković, 1994; Smith, 1999, *quoted by* Bratusa, Perisic and Dopsaj, 2010: 245). Water polo is a sport with high energy consumption, spread through the actions of acceleration and the strong goal throws. Any type of technical action performed in the water, with the ball, involves inevitably manual coordination in the object handling, correlated to upper limb coordination, in order to ensure a good/efficient positioning of the water player's body. Ball passing and accurate hits are essential qualities that must be acquired during many training hours (Bompa and Carrera, 2006: 124). Water polo game does not simply mean swimming, but also a great number of other specific movements performed in the horizontal and vertical positions, namely technical elements with and without the ball, with and without an opponent, all these indicating the complexity of both the water polo game and the training itself, in relation to the technical and tactical preparation of the players (Snyder, 2008). The technique of water polo game represents a set of motor skills specific in their form and content, regarding the players' movement in the water and the ball handling, which develops according to the laws of higher nervous activity and of biomechanics, in order to achieve maximum effectiveness in the game (Marinescu, Frățilă and Bălan, 2004: 43).

*Research hypothesis.* Testing manual dexterity and upper limb coordination through non-specific means (on land) provides information about the aquatic sports performance of the young water polo players (junior III).

## Research methods

This paper represents an ascertaining pedagogic experiment, the research methods used being the following: testing method - Bruininks-Oseretsky Test Battery, Second Edition (BOT-2), graphical method, mathematical and statistical method with the statistical parameters of central tendency - arithmetic mean ( $\bar{X}$ ), statistical parameters of dispersion - standard deviation (S), coefficient of variability (CV) (Popa, 2008).

## Research design

*Period, location and subjects of the research.* The experiment subjected to testing 24 athletes, members of two water polo clubs in Bucharest, registered in the National Championship: Steaua School Sports Club 3 (1<sup>st</sup> place) and Emil Racovita Sports College (3<sup>rd</sup> place). The tested athletes are born in 1997, play match by match at their club teams and are in the sights of the national team. Testing took place on 7 August 2012 in the sports hall of UNEFS Bucharest.

*The test used.* The Bruininks-Oseretsky Test of Motor Proficiency, Second Edition (BOT-2), is a test battery which is administered individually, being based on a series of very well-defined objectives directed towards the assessment of a wide range of motor skills in subjects aged between 4 and 21 years. This battery was designed for kinetherapists, psychologists, physical education teachers, coaches and not only, providing them an efficient and reliable tool for measuring the fine and gross motor skills. Because during application of the test battery the subject is forced to use the preferred hand for achieving the different tasks, the subject's preference must be established before administering the test battery (Bruininks and Bruininks, 2005). Manual coordination (gross motricity) includes the arm and hand coordination in object handling activities.

### Description of subtests

*Subtest 1: Manual Dexterity.* Within this subtest, there are used activities requiring the upper limb coordination in situations related to handling some small-sized objects. The emphasis is placed on accuracy and the items are timed, therefore the subjects are asked to fulfill their tasks as fast as possible. Including the time factor, these activities differentiate more exactly certain dexterity levels. Speed and accuracy are also important for identifying some disorders, such as the developmental coordination disorder. Although the activities demanding manual dexterity are not among the everyday tasks, the skills necessary to fulfill them correspond to some daily activities, such as using the eating utensils, buttoning a suit, or to some recreational activities, such as sorting the books, constructing a puzzle.

*Subtest 2: Upper Limb Coordination.* This subtest consists of activities meant to assess the connection existing between visual coordination and that of the arm and hand movements. Tasks include catching, dribbling and throwing a tennis ball. Four items require the use of one single hand, while the other three need the use of both hands.

## Presentation, analysis and interpretation of results

Table 1. Results obtained at subtest 1 (Manual Dexterity)

Emil Racovita Sports Club				Steaua School Sports Club 3		
Item no.	Surname and name	Scaled score	Category description	Surname and name	Scaled score	Category description
1.	T.I.	11	Average	M.C.	14	Average
2.	N.D.	11	Average	C.M.	21	Above average
3.	J.A.	12	Average	C.G.	15	Average
4.	B.A.	23	Above average	C.D.	13	Average
5.	L.A.	17	Average	T.P.	14	Average
6.	C.D.	17	Average	I.R.	17	Average
7.	V.A.	14	Average	B.A.	21	Above average
8.	M.C.	16	Average	B.P.	18	Average

9.	I.F.	11	Average	M.I.	18	Average
10.	P.G.	11	Average	B.A.	20	Above average
11.	G.V.	12	Average	T.S.	18	Average
12.	Z.I.	14	Average	S.V.	23	Above average
<hr/>						
X		14.083		X		17.666
S		$\pm 3.654$		S		$\pm 3.200$
CV		25.95%		CV		18.115%

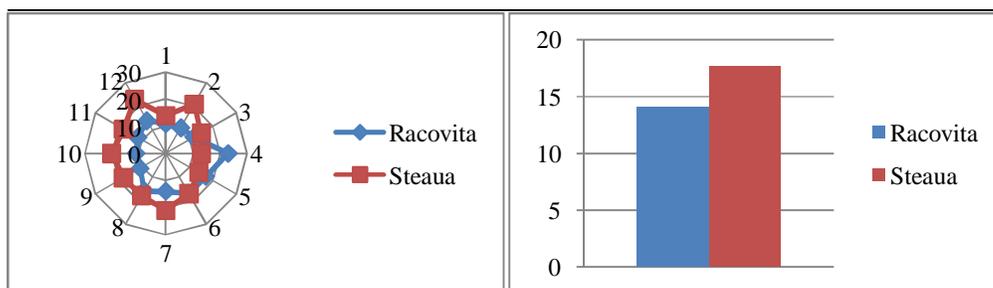


Fig 1. Dispersion of scaled scores

Fig 2. Averages of scaled scores

The average score obtained at the Manual Dexterity subtest is  $X = 14.083$  points for the Racovita athletes and  $X = 17.666$  points for those from Steaua. The difference between the two means is  $X = 3.583$  points in favor of the Steaua athletes, resulting thus that, at this subtest, the athletes belonging to Steaua Club have achieved a higher score (Table 1 and Fig. 2). Standard deviation is  $S = \pm 3.654$  points for the Racovita athletes and  $S = \pm 3.200$  points for those from Steaua. The difference is  $S = \pm 0.454$  points in favor of the Steaua athletes. The coefficient of variability,  $Cv = 25.95\%$  for the athletes from Racovita, shows that these ones form a non-homogeneous group, with a high dispersion of results. The coefficient of variability,  $Cv = 18.115\%$  for the athletes from Steaua, shows that these ones form a non-homogeneous group, with a high dispersion of results. The difference is  $Cv = 7.835\%$  in favor of the athletes from Steaua, which shows that the degree of dispersion of the results obtained by the Steaua athletes is lower in comparison with the results obtained by the Racovita athletes.

Table 2. Results obtained at subtest 2 (Upper Limb Coordination)

Emil Racovita Sports Club				Steaua School Sports Club 3		
Item no.	Surname and name	Scaled score	Category description	Surname and name	Scaled score	Category description
1.	T.I.	12	Average	M.C.	12	Average
2.	N.D.	21	Above average	C.M.	16	Average
3.	J.A.	21	Above average	C.G.	13	Average
4.	B.A.	21	Above average	C.D.	20	Above average
5.	L.A.	12	Average	T.P.	20	Above average
6.	C.D.	20	Above average	I.R.	20	Above average
7.	V.A.	16	Average	B.A.	16	Average
8.	M.C.	20	Above average	B.P.	20	Above average
9.	I.F.	13	Average	M.I.	16	Average
10.	P.G.	17	Average	B.A.	20	Above average
11.	G.V.	21	Above average	T.S.	20	Above average
12.	Z.I.	20	Above average	S.V.	17	Average
<hr/>						
X		17.833		X		17.5
S		$\pm 3.688$		S		$\pm 2.938$
CV		20.683%		CV		16.792%

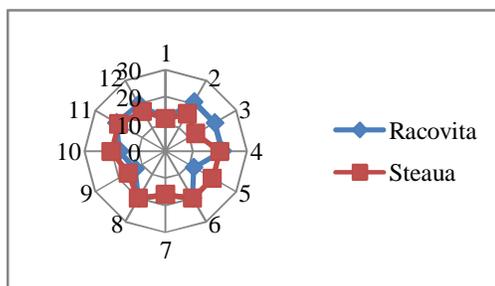


Fig 3. Dispersion of scaled scores

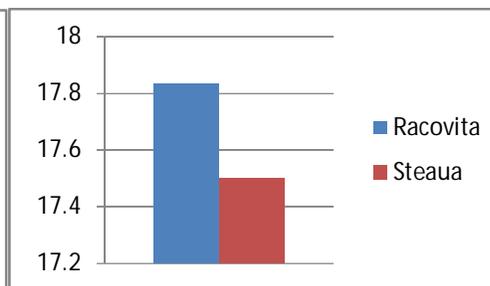


Fig 4. Averages of scaled scores

The average score obtained at the Upper Limb Coordination subtest is  $X = 17.833$  points for the Racovita athletes and  $X = 17.5$  points for those from Steaua. The difference between the two means is  $X = 0.333$  points in favor of the Racovita athletes, resulting thus that, at this subtest, the athletes belonging to Racovita Club have achieved a higher score (Table 2 and Fig. 4). Standard deviation is  $S = \pm 3.688$  points for the Racovita athletes and  $S = \pm 2.938$  points for those from Steaua. The difference is  $S = \pm 0.75$  points in favor of the Steaua athletes. The coefficient of variability,  $Cv = 20.683\%$  for the athletes from Racovita, shows that these ones form a non-homogeneous group, with a high dispersion of results. The coefficient of variability,  $Cv = 16.792\%$  for the athletes from Steaua, shows that these ones form a medium homogeneity group, with a medium dispersion of results. The difference is  $Cv = 3.891\%$  in favor of the athletes from Steaua, which shows that the degree of dispersion of the results obtained by the Steaua athletes is lower in comparison with the results obtained by the Racovita athletes.

Table 3. Results obtained for the Manual Coordination

Emil Racovita Sports Club				Steaua School Sports Club 3		
Item no.	Surname and name	Scaled score	Category description	Surname and name	Scaled score	Category description
1.	T.I.	38	Below average	M.C.	42	Average
2.	N.D.	51	Average	C.M.	57	Average
3.	J.A.	53	Average	C.G.	46	Average
4.	B.A.	72	Well above average	C.D.	52	Average
5.	L.A.	46	Average	T.P.	54	Average
6.	C.D.	57	Average	I.R.	57	Average
7.	V.A.	48	Average	B.A.	57	Average
8.	M.C.	56	Average	B.P.	59	Average
9.	I.F.	42	Average	M.I.	54	Average
10.	P.G.	46	Average	B.A.	62	Above average
11.	G.V.	53	Average	T.S.	59	Average
12.	Z.I.	54	Average	S.V.	61	Above average
X		51.333		X	55	
S		$\pm 8.669$		S	$\pm 5.954$	
CV		16.888%		CV	10.83%	

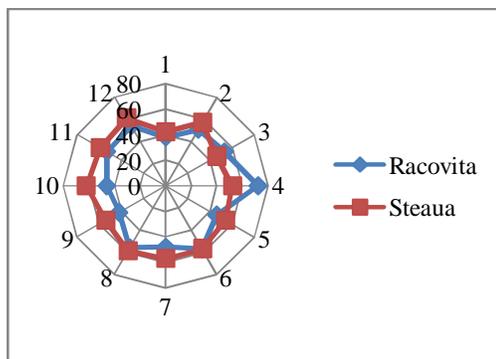


Fig 5. Dispersion of standard scores

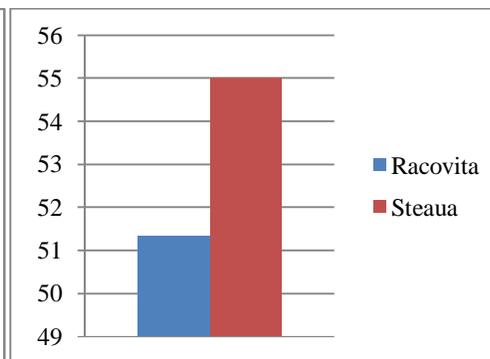


Fig 6. Averages of standard scores

The average score obtained at the Manual Coordination test is  $X = 51.333$  points for the Racovita athletes and  $X = 55$  points for those from Steaua. The difference between the two means is  $X = 3.667$  points in favor of the Steaua athletes, resulting thus that, at this test, the athletes belonging to Steaua Club have achieved a higher score (Table 3 and Fig 6). Standard deviation is  $S = \pm 8.669$  points for the Racovita athletes and  $S = \pm 5.954$  points for those from Steaua. The difference is  $S = \pm 2.715$  points in favor of the Racovita athletes. The coefficient of variability,  $Cv = 16.888\%$  for the athletes from Racovita, shows that these ones form a medium homogeneity group, with a medium dispersion of results. The coefficient of variability,  $Cv = 10.83\%$  for the athletes from Steaua, shows that these ones form a medium homogeneity group, with a medium dispersion of results. The difference is  $Cv = 6.058\%$  in favor of the athletes from Steaua, which shows that the degree of dispersion of the results obtained by the Steaua athletes is lower in comparison with the results obtained by the Racovita athletes.

## Conclusions

General and specific physical preparation on land is particularly important to children and juniors, for increasing the water-specific motor acquisitions.

Analyzing the data collected within the experiment, we can assert that it is imperative to implement in the training sessions the means related to ball handling on dry land, in order to obtain a positive transfer in the specific environment (the water).

Although the research results show that the players fall into the average category as regards the gross manual coordination, we are suggesting that more emphasis should be placed, in the training sessions both on land and in the water setting, on the ball handling under conditions specific to the game dynamics, in order to position the players into the above-average category, in the case of this item.

The psychomotricity gained through the non-specific preparation on land realizes a positive transfer towards the specific preparation in the water, improving the motor skills and abilities.

Testing manual dexterity and upper limb coordination through non-specific means (on dry land) provides information about the aquatic sports performance of the young water polo players (junior III) – *the hypothesis is confirmed*.

Results achieved in the championship by the athletes belonging to Steaua School Sports Club 3 versus the athletes belonging to Emil Racovita Sports College corroborate with the results obtained after applying the Bruininks-Oseretsky Test Battery, Second Edition (BOT-2).

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## STUDY REGARDING THE EFFECT OF USING HEAVY BAG AND WEIGHT ANKLE IN LOWER LIMB TAEKWONDO TRAINING

Studiu privind efectul utilizării sacului și greutăților pentru gleznă în antrenamentul de Taekwondo

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**Rezumat.** Sacul și greutatea pentru gleznă, în cadrul antrenamentelor sportivilor practicanți de taekwondo, sunt unele dintre cele mai comune instrumente folosite. Dar practicarea greșită a tehnicilor în timpul pregătirii, utilizarea abuzivă a sacului și a greutății pentru gleznă, conduc la un număr crescut de leziuni. În acest studiu, am analizat efectul folosirii lor în antrenamentele de taekwondo, pentru bărbați și femei, luând în considerare greutatea sportivilor și culoarea centurii.

*Cuvinte cheie:* leziuni în taekwondo, membre inferioare.

**Abstract.** Heavy bag and weight ankle, for taekwondo training, are some of the most common instruments used by the practicing athletes. But the wrong techniques and training methods, the misuse of the heavy bag and weight ankle lead to an increased number of injuries. In this study, we analyzed the effect of using heavy bag and weight ankle in taekwondo training, for male and female, considering weight and color belt.

*Key words:* taekwondo injuries, lower limbs.

### Introduction

The most common taekwondo injuries are caused by improper practice or poor training skills. Taekwondo demands the use of the entire body, especially the hands and the feet (Kil, 2006). Injuries occur both during the training and competition, lower limb injuries being among the most common. In case of the ankle, powerful repetitive kicks with the foot's instep is one of the primary causes for the joint injuries – joint hyperextension and the impact of the heel bone against the lower leg bone (Amsell, 1990).

In a study conducted on a sample of 50 athletes from the Korean taekwondo national team, Kyung *et al.* (2009) examined the incidence of extensor hallucis longus tendon injury in taekwondo athletes while performing hyperplantarflexed barefoot kicking exercises. As a result, they found out that EHL thickness of the experimental group ( $1.52 \pm 0.16$  mm) was greater and the control group ( $1.46 \pm 0.11$  mm) ( $p < 0.01$ ). In conclusion, Taekwondo athletes have a higher incidence of changes on sonographic imaging of the EHL compared to non-taekwondo participating healthy subjects.

In another study over the Turkish national taekwondo team, published in the European Journal of Experimental Biology in 2013, Alparslan Ünveren aimed to prevent the injuries by analyzing the injuries state and their causes. Based on the answers the author got for the questioner, he found out that 94,87% of the athletes stated that they were injured, most of the injuries consisted of "Strain" by 37,85%, the injuries in games mostly consisted of "Crush" by 29,73%; the most frequently injured areas of the national team athletes in trainings were Foot-Ankle by 51,4% and in games were Foot-Ankle by 59,45%; the reasons for injuries in trainings according to the athletes' answers were insufficient warm-up by 51,28% and overloading by 17,95%, whereas in games according to the athletes' answers were illegal action of the opponent by 33,33%, insufficient warm-up by 15,38%.

### Study Methodology

The current study adopted the descriptive approach involving collecting data in order to show the effect of using heavy bag and weight ankle in lower limb taekwondo training.

*Question of the Study.* What is the level of effect of using heavy bag and weight ankle in lower limb taekwondo training?

*Study Hypothesis.* **H<sub>01</sub>:** There are no Significant Differences in level of effect for using heavy bag and weight ankle in lower limb taekwondo training due to gender. **H<sub>02</sub>:** There are no Significant Differences level of effect for using heavy bag and weight ankle in lower limb taekwondo training due to Weight and Belt Color.

*Study Population and Sample.* To increase credibility, it is important to choose the sample that will represent the population under investigation. The population of the study consists of 20 Taekwondo Players in Palestine.

*Demographic Variables.* Table 1 shows the demographic variables of the study sample (Gender, Wight, Belt Color).

Table 1. *Descriptive sample of the demographic variables of the study*

No	Variables	Categorization	Frequency	Percent
1	Gender	Male	12	60.0
		Female	8	40.0
		Total	20	100%
2	Wight	60- less	6	30.0
		61-70 Kg	6	30.0
		71-80 Kg	6	30.0
		80 - more	2	10.0
		Total	20	100%
3	Belt Color	Yellow	2	10.0
		Red	5	50.0
		Brown	10	25.0
		Black	3	15.0
		Total	20	100%

### Study Tools and Data Collection

The current study consists of two aspects, theoretical and practical. In the theoretical aspect, we relied on the scientific studies. Whereas in the practical aspect, we relied on descriptive and analytical methods using the practical manner to collect, analyze data and test hypotheses. The data collection, manners of analysis and programs we used are based on a questionnaire that we have designed to reflect the study objectives and questions.

Tabel 2. *Questionnaire Statements*

No.	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	The effect on the spine					
2	Ankle fracture					
3	Muscle Weakness					
4	Numbness of the lower limbs					
5	Fatigue					
6	Muscle strain					
7	Weaken the ligaments around the knee					

The questionnaire instrumental sections are as follows:

*Section One:* Demographic variables. The demographic information was collected with closed-ended questions, through 3 factors (Gender, Wight, Belt Color).

*Section Two:* Study Regarding the effect of using heavy bag and weight ankle in lower limb taekwondo training on a Likert-type scale as follows:

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
5	4	3	2	1

*Statistic Treatment.* The data collected from the responses of the study questionnaire were used through Statistical Package for Social Sciences (SPSS). Finally, we used the suitable statistical methods that consist of: percentage and frequency; Cronbach Alpha reliability ( $\alpha$ ) to measure strength of the correlation and coherence between questionnaire items; arithmetic mean to identify the level of response of study sample individuals to the study variables; standard deviation to measure the responses spacing degree about arithmetic mean; T-test and One

Way ANOVA test used; the low degree from 1 – 2.33; the medium degree from 2.34 – 3.67; the high degree from 3.68 and above.

#### *Validity and Reliability*

*Validation.* To test the questionnaire for clarity and to provide a coherent research questionnaire, a macro review that covers all the research constructs was thoroughly performed by Expert academic reviewers in the Sport Major. *Study Tool Reliability.* To calculate the stability of an instrument study, we used the equation of internal consistency using test Cronbach's alpha of Cronbach alpha for all Statements of the study and identification of generally higher (60%) which is acceptable in the research and studies and gives the questionnaire as a whole the reliability coefficient ranged between (73.1-72.5.8%).

#### **Results analysis**

According to the purpose of the research and the research framework presented in the previous part, we describe the results of the statistical analysis for the data collected according to the research questions and research hypotheses. The data analysis includes a description of the Means and Standard Deviations for the questions of the study.

*Descriptive Analysis of Study Variables.* What is the level of effect of using heavy bag and weight ankle in lower limb taekwondo training. We used the arithmetic mean, standard deviation, item importance and importance level as shown in table 3.

Table 3. Arithmetic Mean, SD, Item level of effect of using heavy bag and weight ankle in lower limb taekwondo training

No	Statements (Reason)	Mean	Std. Deviation	Item Importance	Importance Level
2	Ankle fracture	4.21	0.21	1	High
7	Weaken the ligaments around the knee	4.06	0.23	2	High
3	Muscle Weakness	4.05	0.24	3	High
4	Numbness of the lower limbs	4.01	0.30	4	High
6	Muscle strain	3.65	0.75	5	Medium
1	The effect on the spine	3.50	0.77	6	Medium
5	Fatigue	3.14	0.79	7	Medium
Total		3.80	0.47		High

From Table 3 the mean of this axis (effect of using heavy bag and weight ankle in lower limb taekwondo training), ranged between (4.21 – 3.14), where the whole axis earned a total mean of (3.80), which is a level of high. Paragraph (2) (Ankle Fracture) earned the highest mean reaching (4.21), with standard deviation (0.21), which is a level of High, and paragraph (7) (Weaken the ligaments around the knee) came in the second place with mean reaching (4.06) and standard deviation (0.23) which is a level of High, and third place came paragraph (3) with mean reaching (4.05) with standard deviation (0.24) and its in the High Level. Paragraph (5) (Fatigue) came last in place. It earned a mean of (3.14), and a standard deviation (0.79), which is a level of Medium (see fig. 1).

*This shows that the effect of using heavy bag and weight ankle in lower limb taekwondo training was in the High level.*

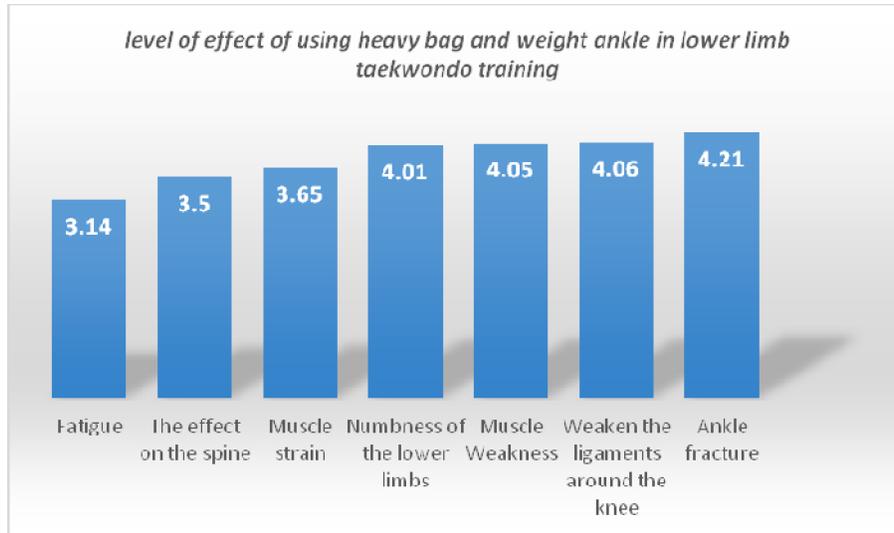


Fig. 1. Level of effect for using heavy bag and weight ankle in lower limb taekwondo training

*H0<sub>1</sub>: There are no Significant Differences in level of effect of using heavy bag and weight ankle in lower limb taekwondo training due to gender*

Table 4. Independent Sample T-test to show the level of effect of using heavy bag and weight ankle in lower limb taekwondo training due to gender

Source	Gender	No.	Mean	Std. Deviation	T Tabulated	T Calculated	DF.	Sig
effect of using heavy bag and weight ankle in lower limb taekwondo training	Male	12	3.51	0.74	1.96	3.241	18	0.00*
	Female	8	4.05	0.21				

\*significant at level ( $\alpha \geq 0.05$ )

Table 4 show that there are significant differences in the effect of using heavy bag and weight ankle in lower limb taekwondo training due to gender, mean for male was (3.51) and mean for female was (4.05), T calculated value was (3.241) and its more than T tabulated, This explained that females are affected by using the heavy bag and ankle weight in the lower limb more than males in taekwondo training, and figure (2) shows that:

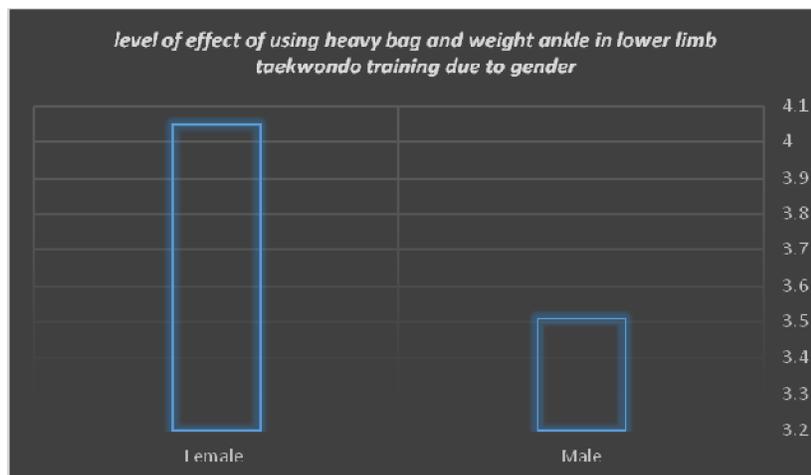


Fig 2.Level of effect for using heavy bag and weight ankle in lower limb taekwondo training due to gender

$H_{02}$  : There is no Significant Differences level of effect of using heavy bag and weight ankle in lower limb taekwondo training due to Weight and Belt Color

1- Weight of the Player

Table 5. One Way ANOVA test to show the level of effect of using heavy bag and weight ankle in lower limb taekwondo training due to weight

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.678	3	2.893	62.520	*.000
Within Groups	3.516	16	.046		
Total	12.194	19			

\*significant at level ( $\alpha \geq 0.05$ )

Table 5 shows that there are significant differences in the effect of using heavy bag and weight ankle in lower limb taekwondo training due to weight of player, (F) value was (62.250) and its significant at (0.05) level, the differences favor to weight (60) and less.

2- Belt Color for the Player

Table 6. One Way ANOVA test to show the level of effect of using heavy bag and weight ankle in lower limb taekwondo training due to Belt color for the Player

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.555	3	0.676	.318	.841
Within Groups	1.541	16	.002		
Total	4.096	19			

\*significant at level ( $\alpha \geq 0.05$ )

Table 6 shows that there are no significant differences in the effect of using heavy bag and weight ankle in lower limb taekwondo training due to belt color for the player (F) value was (0.318) and it's not significant at (0.05) level.

## Discussion and conclusions

The main results are: the effect of using heavy bag and weight ankle in lower limb taekwondo training was on ankle fracture (4.21), weaken the ligaments around the knee, muscle weakness, numbness of the lower limbs. The importance of effect was in the high level about this points.

There were significant differences in level of effect of using heavy bag and weight ankle in lower limb taekwondo training due to gender and the variance was in favor for female (4.05).

There were significant differences level of effect of using heavy bag and weight ankle in lower limb taekwondo training due to weight of the player and the differences was in favor for those who weight (60) and less and there is no significant differences level of effect of using heavy bag and weight ankle in lower limb taekwondo training due to belt color.

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## PRIMARY UMBILICAL ENDOMETRIOSIS IN A PATIENT WITH NO SURGICAL HISTORY. A CASE STUDY

Endometrioza ombilicală primară la o pacientă fără istoric chirurgical. Studiu de caz

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**Rezumat:** Deși endometrioza este o patologie frecvent întâlnită în sfera ginecologică, localizarea extră uterină și extra gonadală a acesteia este mai rar întâlnită, deseori asociată cu intervenții chirurgicale care favorizează diseminarea. Nodulul Villard sau endometrioza primară ombilicală este o entitate chirurgicală foarte rară, manifestată clinic prin sângerări ombilicale concorde cu perioadele menstruale ale pacientei. Studiul de față prezintă cazul unei paciente de 23 ani, cu patologie ombilicală complexă - fistula de uraca, hernie ombilicală și endometrioză cutanată. Dat fiind incidența foarte rară a acestei patologii, considerăm oportun a prezenta și discuta managementul diagnostic și terapeutic al cazului:

*Cuvinte cheie:* endometrioza cutanată primară, nodul villard, hernie ombilicală;

**Abstract.** Although endometriosis is a frequent disease within gynecological domain, its extra uterine and extra-gonadal location is less common, often associated with surgery that promotes dissemination. Villard nodule or primary umbilical endometriosis is a rare surgical entity, clinically manifested through the umbilical bleeding consistent with the patient's menstrual periods. The study presents the case of a patient of 23 years, with umbilical complex pathology - fistula abomination, umbilical hernia and cutaneous endometriosis. Given the rare incidence of this pathology, we consider it appropriate to present and discuss the diagnosis and therapeutic management of the case.

*Keywords:* Primary cutaneous endometriosis, Villard node, umbilical hernia;

### Introducere

Endometriosis (the presence of endometrial-like tissue outside the uterus) is a chronic disease associated with pelvic pain and subfertility. Prevalence rates in the general population are unknown, because a definitive diagnosis is established only at laparoscopy. However, based on community prevalence estimates of symptoms, endometriosis probably affects 10% of all and 30%–50% of symptomatic premenopausal women. This represents ~176 million affected women worldwide (Nnoaham *et al.*, 2011).

Endometriosis is the presence of hormonally responsive endometrial tissue located elsewhere than in the uterus. It is a frequently pathology observed, asymptomatic or, most commonly associated with infertility, dysmenorrhea or chronic pelvic pain (Lu and Ory, 1995). The causes of the disease are still uncertain, there are several theories that can not yet explain its association with infertility: Retrograde menstruation, celomical metaplasia, immune depletion, stem cells action or various genetic causes (Nnoaham *et al.*, 2011).

Endometriosis is a pathology with many management and diagnostic difficulties. The first to describe and study "the perforated cysts of the ovary" was Sampson, in 1921, estimating a 10% incidence in the population (Sampson, 1921). However, the Villard nodule has been described since 1886, despite being extremely rare, with an incidence of 0.5-0.1% of all cases of extra genital endometriosis. (Panicker, Pilla and Nagarsekar, 2010).

Endometriosis is most commonly associated with cutaneous postsurgical incisions. Iliac fossa pathology is masked by dyspareunia, diemenoree, hernia injuries cellulite and the diagnosis is thus much delayed (Agarwal and Fong, 2008).

Umbilical endometriosis can be primary or secondary to surgery. The most common clinical manifestation is umbilical, bleeding, brown or purple skin nodule (Victory, Diamond and Johns, 2007). The differential diagnosis includes melanomas, Sister Mary Joseph nodule, paraneoplastic syndrome, granulomas (Năcul and Spritzer, 2010). Therapeutically we recommend complete surgical resection and cure lesions associated (Fancellu, Pinna and Manca, 2013). According to Malebranche and Bush (2010), patients with cutaneous endometriosis typically present to the gynecologist and the dermatologist. If they have a history of pelvic or abdominal surgery, then they can also present to the general surgeon. There have been only 81 published reports of 'umbilical endometriosis' in the world between 1953 and 2008. Although patients with umbilical endometriosis infrequently present to the plastic surgeon, we present such a case and suggest that it be kept on the plastic surgeon's differential diagnosis for umbilical lesions (Fig. 1).



Fig. 1. Umbilical endometriosis preoperatively (*apud* Malebranche and Bush, 2010)

### Case presentation

The patient aged 23 years came to surgery clinic 2 Colentina Hospital, Bucharest, reducible to pseudotumor formation, umbilical, painful, fluid umbilical extravasation. The patient was nulliparous and has not undergone any surgery in history. Occasionally she presented episodes of dysmenorrhea, without any clinical or pathological changes personal history, family history material.

Clinically it was detected uncomplicated umbilical hernia, fistula formation abomination and with cutaneous nodular upper pole cord diameter about 1 / 0.8 / 0.5 cm. The area was discreetly painful on palpation. The patient reported no bleeding episodes or through the umbilical local changes associated with menstrual periods. Laboratory findings showed no pathological laboratory changes on EKG, chest X-ray and abdominal ultrasound. For this reason surgery was performed with spinal anesthesia and surgical resection of skin formation, anatomical umbilical hernia and fistula surgical abomination cure.

Postoperatively the patient had a favorable evolution with discharge in 24 hours. Histopathological outcome highlighted the following aspects: fragment of skin deep dermis presenting endometrial-like glands; overlying skin with moderate acanthosis and minimal hiperorokeratoza. Cutaneous Endometriosis.

### Discussion and conclusions

As shown by the literature, umbilical endometriosis has no definite cause, but primary causes are considered - marrow or lymphatic sowing distance or association with abomination fistulas; or secondary - post-incisional insemination for laparoscopic interventions trocar or interventions used in cesarean median (Weng and Yang, 2011) neglected or recurrent malignant has as a risk the malignisation (Efremidou *et al.*, 2012).

For the preoperative diagnosis when skin endometriosis is suspected can make a series of dermoscopy tests, with anti CD10, verification of proliferative phase (Esteves, Cabrita and Coelho, 2010), screening of tumor markers as 125, or combination of imaging techniques such as ultrasound and MRI. For the preoperative diagnosis of the case presented clinical examination of the patient was performed, thus medical history revealed periods of local bleeding and laboratory tests. Laboratory tests, EKG, chest radiography and the patient's ventilatory samples did not show any change. Ultrasound soft tissue of this certificated an umbilical hernia formations pseudo- skin tumor without deep implantation.

The faction appearance, color, location, local presence and a thorough history of bleeding were enough to introduce the differential diagnosis of melanoma, endometrial cutaneous nodule. The histopathological description includes glandular tissue with similar cellular and vascular component free endometrial stroma. The dermatological studies attempt to introduce dermoscopy in routine diagnosis of cutaneous endometriosis, even describing a particular aspect of small globular structures, named "red atolls" (De Giorgi *et al.* 2003).

The differential diagnosis of the umbilical surgical pathologies should take into account the Villar nodule, especially in young fertile adulthood. The complete surgical excision party, the complete cure pathologies associated to associated (umbilical hernias, fistulas URAC, post laparoscopy eventrations) ensures a complete cure without recurrence of cutaneous endometriosis. The postoperative evolution was favorable for the case presented, with discharge in 24 hours from surgery , the wound healing and returning to control after 14 days without locoregional complications, the wound completely healed.

Golden cutaneous endometriosis diagnosis remains the standard histopathological examination. Usually a simple analysis with hematoxylin is enough, but if there are elements of nonendometrial adjacent tissue fibrosis

then it may be used for the immunohistochemical differentiation testing. Endometriosis significantly affects women and societies world-wide, but substantial delays in diagnosis exist. Heightened awareness of the disease in primary care should lead to earlier diagnosis, less suffering, and improved work productivity. Future research should address the underlying pain mechanisms in endometriosis and identify symptom control strategies that target those pathways to improve the outlook for affected women (Nnoaham *et al.*, 2011).

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## A COMPARATIVE ANALYSIS OF THE DIFFERENCES BETWEEN THE ARITHMETICAL MEANS RECORDED BY THE EXPERIMENTAL AND CONTROL GROUPS AND THE ROMANIAN TENNIS FEDERATION STANDARDS FOR THE SPECIFIC MOTOR CHALLENGES

Analiza comparativă a diferențelor dintre mediile aritmetice obținute de grupele de experiment și control și baremul fir la probele motrice specifice

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**Rezumat.** Prin metoda de antrenament Tennis 10 jocul de tenis este învățat prin joc - Game Based Approach (abordare bazată pe joc). Această abordare modernă a stârnit interesul mai multor studii de specialitate fiind interesate în special de jocurile ce ajută la dezvoltarea aptitudinilor psihomotrice dar și a însușirii deprinderilor motrice specifice jocului de tenis. În această lucrare ne-am propus să subliniem importanța aplicării acestei metode de antrenament la nivelul copiilor și să realizăm analiza comparativă a diferențelor dintre Baremul FRT și probele motrice specifice la cele două grupe (de experiment și de control).

*Cuvinte cheie: analiza comparativă, barem FRT, probe motrice specifice*

**Abstract.** By using the Tennis 10 method, the game is learned through playing - the Game Based Approach. This modern approach has gained the interest of many experts, a lot of them being interested especially in the games that help develop the psycho-motor skills, but also in the learning of the specific tennis skills. This paper aims to highlight the importance of this method when applied to children, and to conduct a comparative analysis between the Romanian Tennis Federation (RTF) standards and the specific motor challenges applied to the two groups (experimental and control).

*Key words: comparative analysis, RTF standard, specific motor challenges*

### Introduction

The professional literature presents various opinions in regards to the name and definition of an individual's way of performing coordinated, precise movements, with a certain strength, speed, endurance, etc. The authors alternatively use the terms motor capacity/motor skill/physical skill etc. Thus, Zaïorski describes "physical skills", while N.Alexe, P.Hilerin, "bio-motor skills."

Ardelean (1981) considers them to be "essential properties of muscle activity expressed through motor actions, conditioned by the functional structure and capacity of various systems of the human body, but mediated also by the mental processes and capacity." The Tennis 10 coaching method is:

- a three-stage version of tennis;
- initially designed for children, but used today also for adults;
- a structured way of using slower balls, smaller courts and smaller racquets;
- adequate to age and size.
- Tennis 10 helps children play tennis faster and feel more confident while they do it, because:
- players learn and play faster;
- coaches teach the children the actual game, and not isolated techniques;
- players are motivated not to give up the game, being capable of playing and making progress.

The aim of this research is to highlight the impact of the Tennis 10 method on the development of motor skills in children. For this study, the following objectives have been set:

- the improvement of the children's motor skills by applying the Tennis 10 method;
- highlighting the effectiveness of the Tennis 10 method for children's training.

The study tried to verify the hypothesis stating that the use of the Tennis 10 method determines a motor development level in the children that is closer to the RTF standards than the use of the classical method.

### Materials and Methods

The research subjects, aged between 7 and 9, were 56 children (31 boys and 25 girls) and were selected in 2013 from various Bacău schools. They were divided in two groups equal in number: experimental and control.

The applicative intervention for the experimental group was conducted at the "Ion Creanga" School, while the one for the control group, at the "Nicolae Vasilescu Karpen" Technical College of Bacău, starting with the 2nd

of October 2013, over the course of 8 months. The training lessons were conducted 2 times a week, with one hour for each lesson. The children in the control group were trained by head coach Ciuntea Mihai Octavian, while the ones in the experimental group, by coach Ciuntea Mihai Lucian. The research was conducted between the 1st of October 2013 and the 28th of May 2014 in the gymnasium of the "Ion Creanga" school, as follows:

- 01 - 15 of September 2013 the application of the questionnaire;
- 16 - 15 of September 2013 the initial tests were conducted;
- 21 - 15 of September 2013 the applicative intervention was conceived;
- 02 of October 2013 - 28 of May 2014 applying the applicative intervention to the two groups: experimental and control;
- 28 of May - 31 of May 2014 the final tests;
- 01 of June - 20 of August 2014 data analysis;
- 20 of August - 30 of October 2014 final draft of the paper.

*The system of the training means* - the experimental group subjects performed exercises using slow balls, racquets and courts that were adequate to their age. The game-based approach was used, meaning the subjects learned to serve and hit the tennis ball since their first lesson. The control group subjects performed exercises using normal balls and racquets, and courts that were inadequate for their age. The ball hitting technique was emphasized.

## Results and Discussions

Comparative analysis of the differences between the arithmetical means recorded by the experimental and control groups and the RTF standards for the specific motor challenges

Table 1. *Differences between the arithmetical means recorded by the experimental and control groups and the RTF standards*

Challenge	Difference between arithmetical mean and RTF standard -		Difference between arithmetical mean and RTF standard -	
	GIRLS 12&U		BOYS 12&U	
	Experimental	Control	Experimental	Control
Fan-shape	3.3096	4.4907	4.3096	5.4907
Side step	0.2443	0.3357	0.6443	0.7357

Regarding the fan-shape challenge, one can see that in the case of the experimental group there is a difference of 3.3096 in girls and of 4.3096 in boys, compared to the RTF standard, higher than in the case of the control group, 4.4907 in girls and 5.4907 in boys, meaning that the experimental group recorded a better progress than the control group for this challenge.

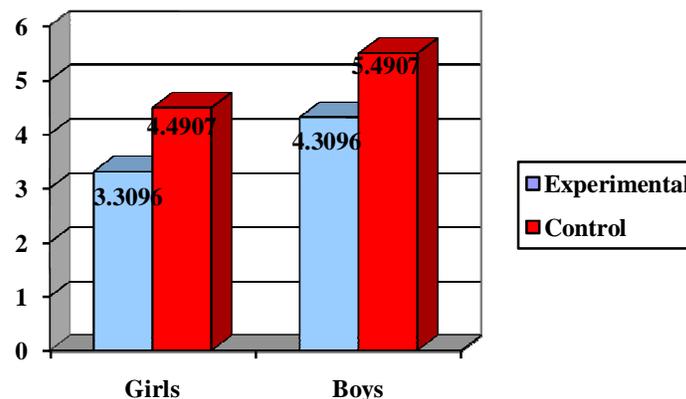


Fig. 1. Differences between the experimental and the control groups, compared to the RTF standard for the fan-shape challenge.

Regarding the side step challenge, one can see that in the case of the experimental group there is a difference of 0.2443 in girls and of 0.6443 in boys, compared to the RTF standard, lower than in the case of the control group, 0.3357 in girls and 0.7357 in boys, meaning that the experimental group recorded a better progress than the control group for this challenge.

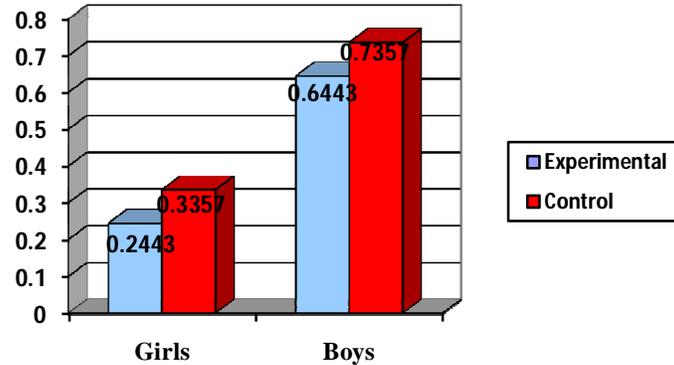


Fig. 2. Differences between the experimental and the control groups, compared to the RTF standard for the side step challenge

### Conclusions

At the end of this paper that tried to emphasize the impact of using the Tennis 10 method when elaborating training programs, the following conclusions were drawn: the experimental study confirmed the hypothesis stating that the use of the Tennis 10 method determines a motor development level in the children that is closer to the RTF standards than the use of the classical method; the results of this experimental study and their analysis indicate the fact that the motor development level of beginner children is below the RTF standards. As a result of the statistical-mathematical analysis, using the t-test for dependent variables, one can say that within the experimental and control groups, the differences between the final and initial phase are statistically significant, the groups being homogeneous.

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## RESEARCH ON THE IMPORTANCE OF IMPLEMENTING KRAV MAGA IN THE POLICE TRAINING

Cercetare privind importanța implementării Krav-Maga în pregătirea polițiștilor

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**Rezumat:** Datorită influențelor sale pozitive și a eficienței acestuia, sistemul Krav Maga are toate șansele să devină cât de curând cel mai folosit mijloc de pregătire în lecția de autoapărare a studenților din Academia de Poliție. Totodată, există posibilitatea extinderii lui și în programul de pregătire a cadrelor, pornind de la obligativitatea acestora de a se pregăti continuu atât în ceea ce privește cunoștințele de autoapărare, cât și în ceea ce privește calitățile motrice de bază și capacitățile coordinative.

*Cuvinte cheie:* Krav Maga, tehnici, polițiști, situații de luptă, autoapărare, chestionar, ancheta.

**Abstract:** Due to its efficacy and positive influences, the Krav Maga system has all the chances to become – as soon as possible - the most used training technique in the self-defense course given to students in the Police Academy. In addition, there is the possibility to extend it in the training program for the teaching staff, starting from their commitment to have continuing preparation in the self-defense area, but also to improve their basic motric qualities and the coordinative abilities.

*Keywords:* Krav Maga, techniques, cops, combat, situations, self-defence, questionnaire survey.

### Introduction

Krav Maga is a simple aggressive self defense system (Levine and Whitman, 2007) which has its fundament more on several different outlines and less on the number of techniques. This self defense method is not a traditional martial art. Krav Maga is a self defense system that belongs to the Israeli, and it is known worldwide as a modern and practical self defense system, recognized more as a self defense art than a martial art.

In the present research we have conducted a survey following an inquiry based on a questionnaire, conducted both among students and among specialists in the system. This work has highlighted a number of issues, which helped to outline a solid standpoint in terms of need for a project-based program fighting techniques of Krav Maga and its implementation in specific training of students as well as M.I.A. staff. The need for new and original knowledge is a starting point in achieving this objective (Gagea, 2000), considering that it is the first time being surveyed in the Police Academy A. I. Cuza.

### Research structure

*The objectives of the preliminary research.* Preliminary research aimed to investigate and objectify the attitude of students and specialists in physical education from M.I.A. towards Krav Maga techniques and the opportunity of implementing them in the curricula of the Police Academy, and also in training programs of M.I.A. teaching staff (Levine and Whitman, 2007).

*Aim.* The aim of our preliminary research is to show the knowledge gaps regarding Krav Maga self defense technique among students of “Alexandru Ioan Cuza” Police Academy and M.I.A. specialists in physical education and sports, anticipating their desire to learn and to be trained in this fighting technique.

*Hypothesis.* It is assumed that the staff of the Ministry of Internal Affairs (students / professionals officers) do not have enough knowledge of the Krav Maga self defense system, which is an obstacle in training officers for public order and safety structures.

*Subjects and place.* We applied the questionnaire on a category of subjects, such as: 200 Police Academy students and 40 specialist officers from M.I.A. The answers to our questionnaire were grouped and they reflect opinions on accessibility, efficiency, and the need to implement the Krav Maga specific self defense training of police officers.

The present survey was preceded by the following instruction: in order to implement the techniques of Krav Maga in the curricula of the Police Academy, and in training programs for M.I.A. teaching staff, please be kind enough to respond honestly to the following items.

## Methods

The present questionnaire contains 12 items, and for a better accuracy it is formed as well from closed and open questions. This questionnaire was applied on a sample formed by 200 students from the Police Academy, and as well 40 specialists in self defense from M.I.A. This survey is meant to emphasize the importance of Krav Maga self defense in Police Academy special training, especially in self-control, tactics, and physical training. Also, this research presents the actual level of training of the Police Academy students and specialists in this method of savvy.

This research was preliminary inquiry, part of a much extensive project, and it was applied in the period 1-30 May 2014 under a strict surveillance for a better accuracy of the data.

## Research stages

In conducting this research we undertook the following steps:

- Phase I - prior to the survey we determined the object of the inquiry, documented on its development, established hypotheses, objectives and tasks of the inquiry, we determined the sample on which the questionnaire was to be applied ;
- Phase II - in which we have chosen our work tools, we have established written questions and the means of applying the questionnaire;
- Stage III - in which we applied the questionnaire;
- Phase IV - we processed the information obtained from the questionnaire ;
- Phase V - we performed the analysis and interpretation of results and conclusions were made.

## Content and interpretation of the questionnaire

Q1. Do you think it is useful to research, in order to optimize the level of self-defense training of the future police officers, by adapting the Krav Maga techniques? The answers of those two categories of subjects have been differentiated, as follows (table 1 and Fig. 1):

Table 1. *The subjects' answers concerning the usefulness of the research*

Answers	Yes	No
Research subjects	%	%
Students	73	27
Specialist officers from the Ministry of Internal Affairs	95	5

A total of 38 specialists from the Ministry of Internal Affairs (95%) and 146 students (73%) answered that a research in order to improve the self-defense training of the future police officers, by adapting the Krav Maga techniques is useful.

Q2. Do you think that in the Police Academy there are conditions for implementing the Krav Maga in the physical education programs?

Table 2. *The subjects' answers concerning the resources for implementing the Krav Maga system in the physical education programs*

Answers	Yes	No
Research subjects	%	%
Students	92	8
Specialist officers from the Ministry of Internal Affairs	90	10

The subjects' answers to this item are differentiated according to the category to which they belong. The two groups of subjects agreed, in a large percentage, to the existence of resources for implementing the Krav Maga techniques in physical education programs of the Police Academy as it is presented in Table 2.

Our opinion in this respect is that due to the complexity and special requirements of this sport, the Krav Maga techniques can be placed in the specialized curriculum, with the condition that the physical education lessons to gain this specific training allure of this Israeli self-defense system, which is the basic condition for achieving the effective self-defense behaviors through the Krav Maga techniques.

Q3. Do you know the contents of the technical-tactical system of Krav Maga?

Table 3. *The subjects' answers concerning the technical-tactical contents of Krav Maga*

Answers	Yes, I know them very well	Yes, but not very well	Very little	Not at all
Research subjects	%	%	%	%
Students	5	7	22	66
Specialist officers from the Ministry of Internal Affairs	20	30	40	10

Although in our country the self-defense disciplines are well known, the tactical and technical contents and requirements in learning and practicing the Krav Maga techniques are known only by a very small number of people as it is presented in Table 3. If specialist officers from the Ministry of Internal Affairs know in a higher percentage the content of these techniques, a very small number of students do not know this.

Q4. To what extent do you think that the technical-tactical actions of the Krav Maga can be adapted to the self-defense specific to police officers?

Table 4. *The subjects' answers concerning the adaptation of Krav Maga actions to the police officers' self-defense*

Answers	A very large extent	A large extent	A small extent	They are not appropriate
Research subjects	%	%	%	%
Students	21	44	26	9
Specialist officers from the Ministry of Internal Affairs	25	50	20	5

With respect to this item, it can be observed that the two categories of subjects queried through the questionnaire survey state that the Krav Maga techniques can be adapted to the self-defense behavior (Table 4)

Q5. Do you consider necessary to introduce a number of lessons with themes from Krav Maga in the physical education activity in the Police Academy

Table 5. *The subjects' answers concerning the necessity to introduce a number of lessons with themes from Krav Maga*

Answers	Yes	No
Research subjects	%	%
Students	73	27
Specialist officers from the Ministry of Internal Affairs	85	15

The subjects' answers to this item had approximately the same orientation, with some differences from one category to another. The majority of specialists in physical education from the Ministry of Internal Affairs think that a number of lessons with themes from Krav Maga should be inserted, and 73% of students surveyed consider the same (Table 5).

Q6. How do you assess that the range of study (initiation and training) of Krav Maga techniques should be at the students' level during studies?

Table 6. *The subjects' answers concerning the range of study (initiation and training) of Krav Maga techniques at the students' level during*

Answers	One year	Two years	Three years
Research subjects	%	%	%
Students	20	30	50
Specialist officers from the Ministry of Internal Affairs	0	20	80

Q7. Do you think that it would be appropriate to establish a Krav Maga group at the Police Academy's level?

Table 7. *The subjects' answers concerning the appropriateness to establish a Krav Maga group at the Police Academy's level*

Answers	Yes	No
Research subjects	%	%
Students	75	25
Specialist officers from the Ministry of Internal Affairs	85	15

The subjects' answers expressed their "openness" towards the appropriateness of establishing a Krav Maga group at the level of the department of physical education of the Police Academy. (Table 7)

Q8. Do you think that it would be necessary to implement a self-defense program with techniques from Krav Maga also at the level of the operational structures from the Ministry of Internal Affairs?

Table 8. *The subjects' answers concerning the implementation of a self-defense program with techniques from Krav Maga also at the level of the operational structures from the Ministry of Internal Affairs*

Answers	Yes	No
Research subjects	%	%
Students	70	30
Specialist officers from the Ministry of Internal Affairs	90	10

The answers to this item show us that a percentage of 90% of the interviewed officers and 70% of students considered necessary to implement a Krav Maga program in the self-defense training of the operational structures from the Ministry of Internal Affairs. (Table 8)

Q9. In which of the operational structures from the Ministry of Internal Affairs do you think that applying a higher percentage of the Krav Maga techniques would be more appropriate?

Table 9. *The subjects' answers concerning the application in a higher percentage of the Krav Maga techniques*

Answers	Public Order	Mili Poli Forc	Special Tro
Research subjects	%	%	%
Students	65	25	10
Specialist officers from the Ministry of Internal Affairs	50	25	25

Overall, the responses show the clear option on the desirability of using the Krav Maga self-defense system in the structures of public order. (Table 9)

Q10. In the future are you going to pay more attention to the training with the Krav Maga self-defense techniques?

Table 10. *The subjects' answer concerning the use of the Krav Maga techniques in the future*

Answers	Yes	No
Research subjects	%	%
Students	65	35
Specialist officers from the Ministry of Internal Affairs	90	10

Using the Krav Maga techniques in perspective is of a greater concern for specialist officers in physical education from the Ministry of Internal Affairs, while 65% of students see their usefulness in the specific training for self-defense. (Table 10)

Q11. Do you think an implementation of Krav Maga techniques is necessary in other military structures: Protection and Guard Service, the Ministry of National Defence, the Romanian Intelligence Service?

Table 11. *The subjects' answers concerning the implementation of Krav Maga techniques in other military structures*

Answers	Yes	No
Research subjects	%	%
Students	75	25
Specialist officers from the Ministry of Internal Affairs	90	10

Regarding this question, specialist officers from the Ministry of Internal Affairs agree in a large percentage (90%) with the use of these techniques in preparing other military structures in our country. A percentage of 75% of students see the utility of using these techniques in other military structures. (Table 11)

Q12. Do you consider necessary an exchange of experience at the level of the European military schools that have implemented in their curriculum the Krav Maga?

Table 12. *The subjects' answers concerning the necessity of an exchange experience with the police schools in Europe*

Answers	Yes	No
Research subjects	%	%
Students	95	5
Specialist officers from the Ministry of Internal Affairs	100	0

The exchange experience at the level of military schools in Europe is fully supported by specialist officers of the Ministry of Internal Affairs and by the students of the "Alexandru Ioan Cuza" Police Academy.

Specialist officers agree 100% on the exchange of experience with other police schools, thus, in our opinion, bringing a big plus in the correct principles of learning this system in an efficient way and with great popularity in many other countries. (Table 12)

## Conclusions

As a result of applying of the questionnaire and of the interpretation of the answers of those interviewed, we have gathered a number of conclusions. As a result of applying the questionnaire, it was found that the public order and safety system does not possess a significant knowledge about the fighting Krav Maga technique. The desire to master the different means of defiance and to learn technical combinations not easily found is extremely high among specialist officers in the Ministry of Internal Affairs. About 95% of them have shown interest in this new style of fighting and, therefore, find useful a research which has in mind the optimization of the level of self-defense training. A pretty close rank was observed at the students across this study, 73% of them considering this step necessary.

The degree of knowledge of this fighting style is quite low, especially among students. This is somehow explainable by the fact that this style of fighting is not a notoriety across our country. His limited character is created by and for the Israeli – which makes it less accessible to specialists in the field of combat sports.

Insufficient knowledge of this fighting style causes one-third of the students and officers questioned to not appreciate the degree of adaptation of Krav Maga techniques to the specific self-defense elements of the police. The number of those who believe that the Krav Maga techniques can be adapted to the specific self-defense elements is pretty big, which is a positive thing.

The percentage of those who expressed the agreement to learn this new fighting style underlines once more the importance of conducting this scientific study. The experience of learning the elements of the specific self-defense elements has determined the subjects to consider that a period of three years is most beneficial to accumulate in a sound and effective manner the Krav Maga techniques.

Mastering the techniques at the highest level of performance cannot be achieved only through the lessons of physical education. The best practitioners have made additional workouts in order to perfect their technique, and to develop their own style. This is why a very large number of those interviewed considered necessary to establish a Krav Maga course. The operative structures are those which directly face with everything that means the disturbing of peace and public order. This is why, at this level, the knowledge of the most effective means of combating all forms of disturbing the civic order or the threat to the safety of citizens is essential. At this level, the intervention must be energetic and efficient, and also smooth.

Errors in this situation can have very serious consequences. Cases requiring the intervention of the forces of order are different, which is why the structures that act at a given time can be either of the police, the military specials forces or of the special troops (Gagea, 2000). It's hard to make a difference between these structures. Each can be applied to an action with a high degree of social danger and that is why the presence of Krav Maga techniques is equally important to any of the three structures.

Between the subordinate structures of the Ministry of Internal Affairs and the subject of other institutions of the system of public order and safety, such as the Protection and Guard Service, the Ministry of National Defence, the Romanian Intelligence Service existed, exists and will exist a good cooperation. For this reason and the fact that, at some point, there may be major operations, in which all those structures to be deployed, it is understood that the majority of those questioned responded affirmative, with regard to the implementation of the Krav Maga techniques in these structures. The introduction of the exchange experience has been a good opportunity for mutual enrichment, accumulations of checked-in baggage of knowledge. Cooperation at an European level between the various educational establishments of the system of public order, was a committed way with regard to training programs, in order to carry out joint missions.

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## STUDY IN CONNECTION WITH THE LEVEL OF THE MOBILITY AT THE THREE DOWN'S SYNDROME CHILDREN

Studiu cu privire la nivelul de dezvoltare a mobilității la trei copii cu sindrom Down

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**Rezumat.** Acest articol este elaborat și publicat sub egida Universității Naționale de Educație Fizică și Sport din București, ca partener în programul co-finanțat de Fondul Social European prin Programul Operațional Sectorial pentru Dezvoltarea Resurselor Umane 2007-2013, dezvoltat prin proiectul Pluri- și interdisciplinaritate în programe doctorale și postdoctorale, Cod proiect: POSDRU/159/1.5/S/141086, al cărui principal beneficiar este Institutul de Cercetare a Calității Vieții, Academia Română. În acest studiu, prezentăm rezultatele obținute de subiecții noștri (doi băieți și o fată, în etate de 13 ani) la testele de mobilitate ale bateriei Brockport - mobilitatea coloanei vertebrale, mobilitatea la nivelul centurii scapulohumerale, mobilitatea articulației coxofemorale. Rezultatele obținute la testarea inițială și intermediară au fost comparate cu datele prezentate de V. Șuță (2010) care a aplicat aceleași teste pe subiecți cu retard mental de aceeași vârstă. În final, am observat că o parte din rezultatele subiecților noștri la testarea inițială au fost mai bune decât cele ale lui V. Șuță (2010), iar o parte inferioare. La testarea intermediară, subiecții noștri au obținut rezultate superioare celor realizate la testarea inițială.

*Cuvinte cheie:* copii cu sindrom Down, mobilitate, teste, testare inițială și intermediară;

**Abstract.** The study is a part of a project which is achieved and published under the aegis of the National University of Physical Education and Sports of Bucharest, as a partner of the programme co-funded by the European Social Fund within the Operational Sectorial Programme for Human Resources Development 2007-2013 through the project Pluri- and interdisciplinary in doctoral and post-doctoral programmes Project Code: POSDRU/159/1.5/S/141086, its main beneficiary being the Research Institute for Quality of Life, Romanian Academy. In this study, we present the results obtained by our subjects (two boys and a girl, aged 13) at the mobility tests of the Brockport Battery - the extension of the trunk test, shoulder stretch test and back-saver sit and reach test. We compare the data obtained by our sportsmen at the initial and intermediary testings with the results obtained by V. Șuță (2010) when he applied the same tests on the mentally disabled children who had the same age. We analyzed and discussed all the data. We can conclude that our subjects' initial results are better or lower than the results obtained by V. Șuță (2010). At the intermediary testing our subjects improve their performances in comparison with the others realized at the initial testing.

*Keywords:* Down's syndrome children, mobility, tests, initial and intermediary testing;

### Introduction

Mobility is one of the components of the motor capacity at which the Down's syndrome children do not present a shortage. Even more, they present a hypermobility at the level of the joints (Teodorescu et al., 2007 and Curat, 2015). This can and has to be corrected with the help of practicing physical exercises (Dragnea and Bota, 1999, Dragnea and Mate-Teodorescu, 2002, Șerbănoiu, 2004). It is important that disabled children have a normal level of mobility because it determines the characteristics and the parameters of the movements. At the same time, mobility is permitted to carry out the motor skills very correctly and efficiently.

A low level of mobility determines the increase of the time period in which the motor skills are learnt, the increase of the possibility to appearing an injury, a negative influences to the other components of the fitness, a.o.

We must not forget that the children with Down's syndrome have a low level of the muscle force which influences the execution technique of the movements too.

The means perform for improving of mobility have to be preceded by a very good warm up which addresses all the muscle groups. Teodorescu et al. (2007) recommend 3 series of the exercises for developing the level of mobility. Every exercise can have 5-10 repetitions. A repetition can be maintained for 6-12 seconds. The series of the exercises should be performed 3-5 days a week.

In this paper we want to underline the manner in which our subjects (three children with Down's syndrome) improve their mobility at the level of the spine, shoulder and hip joints. We mention that we practised land exercises with our subjects because this is the manner in which the mobility is developed for swimming. The effects are observed in time, but a good level of mobility determines the reduction of the energy consumption, the delay of the fatigue which help the subject to perform a movement more fluently.

### Materials and methods

*Subjects.* Three Down's syndrome children were involved in our study (S1, S2 and S3). S1 and S3 were boys and S2 was a girl. They were 13. The subjects had two testings. First of them (the initial testing) was realized in

July, 2014 and the latter (the intermediary testing) was performed in January, 2015. We mention that these testings would be completed with another one (the final testing) in July, 2015. All of them are parts of a post PhD project which has proposed to underline the advantages of swimming practice by the Down's syndrome children.

*Methods.* Our subjects were evaluated with the help of the Brockport battery. The three Down's syndrome children were tested using the all items of this battery, but in this paper we paid attention only to the mobility tests. In these conditions, the mobility tests were:

- the extension of the trunk test – the test evaluated both the trunk and cervical spine extension, strength of the muscles which realized that movement and flexibility. The subjects were laid on a “mat in a prone position (face down). Toes were pointed, and hands were placed under the thighs” (Winnick and Short, 1999). The subject had to lift the “upper body off the floor to a maximum height of 30cm” (Winnick and Short, 1999). The position had to be kept “long enough to allow the tester to measurement the distance from the participant's chin to the floor” (Winnick and Short, 1999). The final result was noticed in centimetre;

- the shoulder stretch test – it determined whether the subject “was able to touch the fingertips together behind the back by reaching over the shoulder and down the back with one arm and across the back with the other arm” (Winnick and Short, 1999). Thus, the test evaluated the upper-body mobility. We evaluated both arms with the help of a centimetre and expressed our subjects' performances in centimetre. We mentioned that Şuță (2010) presented only a result for shoulder stretch test. He did not indicate which part of the body was evaluated.

- the back-saver sit and reach test or the box test (Şuță, 2010) – the test measured the spine and hip mobility. The subject had to sit with one leg “fully extended with the foot flat against the end of the testing” (Winnick and Short, 1999) device. The other knee “was bent, with the sole of the foot flat on the floor 5 to 8 centimetre to the side of the straight knee” (Winnick and Short, 1999). The arms were forward, with their hands one above the other. The subject had to bend the trunk forward, touch the measurement scale and keep the new position for more than a second. “After measuring one side, the subject switched the position of the legs and reached again” (Winnick and Short, 1999). The final results were noticed in centimetre. We applied the test for both legs. We mentioned that Şuță (2010) presented only a result for back-saver sit and reach test. He did not indicate which part of the body was evaluated.

The data that we obtained were compared with the mathematical average of the results obtained by Şuță (2010) when he applied the same tests on the mentally disabled children with the same aged too. We took into consideration both groups that Şuță (2010) evaluated, but only the performance obtained at the initial testing. The first group had a low level of the motor capacity. The second group had a high level of the motor capacity.

We mentioned that we realised these comparisons because we wanted to know the mobility level of our Down's syndrome subjects at the beginning of our research and if it developed after six months from when we taught them to swim and repeated with them specific and non-specific means of swimming.

## Results

After applying the two testings of the tests mentioned before, we reached these results:

a) *the extension of the trunk test* – the results were presented in the table 1 and figure 1:

Table 1. *The extension of the trunk test*

	Initial testing	Intermediary testing
S1	24cm	28cm
S2	0cm	22cm
S3	25cm	30cm
The mathematical average of the results obtained by Şuță (2010) – the group with the low level of the motor capacity	25,2cm	
The mathematical average of the results obtained by Şuță (2010) – the group with the high level of the motor capacity	28,38cm	

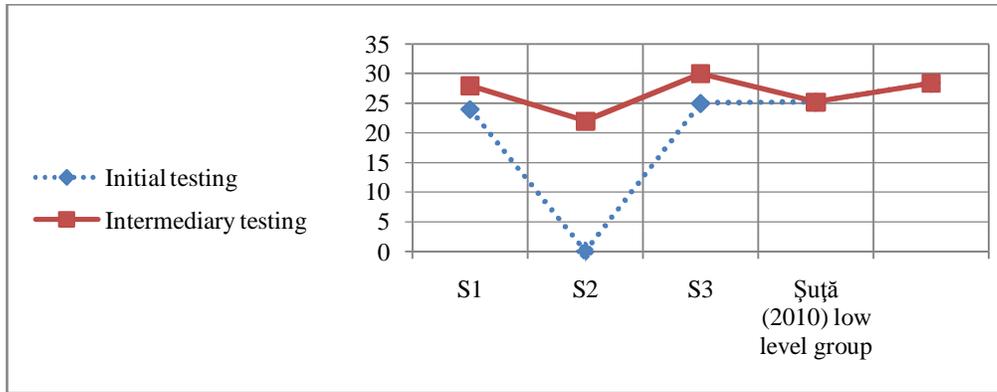


Fig. 1. The extension of the trunk test

After we analysed the results (table 1 and figure 1), we would were able to say that:

- our subjects had a lower performance at the initial testing than of Șuță's groups (2010);
- S1 obtained at the initial testing lower data than the Șuță's groups. At the intermediary evaluation he improved his result. It was 2,8cm higher than the first group and the same performance as the second group;
- S2 could not perform the test at the initial testing. She could not keep the extension position so that we could not measure her trunk extension. In this condition, her performance was 0cm. At the intermediary testing, she could keep the extension position and her performance was 22cm. That result was lower than S1 and S2 data, but better than the initial testing;
- S3 had a lower result than the second groups at the initial testing. He improved his result and bettered both groups at the intermediary testing (4,8cm, respectively 1,62cm).

b) *the shoulder stretch test*– the results were presented in the table 2 and figure 2:

Table 2. *The shoulder stretch test*

	Initial testing		Intermediary testing	
	Right shoulder joint	Left shoulder joint	Right shoulder joint	Left shoulder joint
S1	2cm	2cm	4cm	5cm
S2	-2cm	2cm	0cm	3cm
S3	0cm	3cm	5cm	7cm
The mathematical average of the results obtained by Șuță (2010) – the group with the low level of the motor capacity	0,3 cm			
The mathematical average of the results obtained by Șuță (2010) – the group with the high level of the motor capacity	0,5cm			

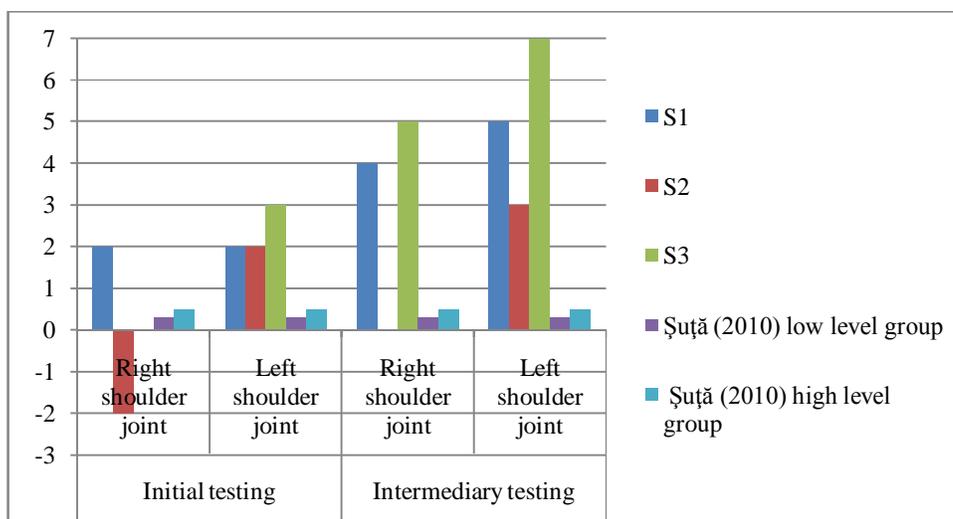


Fig. 2. The shoulder stretch test

After we analysed the results (table 2 and figure 2), we were able to say that:

- the performances of our subjects were higher than both groups tested by Șuță (2010);
- all our subjects improved their results from the initial testing to intermediary testing;
- S1 improved his results by 2cm for the right shoulder joint and by 3cm for the left shoulder joint;
- S2 had a negative value for the right shoulder joint initially, but she realized a positive performance at the second evaluation. The performance for the left shoulder joint is better at the second evaluation by 3cm than the first measurement;
- the third subject improved his performances more than the other two Down's syndrome children in our study. He had better results by 5cm for the right shoulder joint and by 4cm for the left shoulder joint.

c) *the back-saver sit and reach test or the box test*– the results were presented in the table 3 and figure 3:

Table 3. *The back-saver sit and reach test or the box test*

	Initial testing		Intermediary testing	
	Right hip joint	Left hip joint	Right hip joint	Left hip joint
S1	4cm	6cm	4cm	4cm
S2	3cm	2cm	10cm	6cm
S3	5cm	3cm	9cm	7cm
The mathematical average of the results obtained by Șuță (2010) – the group with the low level of the motor capacity	24,2 cm			
The mathematical average of the results obtained by Șuță (2010) – the group with the high level of the motor capacity	18,50cm			

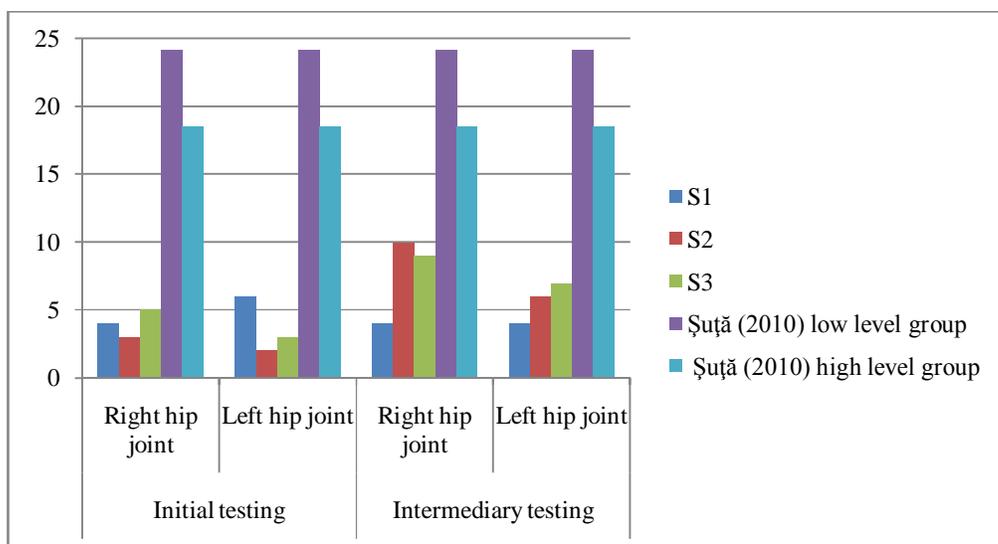


Fig. 3. The back-saver sit and reach test or the box test

After we analysed the results (table 3 and figure 3), we were able to say that:

- the performances of our subjects were much lower than both groups tested by Şuță (2010);
- S1 has a lower performance for the left leg at the intermediary testing than the initial testing. But we thought that he did not pay a lot of attention during the test, his performances having the same result as initial testing too;
- S2 and S3 improved their results from one test to another for both legs.

### Discussions and conclusions

Mobility is a component of motor capacity which can be developed or maintained if a person wants and works this. The children with Down's syndrome have a good level of mobility which permits them to perform a lot of movements with large amplitude. This influences in a positive manner the technique of the sport disciplines that they practise.

Our subjects improve their results obtained for all evaluated tests. They have the better results at the initial testings than the results obtained by Şuță (2010) for the shoulder stretch test. The lower results are for the extension of the trunk test and the back-saver sit and reach test. At the intermediary testing, we can observe that our subjects improved their performances for the extension of the trunk test and the shoulder stretch test. But their results are lower at the back-saver sit and reach test in comparison with the Şuță's groups which we use for analogy.

We found out less international researches which presented the data in connection with the level of the mobility at the children with Down syndrome (13 aged). But, the study realised by T.I.M. Hilgenkampa et al. (2014) claimed that the Down's syndrome persons presented a lot of medical problems because of their "lower levels of multiple physical fitness components". If we compare our subjects' results, we can claim that they obtained better performances at the intermediary testing. This aspect is normal because they have practised specific exercises addressed for mobility improving during the six months (period of time between the initial testing and intermediary testing).

### Acknowledgements

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## THE TACTICAL PROFILE OF TOP PERFORMANCE ATHLETES IN KARATE DO

Profilul tactic al sportivilor de elită în karate do

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**Rezumat.** Karate do contribuie permanent la dezvoltarea individului, fiind o ușă deschisă spre limite ce urmează a fi depășite, iar plenitudinea acestei arte rezidă din comuniunea spirit-psihic-corp! Lucrarea de față reprezintă un punct de pornire într-un studiu legat de profilul tactic al sportivilor, care poate constitui un factor predictiv al performanțelor sportivilor din karate do în competiții. Astfel, lucrarea urmărește realizarea profilului tactic al sportivilor de karate do, considerat de noi fiind important pentru dirijarea pregătirii și creșterea nivelului de performanță. Un combatant cu rezultate înalte în karate do este un sportiv ajuns pe trepte superioare de măiestrie sportivă care are la bază o tehnică individuală, o concepție de luptă și un ritm de desfășurare al luptei distinct, propriu. De asemenea, karateka este un sportiv complex, care folosește atât stilul de luptă ofensiv, cât și cel defensiv, în funcție de adversarul său, având astfel un stil de luptă combinat, reușind să-și desfășoare întregul arsenal tehnico-tactic prin atacuri rapide urmate de apărări și contraatacuri surprinzătoare, toate cât mai eficiente și irațional coordonate în vederea obținerii victoriei în luptă.

*Cuvinte cheie:* karate do, profil tactic, performanță

**Abstract.** Karate do permanently contributes to the individual's development, being an open door towards limits that are to be exceeded and the plenitude of this art resides in the spirit-psyhic-body communion! The present paper is a starting point for a study focused on the athletes' tactical profile, which may represent a prediction factor for the competitive performances of karate do fighters. Thus, our paper aimed to construct the karate do athletes' tactical profile, considered by us to be important for managing their preparation and increasing their performance level. A competitor with top results in karate do is an athlete who has reached higher levels of sports mastery, who possesses an individual technique, has his own conception about fighting and also his own distinct fighting rhythm. Also, the karate do athlete is a complex athlete who uses both the offensive and defensive fighting styles, depending on his opponent, by having thus a combined fighting style that enables him to display his entire technical-tactical arsenal through quick attacks followed by surprising defenses and counter-attacks, all of them as efficiently and rationally coordinated as possible, in order to win the victory in the competitive fight.

*Keywords:* karate do, tactical profile, performance

### INTRODUCTION

Specialists have expressed many opinions about the importance of practicing karate do. In this context, Deliu (2008: 121) considers karate do as an art that presents a maximum efficiency under the aesthetics and elegance conditions and that supposes technical perfection. In his turn, Frederic (1993: 7) considers martial arts as a universe in itself, a captivating one, which couldn't be discovered in its whole complexity not even if man had been given to live many lives one after another!

In addition to an art of unarmed combat, karate is practiced as a sport and high performance, the karateka are specialists in upper and lower limbs kicks, blocks, dodge, attack and defensive movements, etc. (Enoeda and Mack, 1999: 4).

Karate do permanently contributes to the individual's development, being an open door towards limits that are to be exceeded and the plenitude of this art resides in the spirit-psyhic-body communion! Within the spirit-psyhic-body communion, spiritual attitude plays a major role, even if karate is practiced as a combat sport (Deliu, 2008:121).

Also, Kancho Kanazawa (2003:35) argues that from spirit-psyhic-body bond, the most important is the spiritual conduct, even though karate is practiced as a fighting discipline.

Within the same idea Funakoshi (1981: 18) claims that the true karate-do may be practiced successfully, without generating injury problems, and through great modesty he states the followings: " karate begins through hard work and perseverance and it ends with modestie and respect".

Following research, we can say that from the informations found both via internet, by studying literature, of publications focused on karate do occur worldwide, most of them are under Japanese author, as expected, since they are the ones underlying the emergence and expansions of the sport, but we also find English or American authors and coauthors. (Lewis, 1997: pp 16-19)

The internet is offering at our disposal through accessing the word karate, around 41.900.900 results and information (Karate, 2015). From these only 27.200.200 it refers about karate do (karate do, 2015), where 368.000

results are represented by karate sports clubs, and about 104.000 different karate federations. (*Cluburi de karate*, 2015)

Also, browsing the internet for karate do articles and materials gives us around 229.000 results and information (federatii de karate, 2015), from wich 28.400 it refers about Goju Ryu stile (Goju Ryu, 2015) and only 1330 articles are from Romania, the rest of them having information about other karate do stiles. (istoria Goju Ryu, 2013)

Publications about the tactical profile of athletes presents as a main subject the tactical preparation, the tactical concept and its components, but was unable to find materials to cover specific tactical profile of the performance athlete in different sport disciplines.

We can state that in the roumanian literature the methods issues of coaching in different karate do stiles, at high performance, on different scientific themes, may be found in the following works: Petre (2011:85); Lambu (2013: 91-96); Paunescu (2004:80).

Thus, from those presented above, we believe that making a tactical profile of performance karate do athletes is motivated

*Purpose.* The present paper is a starting point for a study focused on the athletes' tactical profile, which may represent a prediction factor for the competitive performances of karate do fighters. Thus, our paper aimed to construct the karate do athletes' tactical profile, considered by us to be important for managing their preparation and increasing their performance level.

## METHODS

In the current stage of our research, we used the following methods:

- theoretical documentation in order to know the new data in dynamic content they provide literature;
- observation consisted of direct observation of high performance athletes, both in specific workouts and competitions;
- graphical representation which consisted in the expression of meanings statistical and mathematical data processing and analysis of video material used for developing tactical profile;
- analysis videos: to achieve tactical analysis were used videos materials from the major contests in the competitive year 2013, represented by four matches disputed by our athletes, respectively the finals of the National Championship, the Romania Cup, the World Championship and the European Championship.

## MATERIAL

*Subjects of the research.* The subjects of our research are top performance athletes at "Rapid" Sports Club of Bucharest, seniors, 5 boys and 4 girls, components of the WKC (World Karate Confluence) National Karate Squad, practitioners, for more than 10 years, of the Goju-Ryu style from the karate do branch.

In table 1, we present the situation of the sport track record of our subjects in the major competitions considered by us to be the most important and representative for developing the tactical profile.

Table 1. *Athletic achievements 2013*

Obtained place	Number of place National Championship	Number of place World Championship	Number of place Romanian Cup	Number of place European Championship
I	6	2	5	6
II	2	1	1	-
III	1	1	2	-

As it can be seen from the table, our subjects obtained a total of 19 gold medals, 4 silver medals and 4 bronze medals in the 4 competitions that were our goal. Our study aimed to construct the karate dotop athletes' tactical profile. The criteria taken into account for the tactical profile are:

- *technical-tactical information collected on 16.10.2013;*
- *athletic achievements 2011-2013;*

- *the analysis and interpretation of video materials from the major contests in the competitive year 2013.*

To analyze the video materials, we selected the most important criteria considered by us to be representative for their winning the victory in the fight and also for determining an athlete's value and preparation level:

- *number of points obtained at the end of a match* – wazari (1 point), ippon (2 points), upper and lower limbs strikes, kick on the right and left side;
- *preferences for the fighting style used* – attack, counter, riposte;
- *technical and tactical arsenal size and the way they use it according to the situation of the match*– number of actions made in a fight and the points obtained, score victory, victory before the regular time, games went in overtime, defeats and advertisement.

The participation in competitions occurs in conformity with a system of principles and norms referring to: the development of attack and defense (ate waza and ukewaza), the approach of the fight key-moments (kokoro), but also other aspects such as feints, kyo, combinations, renrakuwaza, counter-attack and kaeshiwaza, which are part of the tactics sphere. For this reason, tactics is defined by different authors as follows: an activity, a concept, a process or a system of operational means.

The fighting tactics is the activity through which a karate fighter uses all his technical, physical and mental possibilities in order to achieve the best competitive results, when confronted with different opponents. This is based on technical abilities, the coordination capacity, an exceptional physical preparation, rapidity in analysis and decision, being conditioned by: principles, ideas, competition norms and regulations, the result being given by an optimum behavior in each match of the competition (Deliu, 2008: 209-210).

The more an athlete is skilled (higher belt), the more the tactical problems must represent an important objective in his preparation, because the technical structure in karate do has already been mostly acquired, the modality of applying these technical procedures and elements being always adapted to the athletes' psychophysical particularities, to the most suitable tactical model for the respective opponent or match (offensive, defensive, combined ones etc.).

The *tactics components* in karate do are: *attack, defense and counter-attack*, each of them presenting various substructures and modalities. (Deliu: 201-214). The following fighting systems are more and more clearly shaped:

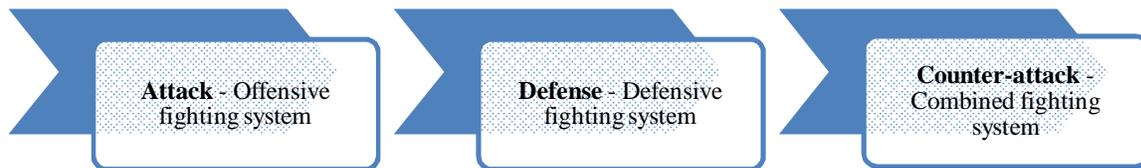


Fig.1.The tactics components in karate do and the fighting systems

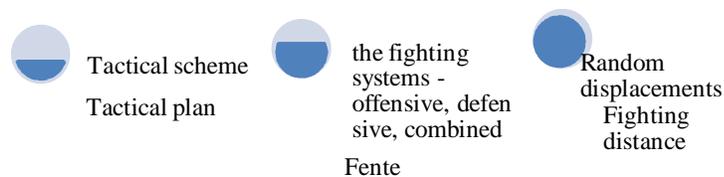


Fig. 2.The tactics components in karate do

## Results and discussions

In order to develop the general tactical profile of elite karate do athletes, were made them individual tactical profiles. Through individual tactical profiles we were able to extract common elements from the elected criteria as being essential in order to obtain victory in battle.

Thus, from the amount of points gained perspective we were able to observe how many points were obtain by wazari procedure (1 point), by ippon procedure (2 points), how many by kicking with superior and inferior limbs, through kicks done on the right and on the left side as well.

From the perspective of the fight stile, we observed how many points were obtained by attack, by counter or counterattack.

From the technical and tactical arsenal perspective and the way of using it based on every match situation, we observed how many technical procedures were used from those declared by athletes as being their favorite kicks, the number of actions done and the number of points obtained through those actions, the efficiency of actions, if the technical and tactical arsenal brought them to victory at high score ore before time limit, at losing or warnings.

As a result of the above and tactical analysis of matches played by the subjects of our research was developed tactical general profile of elite karate athletes do. This can be seen in figures 3 and 4, in terms of points obtained over them, in terms of fighting style used, and in terms of technical and tactical arsenal used in matches.

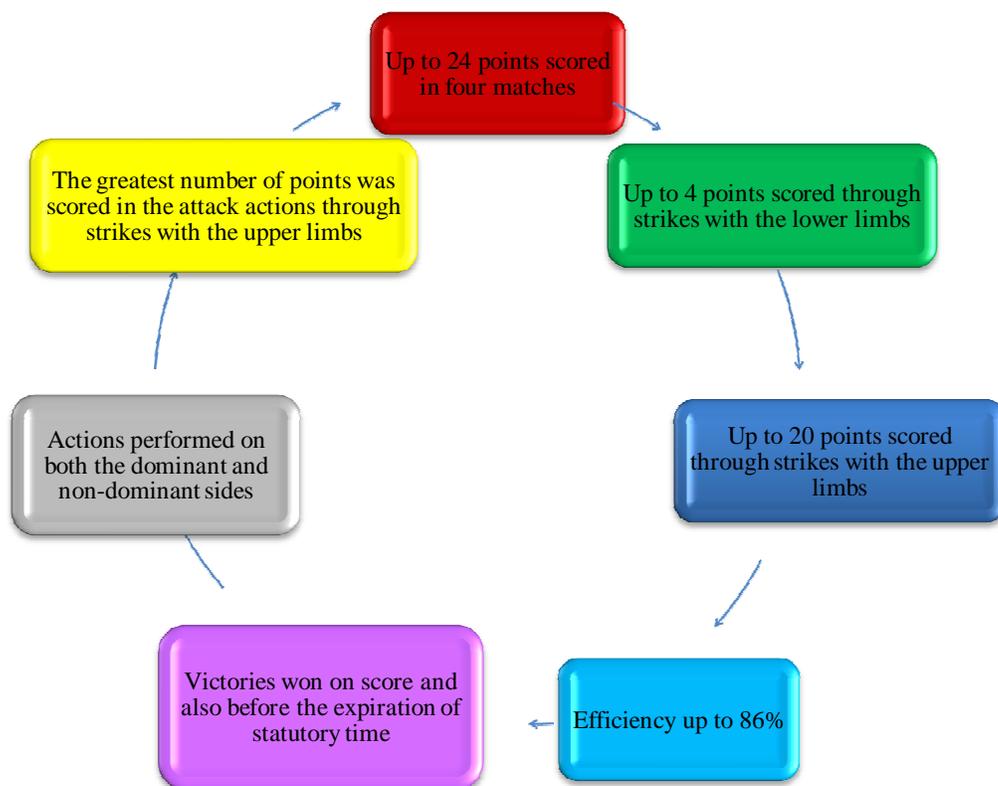


Fig. 3. General tactical profile of karate do athletes in terms of points scored

According to figure 3, we can assert that, following the tactical analysis, the karate fighter uses strikes performed with both his upper and lower limbs, by scoring important points with these two types of strikes, but the greatest number of points is ensured by the attacks through strikes with the upper limbs. At the same time, the athlete performs actions on both his dominant and non-dominant sides, his efficiency in matches is up to 86% and his victories are won on score, but also before the expiration of statutory time.

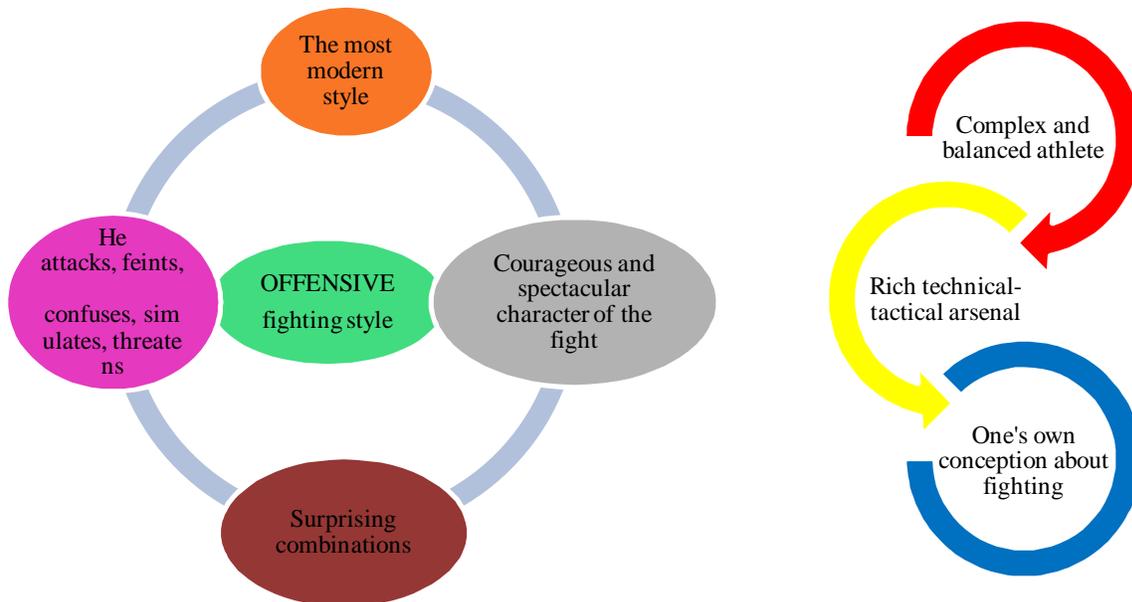


Fig.4. General tactical profile of karate do athletes in terms of fighting style and technical and tactical arsenal used.

Following the tactical analysis of the four matches disputed by our athletes and considered by us to be the most important for determining their tactical profile, we can state that the athletes' general tactical profile shows us a complex athlete, with a rich technical-tactical arsenal, with his own conception about fighting (Fig. 2). At the same time, as we can see in figure 2, the karate athlete shows a predominantly offensive fighting style, which reflects the courageous and spectacular character of the fight, through quick attacks and surprising combinations. He permanently takes the initiative, from the beginning until the end of the match, by attacking and threatening his opponent, by forcing him to make mistakes, which enables him to win the victory.

### Conclusions

We found, after the tactical analysis, that the karate athlete equally used the arm strikes and the kicks, by scoring important points with both of the types of strikes, but the greatest number of points was ensured by the attacks through the arm strikes. The karate do athlete is a complex athlete who uses both the offensive and defensive fighting styles, depending on his opponent, by having thus a combined fighting style that enables him to display his entire technical-tactical arsenal through quick attacks followed by surprising defenses and counter-attacks, all of them as efficiently and rationally coordinated as possible, in order to win the victory in the competitive fight.

We consider that through knowing the tactical profile of the karate do athlete, may offer relevant data in specific training purpose for increasing the competition results.

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## COORDINATION AND CONTROL OF THE DISTAL HAND MUSCLES IN WATER POLO PLAYERS – JUNIORS 14-15 YEARS OLD

Coordonarea și controlul musculaturii distale a mâinilor la jucătorii de polo pe apă – juniori 14-15 ani

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**Rezumat.** Cercetarea integrează metode de analiză și evaluare a capacității de coordonare și control a musculaturii distale a mâinilor și degetelor, care influențează direct sau indirect gradul de manevrabilitate a mingii/tehnica, având ca rezultat creșterea performanței sportive viitoare. Accentul se pune pe măsurarea controlului manual fin la jucătorii de polo pe apă și pe studiul oportunității unei asemenea cercetări. Cercetarea cuprinde aplicarea bateriei de teste (Bruininks-Oseretsky Test of Motor Proficiency, Second Edition) la componenții a două cluburi de polo pe apă înscrise în Campionatul Național de juniori (Clubul Sportiv Școlar 3 Steaua și Colegiul Sportiv Emil Racoviță). Sportivii testați sunt născuți în anul 1997, joacă meci de meci la echipele de club și sunt în vizorul echipei naționale. Testarea s-a desfășurat în data de 07.08.2012 la sala de jocuri sportive a UNEFS București. În urma testării, am obținut următoarele rezultate: din 24 de sportivi testați, 75% (18 sportivi) se încadrează în categoria sub medie, iar 25% (6 sportivi) se încadrează în categoria medie. La Clubul sportiv Școlar 3 Steaua, sunt 33% (4 sportivi) în categoria medie și 67% (8 sportivi) în categoria sub medie, la Colegiul Sportiv Emil Racoviță, sunt 17% (2 sportivi) în categoria medie și 83% (10 sportivi) în categoria sub medie. Această cercetare a facilitat obținerea unor valoroase informații prin mijloace nespecifice (pe uscat), privind nivelul de coordonare și control al musculaturii distale a mâinii și degetelor, necesare antrenorilor în vederea introducerii în pregătire a exercițiilor tehnice de manevrabilitate a mingii în condiții speciale (umiditate, adversitate, forța de pasare și primire, viteză, presiunea timpului, etc.), menite să îmbunătățească integrarea controlului motor (gestului motor) cu stimulul vizual.

*Cuvinte-cheie:* coordonare, control manual fin, polo pe apă, testul Bruininks-Oseretsky.

**Abstract.** The research integrates methods for analyzing and assessing the coordination and control capacity of the distal hand and finger muscles, which influences directly or indirectly the degree of ball handling /technique, resulting in an increase of the future sports performance. The emphasis is placed on measuring the fine manual control in water polo players and on studying the appropriateness of such a research. The research includes application of the test battery (Bruininks-Oseretsky Test of Motor Proficiency, Second Edition) to the members of two water polo clubs registered in the Junior National Championship (Steaua School Sports Club 3 and Emil Racovita Sports College). The tested athletes are born in 1997, play match by match at their club teams and are in the sights of the national team. Testing took place on 7 August 2012 in the sports hall of UNEFS Bucharest. After testing, the following results have been obtained: out of the 24 tested athletes, 75% (18 athletes) fall into the below-average category and 25% (6 athletes) fall into the average category. At Steaua School Sports Club 3, there are 33% (4 athletes) in the average category and 67% (8 athletes) in the below-average category, and at Emil Racovita Sports College, there are 17% (2 athletes) in the average category and 83% (10 athletes) in the below-average category. This research has facilitated the obtaining of some valuable information through non-specific means (on land), regarding the coordination and control levels in the distal hand and finger muscles, necessary for the coaches who intend to introduce in the preparation technical drills for the ball handling under special conditions (humidity, adversity, force to pass and receive, speed, time pressure, etc.), meant to improve integration of the motor control (motor gesture) with the visual stimulus.

*Keywords:* coordination, fine manual control, water polo, Bruininks-Oseretsky test.

### Introduction

Water polo game is among those sports where acyclic movements are predominant, with permanent changes in the motor dynamics and behavior (Pinnington *et al.*, 1988; Dopsaj and Matković, 1994; Smith, 1999, *quoted by* Bratusa, Perisic and Dopsaj, 2010: 245). Water polo game does not simply mean swimming, but also a great number of other specific movements performed in the horizontal and vertical positions, namely technical elements with and without the ball, with and without an opponent, all these indicating the complexity of both the water polo game and the training itself, in relation to the technical and tactical preparation of the players (Snyder, 2008). The technique of water polo game represents a set of motor skills specific in their form and content, regarding the players' movement in the water and the ball handling, which develops according to the laws of higher nervous activity and of biomechanics, in order to achieve maximum effectiveness in the game (Marinescu, Frățilă and Bălan, 2004: 43).

The psychic profile of water polo player is characterized by tactical intelligence, cooperation spirit, focused attention especially in goalkeepers, distributed attention, reaction speed especially in goalkeepers, dexterity, resistance to stress, etc. (Drăgan, 2002).

*Research hypothesis.* Testing the fine manual control through non-specific means (on land) provides information about the aquatic sports performance of the young water polo players (junior III).

## Research methods

This paper represents an ascertaining pedagogic experiment, the research methods used being the following: testing method - Bruininks-Oseretsky Test Battery, Second Edition (BOT-2), graphical method, mathematical and statistical method with the statistical parameters of central tendency - arithmetic mean (X), statistical parameters of dispersion - standard deviation (S), coefficient of variability (CV) (Popa, 2008).

## Research design

*Period, location and subjects of the research.* The experiment subjected to testing 24 athletes, members of two water polo clubs in Bucharest, registered in the National Championship: Steaua School Sports Club 3 (1<sup>st</sup> place) and Emil Racovita Sports College (3<sup>rd</sup> place). The tested athletes are born in 1997, play match by match at their club teams and are in the sights of the national team. Testing took place on 7 August 2012 in the sports hall of UNEFS Bucharest.

*The test used.* The Bruininks-Oseretsky Test of Motor Proficiency, Second Edition (BOT-2), is a test battery which is administered individually, being based on a series of very well-defined objectives directed towards the assessment of a wide range of motor skills in subjects aged between 4 and 21 years. This battery was designed for kinetherapists, psychologists, physical education teachers, coaches and not only, providing them an efficient and reliable tool for measuring the fine and gross motor skills. Because during application of the test battery the subject is forced to use the preferred hand for achieving the different tasks, the subject's preference must be established before administering the test battery (Bruininks, R. H. and Bruininks, B. D., 2005). Fine manual control refers to the coordination and control of the distal hand and finger muscles, particularly in grasping, writing and drawing activities.

Description of subtests:

- **Subtest 1:** Fine Motor Accuracy. This subtest is made up of activities that require an accurate movement coordination of hands and fingers. It contains an item for the drawing activity, one for that of double-folding a sheet of paper and an item for the cutting out activity. Drawing tasks include filling some forms, marking some lines on certain paths and joining some points. The objective of each item is to draw, draw lines, cut out and double-fold a sheet of paper taking into account certain fixed limits, the performance being assessed depending on how well the subject manages to remain within these limits. Because the emphasis is placed on accuracy, the tasks included in this subtest are not timed.
- **Subtest 2:** Fine Motor Integration. This subtest requires the subject to reproduce different geometrical forms, which have different degrees of complexity, from a simple circle and up to the form of some pencils that interpenetrate. The subject is asked to reproduce these figures as accurately as possible. Like in the previous subtest, the drawing tasks within this subtest necessitate a precise control over the hand and finger movements and, consequently, they are not timed. However, as the subject must reproduce a drawing without any visual help or other kind of guidance, this subtest measures the ability to integrate the motor control with the visual stimulus. This type of integration is known under the name of "visual-motor integration".

## Presentation, analysis and interpretation of results

Table 1. Results achieved at subtest 1 (Fine Motor Accuracy)

Emil Racovita Sports Club				Steaua School Sports Club 3		
Item no.	Surname and name	Scaled score	Category description	Surname and name	Scaled score	Category description
1.	T.I.	12	Average	M.C.	19	Average
2.	N.D.	11	Average	C.M.	14	Average
3.	J.A.	13	Average	C.G.	16	Average
4.	B.A.	20	Above average	C.D.	10	Below average
5.	L.A.	7	Below average	T.P.	12	Average

6.	C.D.	10	Below average	I.R.	10	Below average
7.	V.A.	19	Average	B.A.	12	Average
8.	M.C.	10	Below average	B.P.	14	Average
9.	I.F.	9	Below average	M.I.	7	Below average
10.	P.G.	9	Below average	B.A.	12	Average
11.	G.V.	11	Average	T.S.	19	Average
12.	Z.I.	14	Average	S.V.	19	Average
<hr/>						
X		12.083		X		13.666
S		±3.941		S		±3.938
CV		32.621%		CV		28.821%

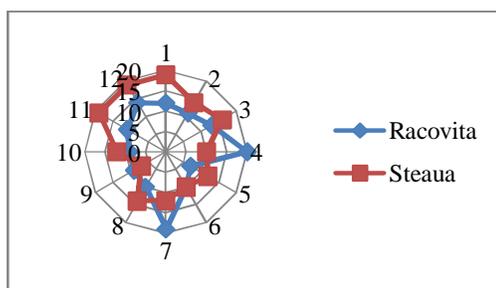


Fig 1. Dispersion of scaled scores

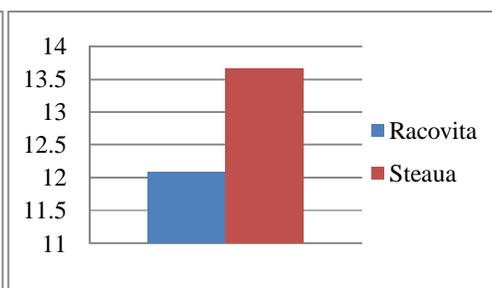


Fig 2. Averages of scaled scores

The average score obtained at the Fine Motor Accuracy subtest is  $X = 12.083$  points for the Racovita athletes and  $X = 13.666$  points for those from Steaua. The difference between the two means is  $X = 1.583$  points in favor of the Steaua athletes, resulting thus that, at this subtest, the athletes belonging to Steaua Club have achieved a higher score (Table 1 and Fig. 2). Standard deviation is  $S = \pm 3.941$  points for the Racovita athletes and  $S = \pm 3.938$  points for those from Steaua. The difference is  $S = \pm 0.003$  points in favor of the Steaua athletes. The coefficient of variability,  $Cv = 32.621\%$  for the athletes from Racovita, shows that these ones form a non-homogeneous group, with a high dispersion of results. The coefficient of variability,  $Cv = 28.821\%$  for the athletes from Steaua, shows that these ones form a non-homogeneous group, with a high dispersion of results. The difference is  $Cv = 3.8\%$  in favor of the athletes from Steaua, which shows that the degree of dispersion of the results obtained by the Steaua athletes is lower in comparison with the results obtained by the Racovita athletes.

Table 2. Results obtained at subtest 2 (Fine Motor Integration)

Emil Racovita Sports Club				Steaua School Sports Club 3		
Item no.	Surname and name	Scaled score	Category description	Surname and name	Scaled score	Category description
1.	T.I.	9	Below average	M.C.	14	Average
2.	N.D.	10	Below average	C.M.	7	Below average
3.	J.A.	8	Below average	C.G.	10	Below average
4.	B.A.	9	Below average	C.D.	9	Below average
5.	L.A.	8	Below average	T.P.	7	Below average
6.	C.D.	8	Below average	I.R.	8	Below average
7.	V.A.	11	Average	B.A.	7	Below average
8.	M.C.	7	Below average	B.P.	9	Below average

9.	I.F.	8	Below average	M.I.	8	Below average
10.	P.G.	7	Below average	B.A.	9	Below average
11.	G.V.	7	Below average	T.S.	7	Below average
12.	Z.I.	6	Below average	S.V.	8	Below average
<hr/>						
X		8.166		X		8.583
S		±1.403		S		±1.975
CV		17.185%		CV		23.012%

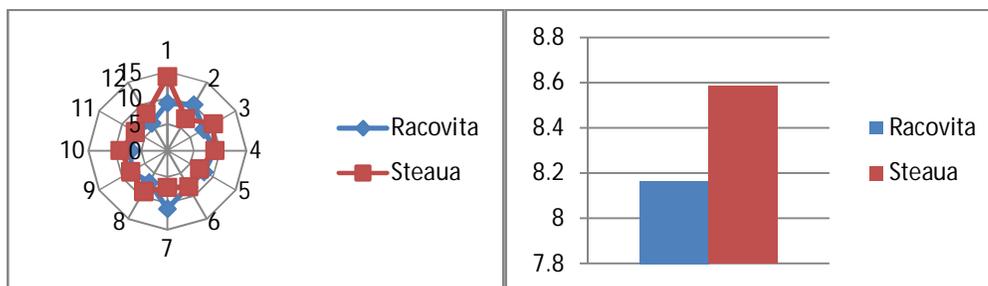


Fig 3. Dispersion of scaled scores

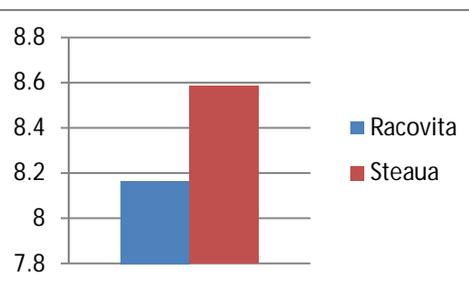


Fig 4. Averages of scaled scores

The average score obtained at the Fine Motor Integration subtest is  $X = 8.166$  points for the Racovita athletes and  $X = 8.583$  points for those from Steaua. The difference between the two means is  $X = 0.417$  points in favor of the Steaua athletes, resulting thus that, at this subtest, the athletes belonging to Steaua Club have achieved a higher score (Table 2 and Fig. 4). Standard deviation is  $S = \pm 1.403$  points for the Racovita athletes and  $S = \pm 1.975$  points for those from Steaua. The difference is  $S = \pm 0.572$  points in favor of the Steaua athletes. The coefficient of variability,  $Cv = 17.185\%$  for the athletes from Racovita, shows that these ones form a medium homogeneity group, with a medium dispersion of results. The coefficient of variability,  $Cv = 23.012\%$  for the athletes from Steaua, shows that these ones form a non-homogeneous group, with a high dispersion of results. The difference is  $Cv = 5.827\%$  in favor of the athletes from Racovita, which shows that the degree of dispersion of the results obtained by the Racovita athletes is lower in comparison with the results obtained by the Steaua athletes.

Table 3. Results obtained for the Fine Manual Control

Emil Racovita Sports Club				Steaua School Sports Club 3		
Item no.	Surname and name	Scaled score	Category description	Surname and name	Scaled score	Category description
1.	T.I.	38	Below average	M.C.	52	Average
2.	N.D.	40	Below average	C.M.	38	Below average
3.	J.A.	40	Below average	C.G.	44	Average
4.	B.A.	48	Average	C.D.	36	Below average
5.	L.A.	32	Below average	T.P.	36	Below average
6.	C.D.	35	Below average	I.R.	35	Below average
7.	V.A.	48	Average	B.A.	36	Below average
8.	M.C.	34	Below average	B.P.	40	Below average
9.	I.F.	36	Below average	M.I.	32	Below average
10.	P.G.	35	Below average	B.A.	38	Below average
11.	G.V.	37	Below average	T.S.	42	Average
12.	Z.I.	37	Below average	S.V.	43	Average
<hr/>						
X		38.333		X		39.333
S		±5.069		S		±5.331

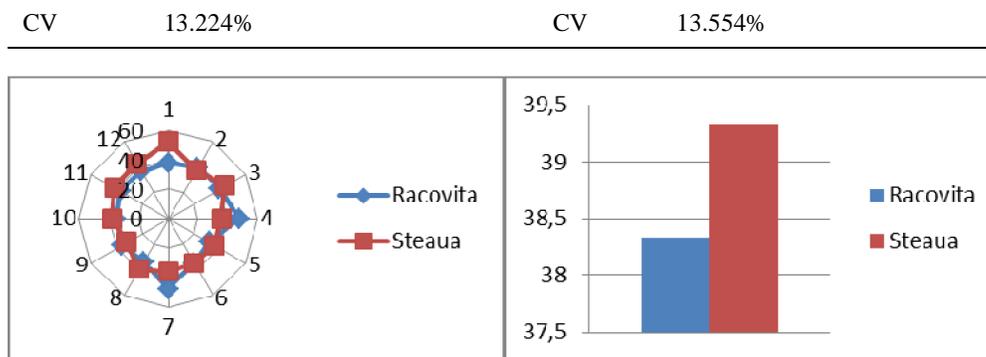


Fig 5. Dispersion of standard scores

Fig 6. Averages of standard scores

The average score obtained at the Fine Manual Control is  $X = 38.333$  points for the Racovita athletes and  $X = 39.333$  points for those from Steaua. The difference between the two means is  $X = 1$  point in favor of the Steaua athletes, resulting thus that, at this subtest, the athletes belonging to Steaua Club have achieved a higher score (Table 3 and Fig 6). Standard deviation is  $S = \pm 5.069$  points for the Racovita athletes and  $S = \pm 5.331$  points for those from Steaua. The difference is  $S = \pm 0.262$  points in favor of the Racovita athletes. The coefficient of variability,  $Cv = 13.224\%$  for the athletes from Racovita, shows that these ones form a medium homogeneity group, with a medium dispersion of results. The coefficient of variability,  $Cv = 13.554\%$  for the athletes from Steaua, shows that these ones form a medium homogeneity group, with a medium dispersion of results. The difference is  $Cv = 0.33\%$  in favor of the athletes from Racovita, which shows that the degree of dispersion of the results obtained by the Racovita athletes is lower in comparison with the results obtained by the Steaua athletes.

### Conclusions

- General and specific physical preparation on land is particularly important to children and juniors, for increasing the water-specific motor acquisitions;
- Utilization of several forms of ball handling in the preparation on dry land, under usual and unusual conditions, facilitates the acquisitions related to improvement of the motor control (motor gesture) with the visual stimulus, translated into technical elements and procedures executed with maximum efficiency.
- The psychomotricity gained through the non-specific preparation on land realizes a positive transfer towards the specific preparation in the water, improving the motor skills and abilities;
- Testing the fine manual control through non-specific means (on dry land) provides information about the aquatic sports performance of the young water polo players (junior III) – *the hypothesis is confirmed*;
- Results achieved in the championship by the athletes belonging to Steaua School Sports Club 3 versus the athletes belonging to Emil Racovita Sports College corroborate with the results obtained after applying the Bruininks-Oseretsky Test Battery, Second Edition (BOT-2).

### Acknowledgement

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Wager, T. D., Rilling, J. K., Smith, E. E., Sokolik, A., Casey, K. L., Davidson, R. J., ... & Cohen, J. D. (2004). Placebo-induced changes in fMRI in the anticipation and experience of pain. *Science*, 303(5661), 1162-1167.

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