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(RECOMMENDED CITATION)

STUDY OF THE BODY VALUES IN THE CONTEXT OF THE NEW MASTER PROGRAMS. A COMPARATIVE ANALYSIS OF THE STUDENTS FROM THREE MASTER PROGRAMS OF PHYSICAL EDUCATION AND SPORT FACULTY CLUJ-NAPOCA

IOSIF SANDOR[1]*, IOAN VIRGIL GANEA[1], EMANUELE ISIDORI[2], ADRIAN PASCAN[1], GABRIELA VIRGINIA RUSU[3]

ABSTRACT. With the establishment of new Master programs, the option of students includes a wide range which reflects, in most cases, some tangible values. When choose follow the Masters program, not all students are aware, not all of them take it into account. The Magister students came from different social, cultural and geographical backgrounds. Their basic body values have different aspects like a social, cultural and geographical reflection. Those reflections differ from one society to another from one individual to another. The type of body values dominant in Romanian society are mostly those which are connected to the hedonistic, esthetic and emotional dimension of the body itself. Therefore, our study aims to prioritize and emphasize those values that Master students of the Faculty of Physical Education and Sport of the Babes-Bolyai University in Cluj-Napoca are endowed as part of their studies in order to facilitate their integration into social life, highlighted by the changes of modern society post EU accession.

Keywords: *students, master degree programs, education*

REZUMAT. ***Studiu privind valorile corporale în contextul noilor programe Masterale. Analiza comparativă a studenților din cadrul a trei programe Master a Facultății de Educație Fizică și Sport din Cluj-Napoca.*** Odată cu înființarea noilor programe Masterale, opțiunea studenților cuprinde o paletă largă ce reflectă, în majoritatea cazurilor, anumite valori corporale de care, în momentul alegerii programului masteral de urmat, nu toți studenții sunt conștienți și de care nu toți țin cont. Studenții masteranzi provin din medii sociale și geografice

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diferite în care valorile corporale capătă aspecte diferite, de la o societate la alta de la un individ la altul. În general, în România, tipologia valorilor umane este asociată cu dimensiunile hedonistice, estetice şi emoţionale ale corpului uman. Tocmai de aceea, studiul nostru are ca obiectiv să ierarhizeze şi să scoată în evidenţă acele valori cu care studenţii masteranzi ai Facultăţii de Educaţie Fizică şi Sport ai Universităţii Babeş-Bolyai din Cluj-Napoca sunt înzestraţi ca parte integrantă a formării caracterului lor ce le va facilita integrarea în structurile vieţii sociale puse sub influenţa transformărilor societăţii moderne post aderare la Uniunea Europeană.

Cuvinte Cheie: *studenţi, master, programe, educaţie*

Introduction

The human body it is an entity, a very complex system who synthesize the biological, psychological, social, emotional etc., dimensions of the human being that presents multiple levels of development. In our study, we try to present how the biological dimension could achieve, through his ontology, different values.

Our body is a hermeneutical tool and a category by which we can interpret the world. The body is a fundamental component of education itself. Therefore we can say that the starting point of any education is always the body and that education can be seen as a process, through which the human body develops, from a simple condition of material and biological existence into a spiritual awareness (Isidori, 2002).

The Physical Education and Sport curricula of the Faculty of Physical Education and Sport "see" the body like a biological, physiological, sociological and culturally integrated system involving various levels of acts, actions and activities inseparable from the experience of the person. The curricula, give for each student the freedom and possibility to develop the skills in order to be well prepared for life. Everybody could be educated.

Study of the body and its values, in the context of sport and physical education, offer a new way of thinking about a human being and her/his interaction with society. Body values are always images and depend by the society in which we live (society shapes body and bodies shape society through values in a continuous circle). Values are always expressed by bodies (who are the human beings). For this reason, there exists a strict connection among body, values and society, and if we study the body values of a person or a group of people, we have the possibility of reconstructing the images and characteristics of the society in which they live (Isidori et al., 2010).

The aim of this research is to compare and evaluate the body value priorities of the students of three Master degree programs from Physical Education and Sport Faculty of "Babes-Bolyai" University Cluj-Napoca: 1. Physical Education, Fitness and Outdoor activities – Educatie Fizica, Fitness si Agrement in Turism (EFFAT), 2. Training and Sport Performance – Antrenament si Performanta Motrica (APS), 3. Kinetoterapy in the Affections of Locomotors Apparatus – Kinetoterapia in Afectiunile Aparatului Locomotor (KAAL). The main assumption of the research was that, detecting the hierarchy of values in each Master program, the students can better understand and apply into the life their specific attitudes and culture earned after a three year of license studies. The Master degree programs must show one mature student and their way of thinking and relating not only to sport but also with the entire society and the citizens too.

Theoretical framework

This study aims to draw the hierarchy of body values in three Master degree programs university students, the future educators, coaches, tourism managers and professionals of body care and well-being in European society; those in order to understand their preferences, the limitations of specific professional education taught during the three years of license studies at University, and the possible cultural differences that can emerge from the three different Master degree programs.

The three Master degree programs – EFFAT, APS and KAAL – in which this comparative research has been carried out are different in terms of specific activities, but not so much in point of view of culture, language and social traditions.

Methods of research

To carry out the research, about 90 subjects - female and male Master degree students were selected.

The students' values hierarchy was obtained through a Spanish questionnaire (Gervilla 2000, cit. Isidori et al., 2010) adapted and translated into Romanian. The questionnaire was based on a Likert scale of summated ratings. The aim of the questionnaire was to detect the level of agreeability or disagreeability shown by each Master degree student when presented with some words regarding 10 main body values models, that is: biological body (BIO); ecological body (ECO); instrumental body (INS); dynamic/sporting body (DYN), emotional/social body

(EMO); ethical body (ETH); esthetic body (EST); religious body (REL); intellectual body (INT); pleasure body (PLE). These models aim to represent all the dimensions of the human body, and are based on Howard Gardner's theory of multiple intelligences (2006).

The test consisted of 10 forms, 25 words each, concerning the 10 body models identified above. An algebraic addition of the obtained scores was made. The closer the reported score for each group of 25 words was to 50 (or -50), the more the subject was shown to prefer (or not to prefer) that body values' model.

Data analysis

The following analyses were done: per the three Master Programs (see fig. 1); per gender (see fig. 2); - per geographical birthplace Rural / Urban (see fig. 3).

Figure 1 show that the highest scores are presented at the intellectual and biological body values and the smallest scores are presented at the religious one. In five cases, the APS students have the highest values. The lowest value has the KAAL students at religious body.

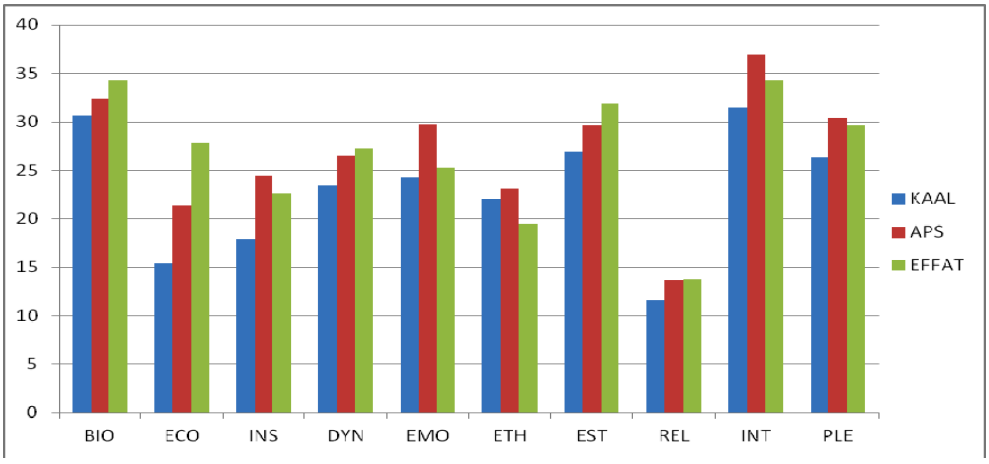

Figure 1. Analysis of variance per Master Programs

Figure 2 show that there is a considerable difference between genders in biological and intellectual values, followed by esthetical, dynamic and pleasure values. In all those cases, the women (EFFAT and APS) values are more significant than the men's is.

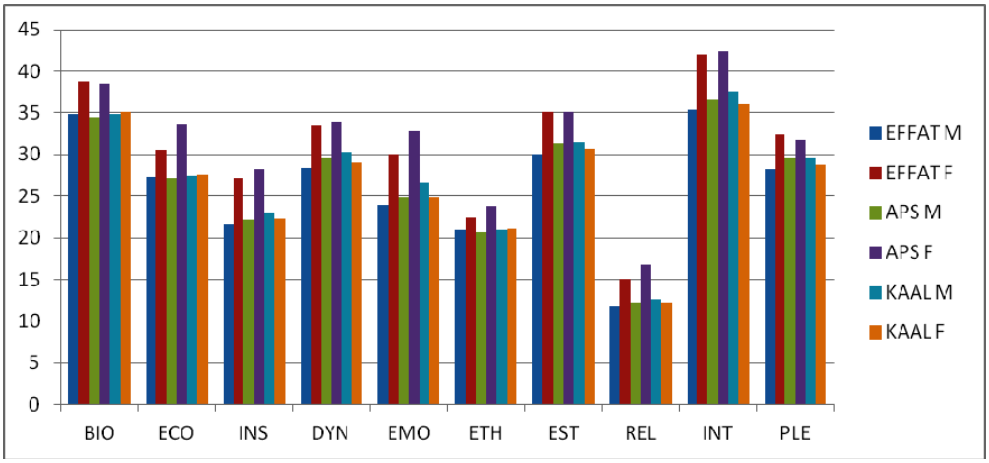

Figure 2. Analysis of variance per gender

In the Figure 3, we can observe the geographical space from where the students are coming from. The figure demonstrates the connection between body and values (that is, thinking and behaviors) and the possible differences that exist among students due to their gender and space of birth.

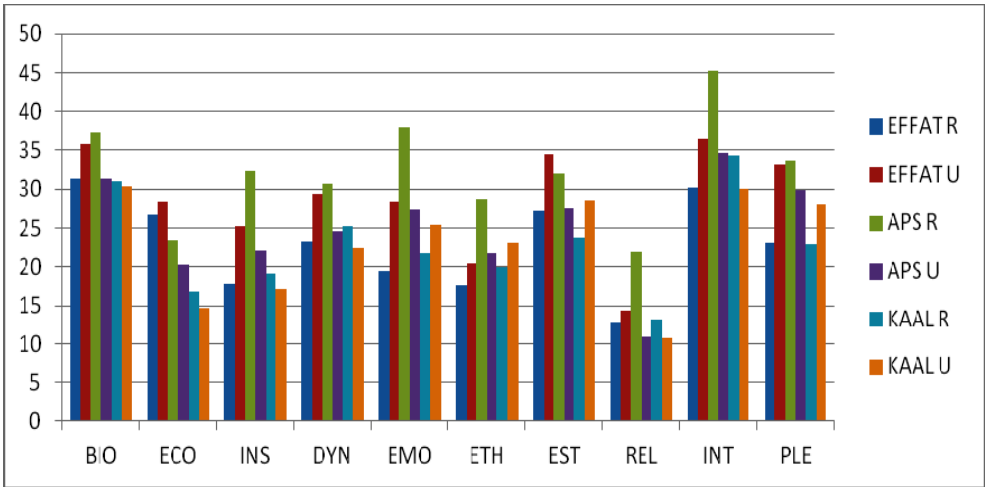

Figure 3. Analysis of variance per geographical birthplace (URBAN /RURAL space)

Results and discussion

The research shows some differences in the perception of body values among the three Master degree students. Generally speaking, and with reference to the following values, the three groups of students demonstrate the following differences:

1. Intellectual and Biological body values: all Master degree students have a deeper perception of those body dimensions. They already need the acquisition of those dimensions in order to be intellectually and biologically active.
2. Dynamic body values (that is sporting body values): at all Programs are situated, like values, right at the middle of the hierarchy.
3. Ecological body values: the KAAL and APS students are more sensitive and aware of these kinds of values than the EFFAT students has. The practical dimension of the body it is not considered to be more agreeable by KAAL and APS students. Probably they consider that been involved in Master programs the goals are on the research activities and not on practical one.
4. Esthetic and Pleasure body values: the KAAL and EFFAT students consider this kind of body value as agreeable.
5. All students present the lowest religious body values.
6. The female of EFFAT and APS students present the highest values at ALL the body models.
7. The APS rural students present the highest values in eight body values models. The KAAL urban students have in four situations the smallest values.

All the data collected have been used to outline the three Master degree programs sport sciences students' body values hierarchy. This hierarchy, which allows us to draw a general body values profile of Master degree students, has been compared. The values are different and form a hierarchy, different for each person.

Table 1 shows the average points of the KAAL, APS and EFFAT students' response regarding each body value while table 2 shows the arrangement of values in order of their significance in the views of these students.

Table 1. Average of body values' scores

	BIO	ECO	INS	DYN	EMO	ETH	EST	REL	INT	PLE
KAAL	30,6	15,375	17,875	23,425	24,2	22,05	26,9	11,6	31,475	26,3
APS	32,32	21,36	24,44	26,48	29,72	23,16	29,6	13,68	37	30,4
EFFAT	34,24	27,8	22,6	27,16	25,2	19,44	31,92	13,72	34,28	29,6

Table 2. Compared body values hierarchy profiles of KAAL, APS and EFFAT Master Students

Values Hierarchy KAAL		Values Hierarchy APS		Values Hierarchy EFFAT	
1	Intellectual / 31,475	**1**	Intellectual / 37	**1**	Intellectual L / 34,28
2	Biological / 30,6	**2**	Biological / 32,32	**2**	Biological / 34,24
3	Esthetic / 26,9	**3**	Pleasure / 30,4	**3**	Esthetic / 31,92
4	Pleasure / 26,3	**4**	Emotional / 29,72	**4**	Pleasure / 29,6
	Emotional / 24,2	**5**	Esthetic / 29,6	**5**	Ecological / 27,8
6	Dynamic / 23,425	**6**	Dynamic / 26,48	**6**	Dynamic / 27,16
7	Ethical / 22,05	**7**	Instrumental / 24,44	**7**	Emotional / 25,2
8	Instrumental / 17,875	**8**	Ethical / 23,16	**8**	Instrumental / 22,6
9	Ecological / 15,375	**9**	Ecological / 21,36	**9**	Ethical / 19,44
10	Religious / 11,6	**10**	Religious / 13,68	**10**	Religious / 13,72

Conclusions

The results of this research have shown that the hierarchies of body values of Master degree program students respect the goals and aims of every student in particularly and of the University curricula in generally. Further, there are differences in the perception of values among students due to cultural and historical differences, the traditions sportive and intellectual heritage of the societies where they live and came from.

This research has also highlighted the need to develop a more effective moral education within the curricula of the three Masters programs studied at the Institution. This education ought to focus on ethics and environmental values, which are considered less important by students.

The point of view of this research is that all the body values are important and, for this reason, in order to improve competences, there are no values more or less important for specific skills acquisition.

The curricula of the Master degree programs, the body values always express the multidimensionality of the human being which is in the concordance of the society expectations. A lack of values in any of these dimensions can obstruct a correct professional development of the students. In order to become a good professional, with high competences, it is important to develop an international recognized *Master degree programs* including a curricula focused on developing the body values which helps university students to develop all the dimensions of their competences.

Therefore, the three sport sciences university's studied must try to develop, through the use of specific teaching programs or didactic tools, a curricula focusing on education for body values aimed at developing deeper competences in students who will be the future European sport scientist professionals.

REFERENCES

Bale, J. (2003). *Sports Geography*, Taylor & Francis e-Library

Biddle J.H.S; Soos I.; Hamar P.; Sandor I.; Simonek J.; Karsai I.; Murdey D.I. (2009). *Physical activity and sedentary behaviours in youth: Data from the Central-Eastearn European countries.* European Journal of Sport Science, 9(5), 295-301

Ghinăraru, C., şi colab. (1998). *Studiu privind condiţiile şi posibilităţile existente în mediul rural pentru practicarea activităţilor fizice şi sportive, interesele şi preferinţele populaţiei în acest sens*, Bucureşti

Girginov, V. (1998). *Capitalist philosophy and communist practice: The transformation of Eastern European sport and the International Olympic Committee,* Culture, Sport, Society: Cultures, Commerce, Media, Politics, 1:1, 118-148

Isidori, E. (2002). *La pedagogia come scienza del corpo.* Roma, Anicia

Isidori, E. (2009). *La pedagogia dello sport.* Roma, Carocci

Isidori, E., Fraile, A. (2008). *Educazione, sport e valori. Un approccio critico-riflessivo.* Roma: Aracne

Isidori, E. et al. (2010). *Analyzing Body Values in the Context of Postmodern Youth Education. A Comparative Study Between Italy, Latvia and Romania,* Physical Culture and Sport Studies and Research, DOI: 10.2478/v10141-010-0017-x, vol. XLIX, 65-71

Ionescu, G. (1972). *Omul contemporan şi mediul său de viaţă,* vol. Omul şi lumea contemporană, Bucureşti, Ed. Ştiinţifică

McNeill L.H., Kreuter M.W., Subramanian S.V. (2006). *Social Environment and Physical Activity: A review of concepts and evidence.* Social Science & Medicine, 63(4): 1011-1022

Paşti, V., Miroiu, M., Codiţă, C. (1997). *România - starea de fapt*, vol. I - Societatea, Bucureşti, Ed. Nemira

Sandor, I. (2005). *Mediul rural din România şi performanţa sportivă*, Cluj-Napoca, Ed. Risoprint

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THE IMPORTANCE OF MAINTAINING OPTIMAL HEALTH THROUGH PHYSICAL EXERCISE IN ASSESSING STUDENTS UBB CLUJ-NAPOCA

GABRIELA MARIA POP[1*], HOREA POP[1]

ABSTRACT. Physical health of man means a good health of the body, obtained through regular physical activity (exercise), good nutrition, and adequate rest. Optimal health many advantages a person's life. The way in which he understood to acquire and maintain health has great significance both for him and for society. Health is deeply connected lifestyle. Achieving perfect health, with all the effort, will remain a target difficult if not impossible, because human life is subject to permanent change. In the present study we aimed to what extent Babes-Bolyai University (BBU) students appreciate the importance of the physical exercise in maintaining optimal health status. We applied a questionnaire on a number of 465 students from 13 faculties. Respondents were aged between 18 and 40 years, with the vast majority being students between 19-21 years. A percentage of 71.7% of the students appreciated the physical activities as very important, 20.2% important and we appreciate that only 8.1% unimportant. In assessing the importance of weight control 52.2% felt it was very important, 25.3% important, and for 22,5% unimportant. Assessment of body image reflects the vision of respondents on a body in optimal standards that maintain through physical activities. In this context 48.8% of students say it is very important, 29.4% say it is important, and 21.8% do not appreciate bodily appearance. Recognizing the benefits of physical exercise is important, as well as efficient organization of leisure that include physical activities.

Keywords: *physical and mental health, physical activities, weight control, body image, leisure.*

REZUMAT. ***Importanţa menţinerii stării de sănătate optimă prin exerciţii fizice în aprecierea studenţilor din UBB Cluj-Napoca.*** Sănătatea fizică a omului înseamnă o stare bună de sănătate a corpului, obținută datorită activității fizice regulate (exercițiu), unei bune nutriții, și odihnei adecvate. Sănătatea optimă aduce multe avantaje vieții unui om. Felul în care acesta înțelege să-și dobândească și să-și

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menţină sănătatea are mare însemnătate atât pentru el cât şi pentru societate. Sănătatea este legată profund de stilul de viaţă. Obţinerea unei sănătăţi ideale, cu toată strădania, va rămâne o ţintă dificil de atins dacă nu chiar imposibilă, pentru că viaţa umană este supusă schimbării permanente. În lucrarea de faţă am urmărit în ce măsură studenţii UBB apreciază importanţa exerciţiilor fizice în menţinerea unei stări de sănătate optime. Am aplicat un chestionar pe un număr de 465 de studenţi din 13 facultăţi. Repondenţii au avut vârste cuprinse între 18 şi 40 de ani, majoritari fiind studenţii cu vârsta cuprinsă între 19 – 21 de ani. Un procent de 71,7% din studenţi au apreciat exerciţiile fizice ca fiind foarte importante, 20,2% le apreciază ca importante şi numai 8,1 % neimportante. În aprecierea importanţei controlului greutăţii corporale 52,2% l-au considerat foarte important, pentru 25,3% este important, iar pentru 22,5 neimportant. Aprecierea imaginii corporale reflectă viziunea repondenţilor asupra unui corp în standarde optime ce se menţine prin exerciţiu fizic. În acest context 48,8% dintre studenţi susţin că aceasta este foarte importantă, 29,4% spun că este importantă, iar 21,8 nu apreciază aspectul corporal. Recunoaşterea beneficiilor exerciţiilor fizice este importantă, la fel şi organizarea eficientă a timpului liber ce să cuprindă practicarea activităţilor fizice.

Cuvinte cheie: *sănătate fizică şi psihică, activitate fizică, controlul greutăţii, imagine corporală, timp liber.*

Introduction

Modern life of individual brings many disadvantages in health plan in the reduced physical usability at work, but also outside it. Because many technical means resulting from scientific progress in the life of modern man have decreased considerably situations that require the body to manifest through physical activities. A good health is a fundamental component of human welfare (Alber and Kohler, 2004, cf. Pop C.E., 2010, p. 274), representing a value in itself. On an individual level, a good health is an important part of human capital, enabling people to perform their work, meet their goals, to have a full life and be active members of society (Mărginean and others, 2006, cf. Pop C. E., 2010, p. 274).

Optimal health many advantages a man's life giving energy, enthusiasm and joy of life, and psychological balance to overcome life's challenges. The way in which he understood to acquire and maintain health reflects both personally and on society to which it belongs.

Hypothesis

The significance of physical activity to maintain health among students from Babes-Bolyai University.

Methods and materials

The subjects of this study were students from 13 faculties BBU. We applied a questionnaire on a number of 465 students, boys (n = 116) and girls (n = 349), aged between 18 and 40 years of years of study I and II, the vast majority having between 19 to 21 years, representing 91.3% of students.

To investigate the issues addressed in the research, we used a questionnaire with which we pursued several objectives. Among others we analyzed the frequency of student participation in physical activity during their leisure time and their recognition and awareness of the importance of the influence of these types of activities in weight control, stress management, body image, physical and mental health. The questionnaire contained closed questions with multiple choice answers for which we used ordinal Likert scale with 5 steps. Data obtained using research tools and techniques have been processed and presented in interpreting and drawing conclusions. To achieve the plots we used the Software Microsoft EXCELL, version 2007. For processing the data collected in the study, after they have been defined and grouped, as well as for the calculation of statistical indicators and correlational analysis was used for statistical analysis program SPSS 20.

From the range of tools provided by this software product we used in this analysis, calculating the frequency and the correlation coefficients between some selected variables.

As an important requirement to the students was to specify how often participate in physical activities such as sports, fitness or walking in their leisure time. Response options were “never,” “several times a year”, “several times a month”, “several times a week” and “every day”.

Satisfaction participation in physical activities such as sports, fitness or leisure walks was measured graded on a scale from 1 - 5, where 1 means not at all satisfactory and 5 - very satisfactory.

In another item of the questionnaire was aimed at assessing students vis-a-vis the importance of practicing physical activity for weight control, stress management, body image and maintaining physical and mental health. Students were assented a score from 1 – 5, where 1- means not important and 5 - very important for these goals.

Results

Table 1. Participation in physical activities such as sports, fitness or walk

	Never	The many times per year	The many times per month	The several times a week	Every day	Total
Frequency	11	53	145	163	93	465
Valid percent	2,4%	11,4%	31,2%	35,1%	20%	100%

When asked how often participate in physical activities such as sports, fitness or walks in their leisure time, Table 1 shows a high student participation in physical activities in their leisure time. It is appreciated that most of their leisure time doing various forms of movement.

From the high percentage of students who spend time engaging in various forms of movement, it highlights a great satisfaction for them that offers them participation in sport, fitness exercises and walks outdoors. Satisfaction is outlined clearly in Table 2 in which a percentage of 32.3% are very satisfied with what they offer physical activity through the palette of forms of movement. This category of students with those who feel only satisfaction through movement (28.2%) go over 60% of the sample compared to those for whom physical activity does not have much importance.

Table 2. The satisfaction of participating in physical activities: sports, fitness, walking

The satisfaction of participating in physical activities: sports, fitness, walking	Never not satisfactory	Un-satisfactory	Neither satisfactory nor unsatisfactory	Satisfactory	Very satisfactory	Total
Frequency	16	43	125	131	150	465
Valid Percent	3,4 %	9,2 %	26,9 %	28,2 %	32,3 %	100,0 %

For the variable satisfaction participation in physical activities aimed to identify the degree of satisfaction of students to physical activities. I wanted to know the frequency of attitudes youth favorable to the practice of physical

activities. After analyzing the results we found that students have a positive attitude to involvement in physical movement, as shown in Table 1. A small number of young people express an attitude of indifference to this type of activities.

Table 3 presents awareness of the importance of physical activity for students from BBU on physical and mental health.

Table 3. The importance of physical and mental health

Scale of importance	1	2	3	4	5	Total	Missing	Total
Frequency	6	8	23	92	327	456	9	465
Valid Percent	1,3 %	1,8	5,0 %	20,2 %	71,7 %	100,0 %		

After collecting data and analyzing the results we found that the higher frequencies were recorded on the upper range of the scale (5). This enables us to conclude that young people have a very good perception, raised the importance of physical activity for physical and mental health.

Table 4. The importance of weight control

Scale of importance	1	2	3	4	5	Total	Missing	Total
Frequency	14	21	68	116	239	458	7	465
Valid Percent	3,4 %	9,2 %	26,9 %	28,2 %	32,3 %	100,0 %		

Table 5. The importance of stress management

Scale of importance	1	2	3	4	5	Total	Missing	Total
Frequency	12	13	58	121	253	457	8	465
	3,4 %	9,2 %	26,9 %	28,2 %	32,3 %	100,0 %		

Analysis of the results of the importance of physical activity in weight control and stress management as it can follow in Table 4 and 5 was found that the higher frequencies and close in value were recorded in the upper range of the

last three values of the scale (3, 4 and 5). As a conclusion we can say that young people appreciate the importance of physical activity in weight control and stress management but are not as important as physical and mental health.

Table 6. The importance of body image

Scale of importance	1	2	3	4	5	Total	Missing	Total
Frequency	12	25	63	135	224	459	6	465
	2,6 %	5,4 %	13,7 %	29,4 %	48,8 %	100,0 %		

Body image can be conceptualized as a multidimensional construct that represents how individuals think, feel, and act on their own physical attributes (Heatherton and Held 1998).

Research has shown that participation in sports has a positive effect on children and adolescents that is manifested by increasing self-esteem in parallel with overall better physical condition (Pascarella & Smart, 1991; Slutzky & Simpkins, 2009; Taylor & Turek, 2010 cf. Omarsson 2013).

In this study the importance of physical activity to the students body image appears slightly modified in the sense of an increase in the range of the highest compared to the last two variables, we increase that to the fact that students overwhelmingly participated in the research because they are a significant number among students of UBB. It may reveal that exercise is considered as an important factor shaping the body and maintain the desired appearance.

Correlation Coefficients (Pearson) between weight control, stress control, body image, the importance of physical and mental health, the satisfaction of participating in physical activities are all positive, relatively weak, but significant. Each of the calculated coefficients are significantly different from zero which shows that there is correlation between variables. Significant correlations, averages are between body weight and body image (0.55), the importance of physical and mental health and stress management (0.494), the satisfaction of Participating in physical activities and participation in physical activities (0.464) higher. The lowest recorded weak correlation between participation in physical activities and stress management (0.063) and participation in physical activities and the importance of physical and mental health (0.147).

Table 7. Correlation coefficients (Pearson) between weight control, stress control, body image, the importance of physical and mental health, the satisfaction of participating in physical activities: sports, fitness, walking and participation in physical activities: sports, fitness, walking.

	Weight control	Stress control	Body image	The importance of physical and mental health	The satisfaction of participating in physical activities: sports, fitness, walking	Participation in physical activities: sports, fitness, walking
Weight control	1	0.448	0.550	0.297	0.152	0.151
Stress management	-	1	0.374	0.494	0.167	0.063
Body image	-	-	1	0.280	0.214	0.172
The importance of physical and mental health	-	-	-	1	0.240	0.147
The satisfaction of participating in physical activities: sports, fitness, walking	-	-	-	-	1	0.464
Participation in physical activities: sports, fitness, walking	-	-	-	-	-	1

Conclusions

Most students of Babeș-Bolyai University, practice physical activity in their leisure time, the study revealing that motivation is, among other things, their importance in the health sphere. So, young demonstrates awareness of the beneficial effects of exercise on the body and psyche. In addition, it maintaining optimal health and gives them personal and social satisfaction. The values of correlation coefficients indicate that there are significant correlations between behaviors to practice physical exercise and perception of the effects of its value for himself.

REFERENCES

Alber, J., Köhler, U. (2004). Health and care in an enlarged Europe, Luxembourg, Office for Official Publications of the European Commission. Electronic version. Available online la *http://www.eurofound.europa.eu/pubdocs/2003/107/en/1/ef03107en.pdf.*

Baumeister, R.F., Campbell, J.D., Krueger, J.I. & Vohs, K.D. (2003). Does high selfesteem cause better performance, interpersonal success, happiness, or healthier lifestyles? Psychological Science in the Public Interest, 4, 1-44.

Ómarsson, Birgir Páll (2013). Thesis. Submitted in a partial fulfillment of the requirements of the BSc Psychology degree, Reykjavík University.

Braconnier A. (2007). «Introduction», in *L'adolescence aujourd'hui*, ERES, p. 7-10. URL: *www.cairn.info/l-adolescence-aujourd-hui--978274920509-page-7.htm*

Carter N. (2012). Medicine, Sport and the Body. A Historical Perspective, Bloomsbury Chapter p.13–35. DOI 10.5040/9781849662062.ch-001

Heatherton, T.F. & Helb M.R. (1998). Body Image. Encyclopedia of Menthal Health, vol. 1, pp. 257-266, Academic Press.

Nordqvist C. (2013). Medical News Today. *http://www.medicalnewstoday.com/articles/150999.php.*

Pawłucki A. (2014). Physical Culture and Sport. Studies and Research. Volume 61, Issue 1, Pages 15–27, ISSN (Online) 1899-4849, ISSN (Print) 2081-2221, DOI: 10.2478/pcssr-2014-0002.

Pop C.E. (2010). Starea de sănătate a populației din românia în context european. O abordare din perspectiva calităţii vieţii. Calitatea vieţii, XXI, nr. 3–4, pp. 274–305.

Volkwein-Caplan K.A.E., Volkwein K.A.E. (1998). Fitness as Cultural Phenomenon. Waxmann Verlag.

Witmer, L., Bocarro, J.N. & Henderson, K. (2011). Adolescent Girls' Perception of Health within a Leisure Context. Journal of Leisure Research; Vol. 43, No. 3, pp. 334-354.

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INTELLIGENT DECISION MAKING TOOL FOR AIDING THE SETTING OF OPTIMAL INTENSITY IN AEROBIC ENDURANCE TRAINING

ADRIAN PĂTRAŞCU[1*], MONICA PATRASCU[2], IACOB HANŢIU[1], REMUS CRISTIAN VĂIDĂHĂZAN[1]

ABSTRACT. Aerobic endurance training plays a significant part in the field of physical activity due to the fact that it has a medium intensity value and it depends primarily on aerobic energy generating processes. By engaging the cardiovascular and respiratory systems of the body this type of training is used to improve the overall endurance and fitness. The adaptation of these structures to the physical effort results in improving the performance output, by pushing the limits of cardiovascular and respiratory system's functions. In order to obtain the desired results it is necessary to ensure the operating points that are often hard to reach by classical training methods. The human heart rate variability with respect to the velocity of walking or running presents inherent nonlinearities that are required to be taken into account when designing computer integrated training aids. This paper implements a training aiding tool for setting the optimal intensity of the training, using an intelligent decision making system for the human cardiovascular fitness. This software application was tested and validated by using pre-recorded data from various subjects and was compared to the classical way of analysing the heart rate variability of a subject. The designed intelligent decision making tool ensures the optimal desired intensity profiles, finding its usefulness in supporting the training configuration process by specialized professionals.

Keywords: *intensity, aerobic endurance, training, intelligent system*

REZUMAT. ***Instrument decizional inteligent pentru determinarea intensităţii optime în antrenamentul de rezistenţă aerobă.*** Antrenamentul pentru rezistența aerobă poartă un rol important în aria activităților fizice datorită valorii medii ale intensității care activează, în principal, procesele aerobe energogene. Prin

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angrenarea sistemelor cardiovascular şi respirator, acest tip de antrenament este utilizat pentru dezvoltarea anduranței generale. Adaptarea acestor sisteme la efortul fizic, care are ca rezultat creşterea performanței, este realizată prin continua forţare a funcțiilor sistemelor cardiovascular şi respirator. Pentru a se obține rezultatele dorite este necesar să se asigure puncte operative obiective din punct de vedere fiziologic, lucru care este mai greu de realizat prin metodele de antrenament clasice. Variabilitatea frecvenței cardiace prezintă nonliniarități inerente, în ceea ce privește viteza mersului sau a alergării, care trebuie luate în considerare în conceperea instrumentelor pentru antrenamentele asistate de calculator. Această lucrare implementează un instrument decizional de asistare pentru setarea intensității optime a antrenamentului, utilizând un sistem inteligent de luare a deciziilor. Testarea şi validarea acestei aplicaţii au fost realizate prin utilizarea unor date înregistrate anterior; totodată s-a efectuat şi compararea acestui instrument cu metoda clasică de analiza a variabilității frecvenței cardiace. Instrumentul decizional inteligent asigură stabilirea profilelor optime dorite pentru intensitatea antrenamentelor, găsindu-şi utilitatea în suportul acordat procesului de configurare a antrenamentului de către profesionişti.

Cuvinte cheie: *intensitate, rezistență aerobă, antrenament, sistem inteligent*

Introduction

The body undergoes multiple adaptations to the stress of an aerobic workout that allows optimal output of performance. The metabolic demands that appear as a result of muscle activity are one of the causes that generate an increased delivery of blood to working muscle groups and as a consequence an increased heart rate. One of the most common methods of improving the fitness of a person consists of maintaining their heart rate during the training at a set value that is unique for each individual. This set value is in close correlation with the previously settled intensity of the workout. The required heart rate is harder to be maintained by the subject if the intensity gets higher. The classic training methodologies for improving aerobic endurance work with in "off-line" way, meaning that the regulation of the intensity is made after the practice is over and the next practice will be arranged according to the information gathered during the previous one. This classical way of regulating the intensity of the training "off-line" can be improved by using applications to assist the trainer into taking a decision regarding the level of the next workout's intensity. The stress of a workout on a subject's body has a degree of subjectivity regarding the interpretation of the intensity's actual level. The ability to include in an objective instrument this personal way of describing the intensity of a workout could prove

to be invaluable to achieving the desired performance. These vague subjective values can be used in an intelligent decision making instrument using a type of logic that can incorporate non-crisp values, called fuzzy logic. (Passino, 1998, Willmore 1999)

The integration of abstract knowledge from physiology into a fuzzy logic controller has been done with great success. The controller proposed by the author consisted of 36 *if-then* rules that were applied on a model that had three sets of variables (Jacobs, 1997).

Human decision-making can be modelled using fuzzy logic set theory by including abstract notions like human drives and motives, though there is a gap in the literature describing the methodology of creating expert-driven fuzzy logic models. The authors proposed a 10 step method that allowed them to include variables like motivation and drives into the controller (Rudas, 2012).

Novatchkov and Baca proposed an evaluation of strength exercises using the fuzzy logic approach. They also considered that there is a lack of application of fuzzy logic control systems in the fields of sport and training (Novatchkov, 2013).

Measurement of the beat-to-beat interval of the heart clearly shows that heart rate is not constant but alters from beat to beat. This is known as heart rate variability (HRV). At rest this beat-to-beat interval fluctuates with the breathing cycle – it speeds up during inhalation and slows down during exhalation.

This variation is due to the attenuation of the parasympathetic activity to the heart during inhalation. Heart rate is regulated predominantly by the autonomic nervous system (ANS). The ANS describes the nerves that are concerned with regulation of bodily functions; these nerves function without consciousness or volition. The autonomic nerves comprise sympathetic and parasympathetic nerves; sympathetic nerves excite the heart, increasing heart rate and parasympathetic nerves reduce heart rate.

Measurement of HRV for use in monitoring training and recovery involves analysis of the beat-to-beat variation. By accurately measuring the time interval between heartbeats, the detected variation can be used to measure the psychological and physiological stress and fatigue on the body during training. Generally speaking the more relaxed and unloaded (free from fatigue) the body is the more variable the time between heartbeats.

HRV data can indicate the impact of fatigue due to prior exercise sessions, hydration levels, stress and even the degree of performance anxiety, nervousness or other external stressful influences. Studies have shown that it varies within individuals according to size of left ventricle (inherited trait), fitness level, exercise mode (endurance or static training) and skill (economy of exercise). Body position, temperature, humidity, altitude, state of mood, hormonal status, drugs and stimulants all have an effect on heart rate and HRV as do gender and age. (Aubert, 2003)

Overtraining is an imbalance between training/competition and recovery. Additional non-training stress factors and monotony of training may also contribute to overtraining syndrome. While short-term overtraining can be seen as a normal part of athletic training (HRV does not seem to be affected) long-term overtraining can lead to a state described as burnout or overtraining syndrome. (Earnest, 2004)

Well-timed rest is one of the most important factors of any training programme. The effects of training sessions can be negligible or even detrimental if insufficient rest and recovery is built in. HRV measurements demonstrate a significant and progressive decrease in parasympathetic activity during long-term heavy training, which is followed by an equally significant increase during rest. Sympathetic activity shows the opposite trend. (Lehmann, 1993)

HRV is a relatively simple, but effective, tool for regular checks of progress during endurance training programmes.

Heart rate variability monitors and associated software are powerful tools for athletes and coaches, providing useful information which can be used to adjust training programmes to best effect.

Objectives

1. Designing an intelligent decision making tool for aiding the aerobic endurance training
2. Testing the decision making tool
3. Comparing it with the classical analysis of heart rate variability

Materials and methods

We've used a Polar Wearlink heart rate monitor to record all the data for this study, and analysed it using Microsoft Office Excel software.

To design the decision making application that included both the human-computer interface and the actual intelligent instrument that will analyse all the data provided we've used the Matlab 2008 programming software.

The application requires the previous measurement of two variables: the R-R interval (heart rate variability) and the work heart rate that was used during the last two training sessions.

For each of the variables the operator needs to input two entries: the "Reference R-R Interval", the "R-R Interval Before Session", the Work Heart Rate before the last session and the Work Heart Rate of the last session. After the data is given to the application the "Calculate" button can be pressed. This results in the calculation of the "Recommended Training Intensity" by the application. This

value of the intensity is presented in the form of a percentage that recommends how much the intensity for the next training should be changed. If the exit value is negative then the intensity should be lowered, and the opposite if the value is positive.

Subjects

For the testing and validation of the instrument we've recorded 4 subjects, all female, with the ages between 21 and 23 years old. We've recorded the subject's R-R intervals and also the heart rates of the training sessions during 13 days, because we need 10 entries to determine the Reference R-R Interval and the extra 3 were used in testing and comparing the application.

Results

After we collected the measured data for each of our subjects we analysed them using Excel. The first two subjects were the ones we've used our application on. The data from the other 2 subjects was used to see compare our application with the classical interpretation of the heart rate variability.

Table 1. Recordings of R-R Interval and the Reference Calculation

	Subject 1	Subject 2	Subject 3	Subject 4
Day 1	5.77	5.66	6.01	5.12
Day 2	6.05	5.40	5.89	5.15
Day 3	6.32	5.12	5.80	5.22
Day 4	6.67	5.90	5.99	5.30
Day 5	6.71	5.34	6.10	5.40
Day 6	6.65	5.70	6.15	5.39
Day 7	6.32	5.55	6.00	5.19
Day 8	6.10	5.41	6.14	5.64
Day 9	6.79	5.30	5.88	5.29
Day 10	6.13	5.10	5.94	5.25
Average	6.35	5.45	5.99	5.30
Standard deviation	0.34	0.26	0.12	0.15
Reference	6.01	5.19	5.87	5.14

Table 2. Recordings for the 11th, 12th and 13th day with Reference Calculation

	Subject 1	Subject 2	Subject 3	Subject 4
Day 11	6.44	5.21	6.12	5.14
Average	6.36	5.43	6.00	5.28
Standard deviation	0.33	0.25	0.12	0.15
Reference	6.03	5.17	5.88	5.13
Day 12	6.39	5.30	5.40	5.31
Average	6.36	5.42	5.95	5.28
Standard deviation	0.31	0.24	0.21	0.15
Reference	6.05	5.17	5.75	5.14
Day 13	6.50	5.19	5.80	5.27

Table 3. Evolution of R-R Interval and Reference

	Subject 1	Subject 2	Subject 3	Subject 4
Reference Before Day 11	6.01	5.19	5.87	5.14
Day 11	6.44	5.21	6.12	5.14
Reference Before Day 12	6.03	5.17	5.88	5.13
Day 12	6.39	5.30	5.40	5.31
Reference Before Day 13	6.05	5.17	5.75	5.14
Day 13	6.50	5.19	5.80	5.27

Table 4. The exit data for Subject 1 on the 3 evaluation days

	Subject 1		
WHR Two Sessions Ago	120.00	132.00	150.00
WHR Last Session	132.00	150.00	145.00
Recommended Intensity	4.50	3.20	12.00

Table 5. The exit data for Subject 2 on the 3 evaluation days

	Subject 2		
WHR Two Sessions Ago	120.00	124.00	136.00
WHR Last Session	124.00	136.00	140.00
Recommended Intensity	2.11	1.35	2.17

Discussion

The data we've collected after the analysis of the recorded variables allows us to show that using our application the optimal intensity can be adjusted according to individual needs. The evolution of the performance for the first two subjects reveals that the use of our software gives a more gradual and controlled way of setting the intensity of an aerobic training compared to the classical way of interpreting heart rate variability for the setting of the work load.

Conclusions

1. Out application uses well the information from the literature regarding the interpretation of the heart rate variability for setting the training's intensity
2. Out instrument allows a more gradual increase or decrease of the intensity
3. The integration of the previous training's work heart rates allows to better adjust the percentage with which to increase or decrease the intensity
4. This application opens the path to implement it into a larger control system for aerobic endurance training

REFERENCES

Aubert, A.E., Seps, B. & Beckers, F. (2003). Heart rate variability in athletes. *Sports Medicine*, 889-919.

Earnest, C., Jurca, R., Church, T., Chicharro, J., Hoyos, J. & Lucia, A. (2004). Relation between physical exertion and heart rate variability characteristics in professional cyclists during the Tour of Spain. *British Journal of Sports Medicine*, 568 – 575.

Jacobs, R. (1997). Control model of human stance using fuzzy logic. *Biological Cybernetics*, 63-70.

Lehmann, M., Foster, C. & Keul, J. (1993). Overtraining in endurance athletes: a brief review. *Medicine and science in sports and exercise*, 854-862.

Novatchkov, N. & Baca, A. (2013). Fuzzy logic in sports: a review and an illustrative case study in the field of strength training. *International Journal of Computer Applications*, 8-14.

Passino, K.M. & Yurkovich, S. (1998). *Fuzzy Control.* Addison-Wesley.

Rudas, I., Takacs, M. & Toth Laufer, E. (2012). Risk and uncertainties of physiological processes handled by the fuzzy implementation. *Latest advances in systems science and computational intelligence*, 37-42.

Willmore, J.H. & Costill, D.L. (1999). *Physiology of Sport and Exercise.* Human Kinetics.

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HEART RATE RECORDING SYSTEM FOR PARTICIPANTS TO WEIGHT TRAINING IN CLUJ-NAPOCA'S FITNESS GYMS (COMPATIBILITIES BETWEEN ANDROID AND WINDOWS 7)

REMUS-CRISTIAN VĂIDĂHĂZAN[1*], IACOB HANȚIU[1], NICOLAE HORAȚIU POP[2], ADRIAN PĂTRAȘCU[2]

ABSTRACT. Measuring the heart rate we can analyse the cardiac profile of a particular sport (Derevenco, 1998) and we can use the heart rate as a guide to plan our exercise intensity because it is in a direct linear relationship with oxygen consumption (American College of Sports Medicine, 2005). Using a heart rate monitor allows us to assess the dynamic changes that occur during physical activity in a heart rate profile (Burke & Polar Electro Inc., 1998). The system we use for our research include one cardiac monitoring belt, Polar brand, one smartphone with Bluetooth reception and specific software for analysis and the interpretation of heart rate data (SportsTracker Pro for Android and SportTracks for Windows 7). There are many systems that record heart rate during physical activity but their importance is given by the mobility that users have in terms of control and recorded data processing. We believe that the main advantages of our system are the high compatibility between system components and the high mobility to use and to transfer data from a software to another.

Key words: *heart rate monitor, Polar, Android, Microsoft Windows 7.*

REZUMAT. ***Sistem de înregistrare a frecvenţei cardiace la practicanţii antrenamentului cu greutăţi în sălile de fitness din Cluj-Napoca (compatibilităţi între platforma Android şi platforma Windows 7).*** Măsurând frecvenţa cardiacă putem urmări profilul cardiac al unei anumite activităţi sportive (Derevenco, 1998) şi putem folosi FC ca pe un ghid pentru a planifica intensitatea efortului deoarece ea este într-o relaţie liniară directă cu consumul de oxigen (American College of Sports Medicine, 2005). Folosirea unui monitor de frecvenţă cardiacă ne permite în fiecare moment să evaluăm modificările de dinamică a frecvenţei cardiace care au loc în timpul unei activităţi fizice (Burke & Polar Electro Inc., 1998). Sistemul folosit de noi pentru cercetarea desfăşurată în cadrul studiilor doctorale

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include centură de monitorizare cardiacă, marca Polar, un telefon (smartphone) cu funcţie bluetooth şi softuri specifice de recepţie, analiză şi intrepretare a datelor cu privire la frecvenţa cardiacă (SportsTracker Pro pentru Android şi SportTracks pentru Windows 7). Există multe sisteme care se folosesc pentru a înregistra frecvenţa cardiacă în timpul activităţilor fizice dar importanţa lor este dată de mobilitatea pe care o au utilizatorii în ceea ce priveşte controlul şi extragerea datelor înregistrate. Considerăm că principalele avantaje ale sistemului propus de noi îl reprezintă compatibilitatea ridicată între componentele sistemului şi mobilitatea mare de utilizare şi transferare a datelor în interiorul sistemului de la un program la altul.

Cuvinte cheie: *frecvență cardiacă, monitor, Polar, Android, Microsoft Windows 7.*

"Heart rate (HR) is one of the main functional parameters of the heart" (Derevenco, 1998, p. 40). It provides, in a simple manner, the most useful information about the amount of work that the heart does in order to satisfy the demands of a body involved in physical activity (Wilmore & Costill, 1999). Measuring HR we can assess the cardiac profile of a sporting activity (Derevenco, 1998) and we can use it as a guide to plan our exercise intensity because it has a direct linear relationship with oxygen consumption (American College of Sports Medicine, 2005).

Using a heart rate monitor allows us to evaluate changes of HR dynamics that occur during physical activity (Burke & Polar Electro Inc., 1998). We can use the monitor for HR to understand how the dynamics change, anticipating, how it will evolve during exercise, which makes our workouts more effective.

The first portable electrocardiograph, for periods of time up to 24 hours, appeared in 1961, made by Norman Holter (Holter, 1961 cited by Billman, 2011, p. 3). In 1983, Polar Electro invented the first wireless ECG (no cables between electrode belt and receiver): Polar Sport Tester PE 2000 (Parker, 2007). It began, thus, the period of HR portable monitors. They were developed continuously, modifying their performance in a very fast pace.

Such an apparatus is made by a ring electrode which will be positioned on the chest. These electrodes monitor the electrical activity of the heart and transmit information by radio signal to a receiver that calculates heart rate per minute. This receiver can be a device as the clock attached to the forearm, or can be any type of device (phone, tablet) which has Bluetooth and software specifically designed for decoding signals received. The best apparatus have the signal coded between belt and receiver in order to prevent interference by nearby devices (Parker, 2007). These devices that monitor the HR allow the user to have real-time readings of the device.

The system used in the research carried out for doctoral studies include cardiac monitoring belt, Polar brand, a smartphone with Bluetooth and specific software for reception, analysis and the interpretation of HR data. Specifically, the system consists of:

- Polar WearLink® + transmitter with Bluetooth® (Polar Electro, 2014) (Fig. 1)
- Samsung GalaxyNote 2 N7100 (Samsung Electronics Co. Ltd., 2014) (Fig. 2)
- Software operating on Android (Google Inc., 2014), SportsTracker Pro (SportsTrackLive, 2014) (Fig. 3)
- Software operating on Windows 7 (Microsoft Corporation, 2014), SportTracks (Zone Five Software LLC, 2014) (Fig. 4)

Fig. 1. - Polar WearLink® + transmitter with Bluetooth® (Polar Electro, 2014)

Fig. 2. - Samsung Galaxy Note 2, N7100 (Samsung Electronics Co. Ltd., 2014)

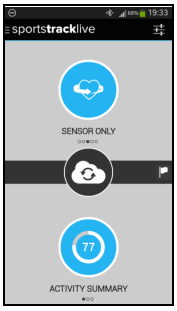


Fig. 3. - SportsTracker Pro (phone screen capture)

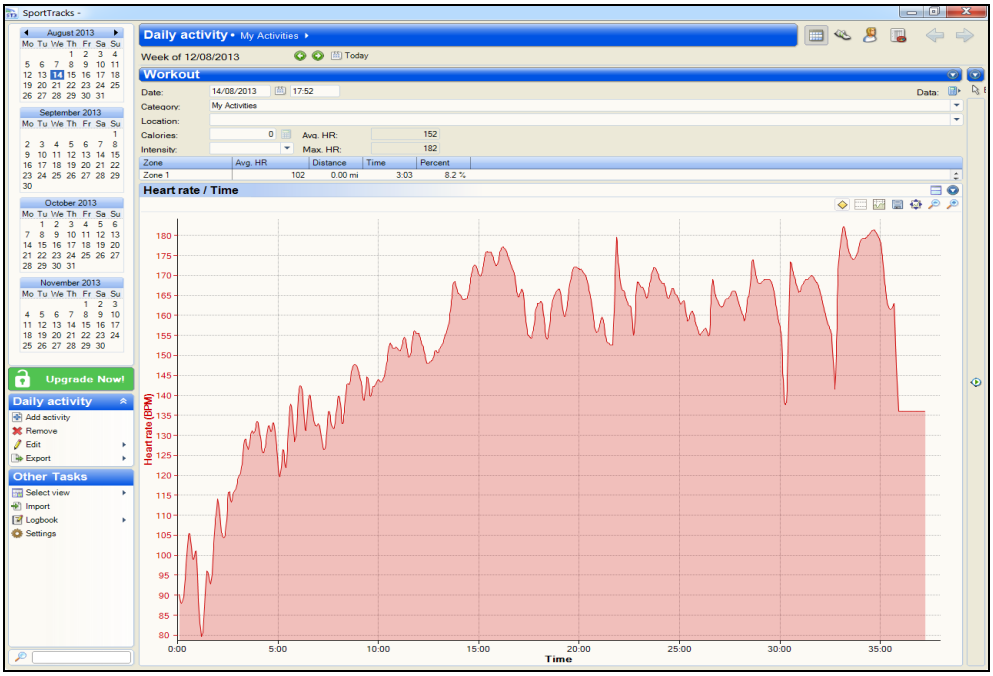


Fig. 4. - SportTracks (PC screenshot)

Polar HR monitor consists of a belt with electrodes which are attached to the chest and a Bluetooth transmitter that fits on the belt in the centre. The HR monitor sends specific parameters to the receiver that was paired with. The synchronization between the two is controlled by Android software and has a key consisting of "0000".

Electrode belt is fastened to the thorax practitioner after tapping the belt with water. It then performs the synchronization between the transmitter and the receiver by choosing the device "Polar iWL" (Fig. 5).

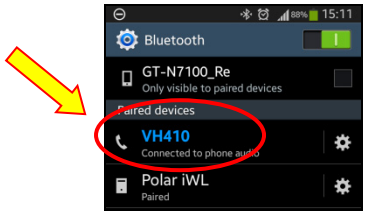


Fig. 5. - Bluetooth pairing

After making the connection between the HR monitor and the smartphone we can enter the personal data of the subject (sex, weight and age). To achieve this we have to access the "Personal" section in "Settings" (see Fig. 6).

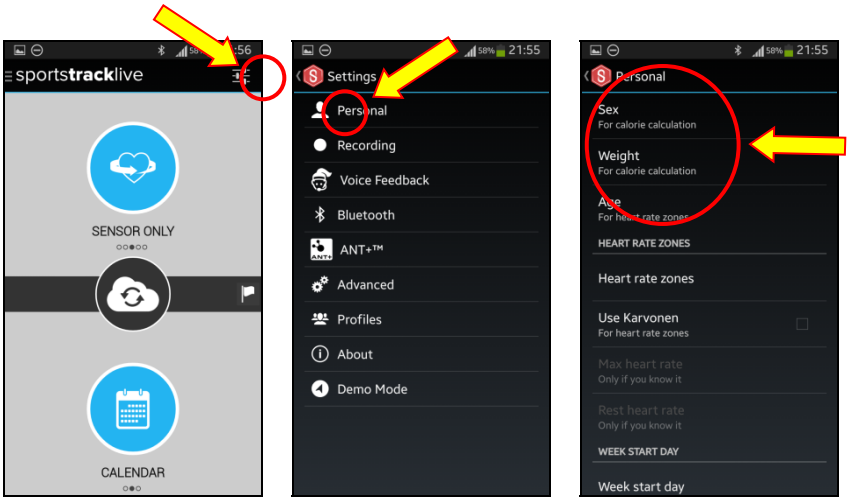


Fig. 6. - Setting personal data in SportsTracker Pro

After achieving coded pairing between the HR monitor and the software that will record the dynamic of HR, we begin monitoring the HR enabling the "Sensor only" feature (see Fig. 7).

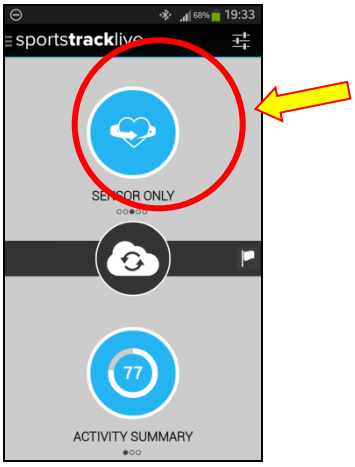


Fig. 7. - Enabling the recording

We have to wait for recording confirmation. Stable connection between the two devices is confirmed by the message "Connected" and the emergence of data on the smartphone display (Fig. 8). If we wait for a minute after the recording started the chances of erroneous fluctuations are very low. One minute after the data appeared on the display the researcher can start his/her counter. This allows perfect synchronization between HR recording data and observation notes. This synchronization is very important for further analysis based on the record sheet.

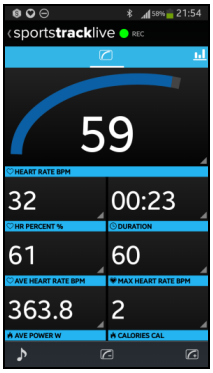


Fig. 8. - Records by SportsTracker Pro

At the end of the training data are stored by the phone software in separate sessions (Fig. 9). These sessions will be uploaded on the internet on the producer's page (Fig. 10).

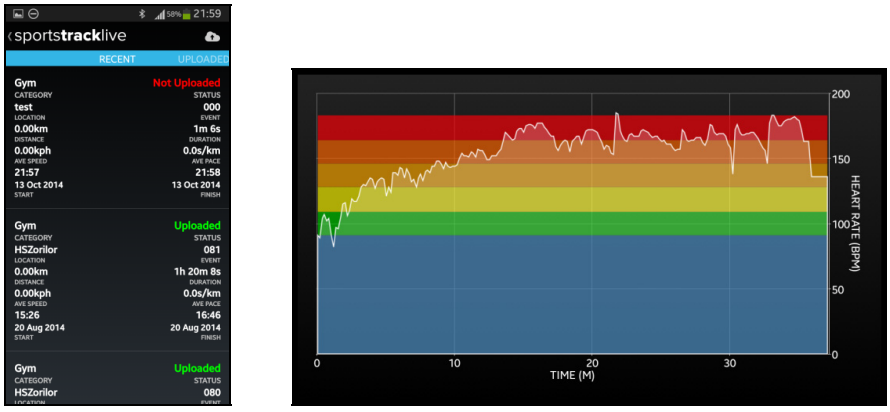


Fig. 9. - Training session recorded with SportsTracker Pro

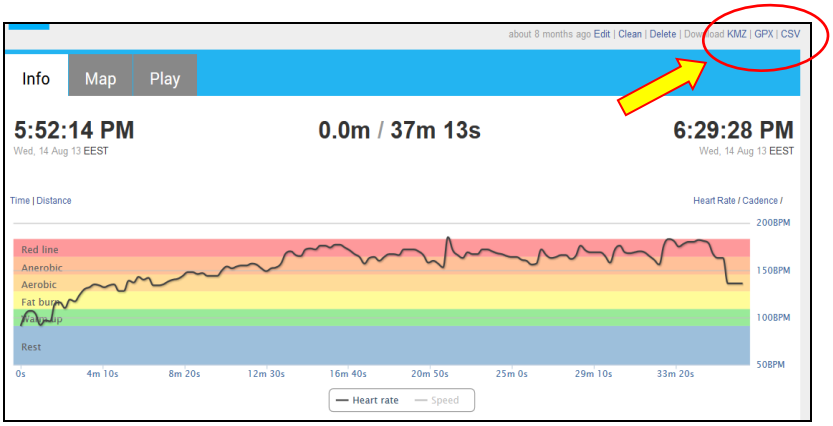


Fig. 10. - Training session viewed on the internet platform

To analyse in details the HR dynamics we have to download the file from producer's website. After that we can process the data on Windows 7 with SportTracks software. Data can be downloaded in three types of files: ".kmz" ".gpx", ".csv". Best format for analysis in this case is ".gpx". SportTracks for Windows 7 allows the import of HR .gpx file. This software allows, in fact, several file types for import: .gpx, .hrm, .fitlog, .pwx, .bdx, .csv, .xml, .hst, .tcx, .fit (see Fig. 11).

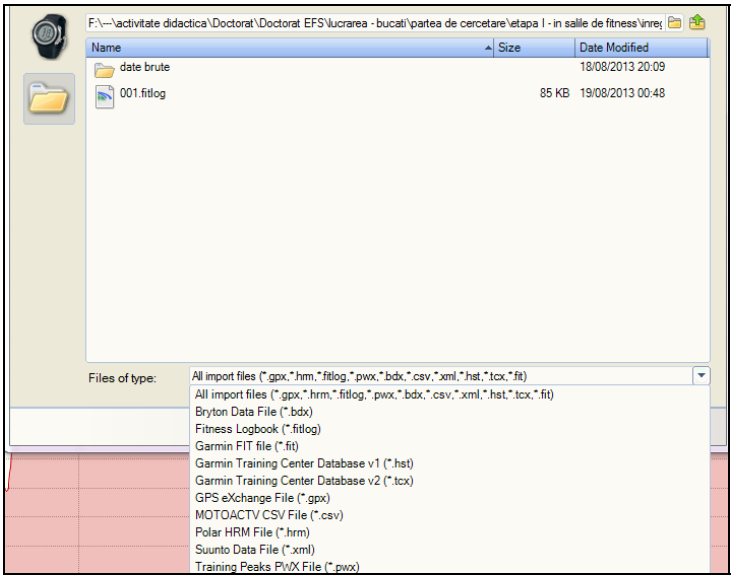


Fig. 11. - File types that can be imported by SportTracks for Windows 7

Analysis of the HR dynamics requires accurate recording of time (minutes and seconds) when every exercise starts and ends. For an accurate data analysis we need to access in SportTracks the "Splits" section (see Fig. 12). We select only the columns that we have a need for (enter the selection by using the right mouse button on the blue header) (Fig. 13 and Fig. 14).

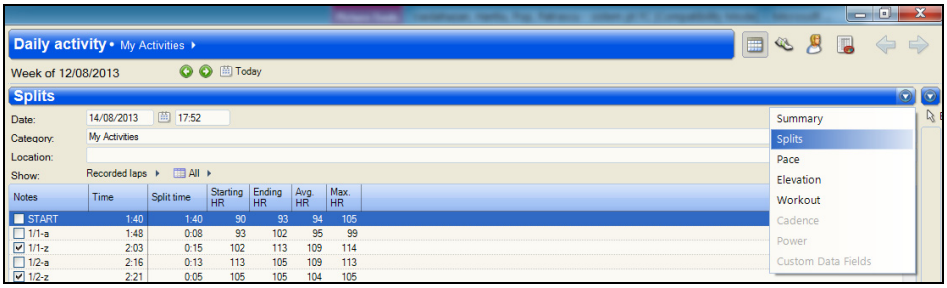


Fig. 12. - The "Splits"section

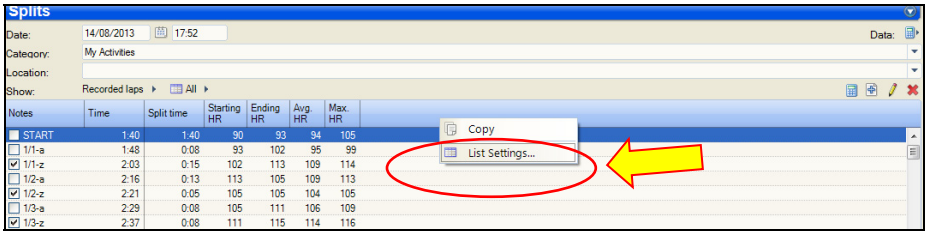


Fig. 13. - Enter the section for needed columns

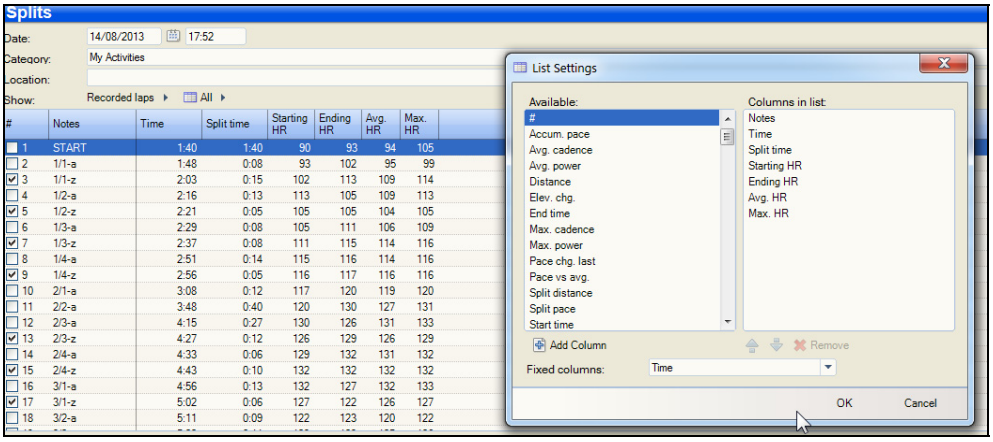


Fig. 14. - Choosing columns for the table header

After selecting the desired columns the data for each exercise can be inserted (Fig. 15 and Fig. 16). During recordings a specific coding was used: 1/1, 1/2, 2/1 etc. The first digit refers to the number of exercise and the second digit refers to the number of set for that exercise. To this coding we added two letters when the data was inserted in SportTracks "-a" and "-z" (where "-a" marks the beginning of the set and "-z" its end). This approach has facilitated the observation of dynamic for every exercise recorded without the need to modify the codes used in the observation sheet (for codes in observation sheet, see Fig. 17).

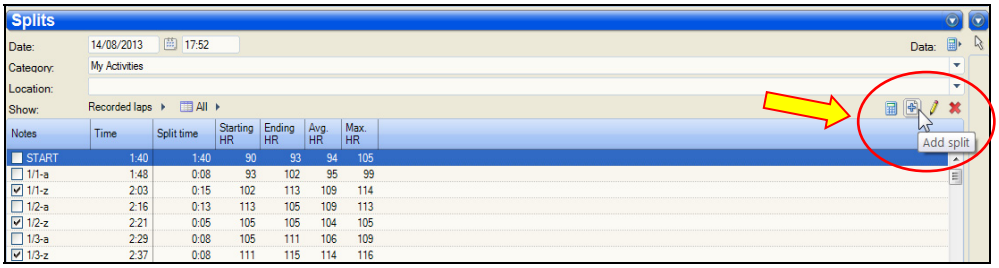


Fig. 15. - Opening a window to insert the data recorded

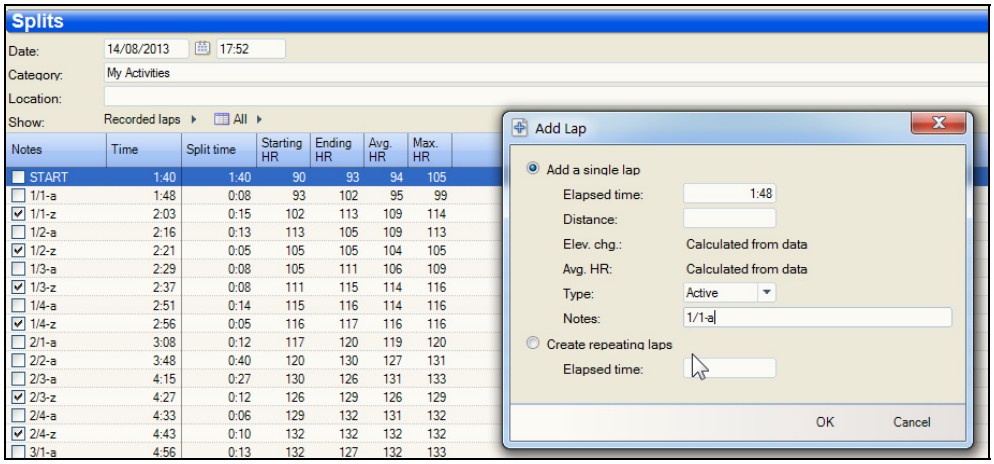


Fig. 16. - Inserting the recorded data in SportTracks

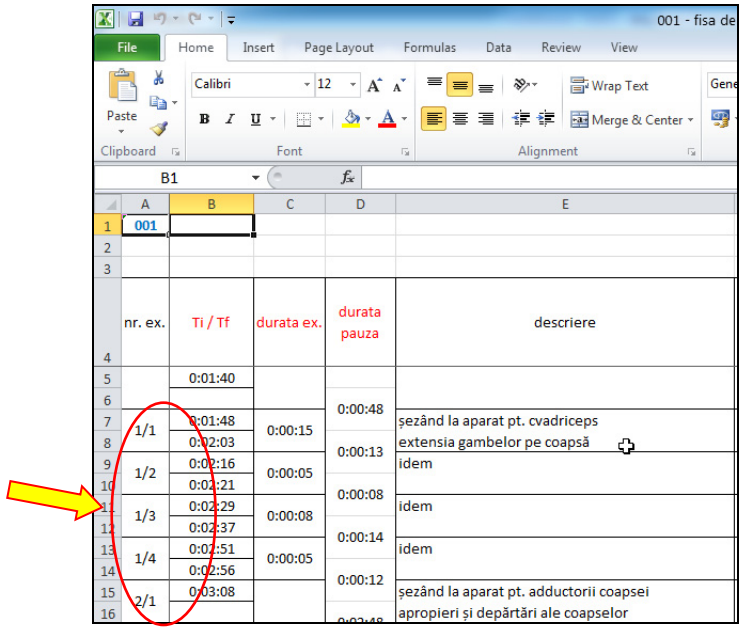


Fig. 17. - Codes in an observation sheet

After entering all the exercises in SportTracks it is possible to copy data into Microsoft Excel using the right button of the mouse, applied in the data field (Fig. 18 and Fig. 19).

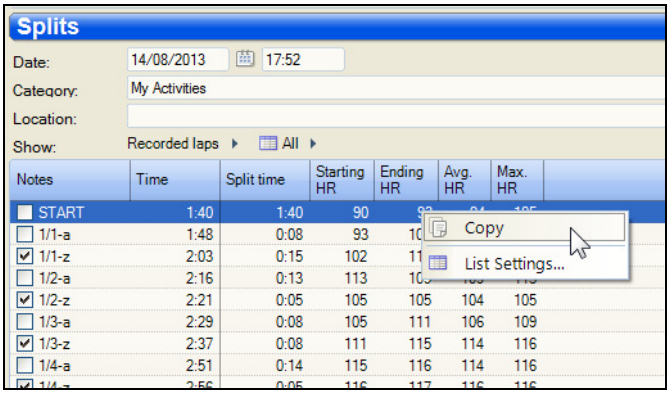
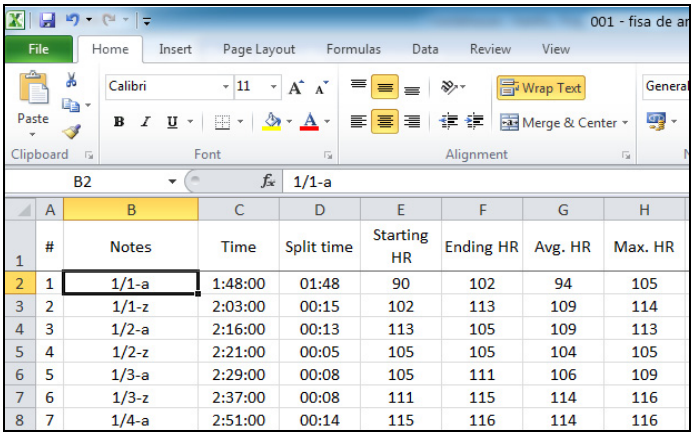


Fig. 18. - Copying data from SportTracks



	A	B	C	D	E	F	G	H
1	#	Notes	Time	Split time	Starting HR	Ending HR	Avg. HR	Max. HR
2	1	1/1-a	1:48:00	01:48	90	102	94	105
3	2	1/1-z	2:03:00	00:15	102	113	109	114
4	3	1/2-a	2:16:00	00:13	113	105	109	113
5	4	1/2-z	2:21:00	00:05	105	105	104	105
6	5	1/3-a	2:29:00	00:08	105	111	106	109
7	6	1/3-z	2:37:00	00:08	111	115	114	116
8	7	1/4-a	2:51:00	00:14	115	116	114	116

Fig. 19. - The data recorded for each exercise copied to Microsoft Excel

HR values recorded during exercise are on the rows which contains the encoding "-z". With all necessary data entered into Microsoft Excel the opportunities to use them for statistics are manifold.

SportTracks allows analysis of the HR dynamics in any area of the chart by an easy selection of areas of interest. The program will display the extreme values (beginning and end) and the average of selected surface (Fig. 20).

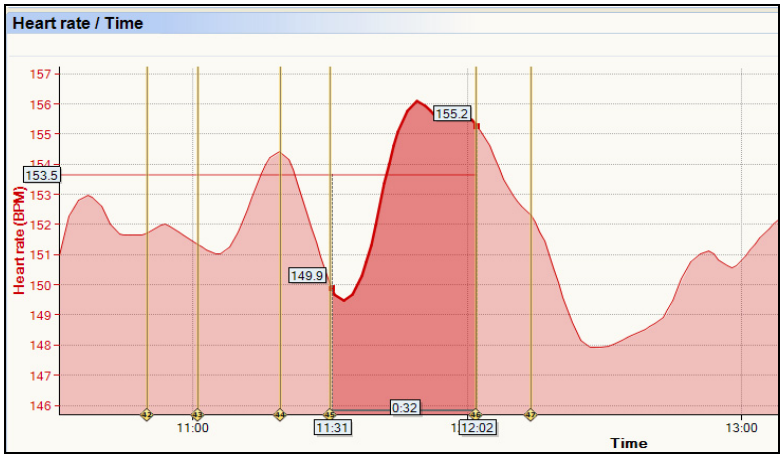


Fig. 20. - Analysis of a single zone in SportsTracker Pro

There are many systems that are used to record the dynamics of HR during physical activities, but their importance is given by the mobility that users have in terms of control and analysis of data recorded. The proposed system in

this case is used for over a year and has allowed, so far, the use of data in all forms needed for research.

We believe that the main advantages of the proposed system are the high compatibility between system components and a high mobility of data usage and data transfer within the system from one software to another.

Acknolwdgements

This content is subject to a Ph.D. research conducted in the field of Human Motricity Sciences.

REFERENCES

American College of Sports Medicine. (2005). *ACSM's Guidelines for Exercise Testing and Prescription - Seventh Edition.* Statele Unite ale Americii: Lippincott Williams & Wilkins.

Billman, G.E. (2011, November 29). *Heart Rate Variability – A Historical Perspective.* Retrieved January 27, 2013, from *www.frontiersin.org*: *http://www.frontiersin.org/Journal/DownloadFile.ashx?pdf=1&FileId=1969&articleId=16984&Version=1&ContentTypeId=21&FileName=fphys-02-00086.pdf*

Burke, E.R. & Polar Electro Inc. (1998). *Precision Heart Rate Training.* Statele Unite ale Americii: Human Kinetics Publishers.

Derevenco, P. (1998). *Elemente de fiziologie ale efortului sportiv.* Cluj-Napoca: Editura Argonaut.

Google Inc. (2014). *Android*. Retrieved aprilie 29, 2014, from android.com: *http://www.android.com/*

Microsoft Corporation. (2014). *Explore Windows 7 features*. Retrieved April 29, 2014, from microsoft.com: *http://windows.microsoft.com/en-us/windows7/products/features*

Parker, S. (2007, November 6). *History of Heart Rate Monitors.* Retrieved January 27, 2013, from *www.articlesbase.com*: *http://www.articlesbase.com/health-articles/history-of-heart-rate-monitors-253755.html*

Polar Electro. (2014). *Polar WearLink®+ transmitter with Bluetooth®*. Retrieved May 2, 2014, from polar.com: *http://www.polar.com/en/products/accessories/Polar_-WearLink_transmitter_with_Bluetooth*

Samsung Electronics Co. Ltd. (2014). *Samsung GALAXY Note II*. Retrieved May 2, 2014, from samsung.com: *http://www.samsung.com/global/microsite/galaxynote/note2/index.html?type=find*

SportsTrackLive. (2014). *Android*. Retrieved May 2, 2014, from sportstracklive.com: *http://www.sports-tracker.com/*

Wilmore, J., & Costill, D. (1999). *Physiology of sport and exercise - 2nd edition.* Statele Unite ale Americii: Human Kinetics Publishers.

Zone Five Software LLC. (2014). *SportTracks 3 Features*. Retrieved May 5, 2014, from zonefivesoftware.com: *http://www.zonefivesoftware.com/sporttracks/features/?b1*

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POWERED LANDMARKS FORMING INTERNAL MODELS OF REPRESENTATIONS AND CALLING THEM THROUGH MENTAL TRAINING IN HANDBALL PLAYERS

ALEXANDRU ANDREI GHERMAN[1*], LEON GOMBOŞ[1]

ABSTRACT. Mental training is enshrined as a method of self-regulation exercises concentrating attention and voluntary change of representation systems. It increases learning efficiency by optimizing the techniques, proofreading recovery after injuries and habituation competitive situations (Holdevici, Vasilescu, 1988). We started from the hypothesis that mental training in order to increase efficiency exceed the status of becoming a form of training method entirely based on "internal representation models" (Paillard, 1971) not only visual images but also reproduce kinesthetic, auditory and tactile. The representations are domestic ones reproducing mental images developed in the absence of external stimuli-visual (Miclea, 2003). Mental images are formed as a double-entry system: perceptions of the external environment and integrative cognitive system-internal environment. To prove this we have developed two tests that targeted training through the two-way representation, consisting of situational representations challenge the model handball court and activate perceptual representations made about the problematic situation (playing schemes) of handball. Analysis of response times from order to evoke record representation showed a positive correlation between the two paths. Mental images are formed more quickly by verbal stimuli that contain information about the shape and spatial configuration of technical and tactical procedures.

Keywords: *mental training, representations, mental pictures.*

REZUMAT. ***Repere acţionale în formarea modelelor interne ale reprezentărilor şi apelarea acestora prin antrenament mental la handbalişti.*** Antrenamentul mental este consacrat ca metodă de autoreglare prin exerciţii de concentrare a atenţiei şi modificare voluntară a sistemelor de reprezentări. Aceasta creşte eficienţa învăţării, prin optimizarea procedeelor tehnice, corectarea greşelilor recuperare după accidentări şi obişnuirea cu situaţiile competiţionale (Holdevici, Vasilescu 1988). S-a pornit de la ipoteza că antrenamentul mental pentru a-şi creşte eficienţa trebuie

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să depăşească statutul de metodă devenind o formă de antrenament integral bazat pe „modele de reprezentări interne" (Paillard, 1971) care nu reproduc numai imagini vizuale ci şi chinestezice, auditive şi tactile. De asemenea reprezentările sunt şi de natură internă reproducând imagini mentale elaborate în absenţa stimulilor externi-vizuali (Miclea, 2003). Imaginile mentale se formează ca un sistem cu dublă intrare: percepţii din mediul extern şi prin sistemul cognitiv integrativ-mediul intern. Pentru a demonstra acest lucru am elaborat două teste care au vizat formarea reprezentărilor prin cele două căi, constând în provocarea unor reprezentări situaţionale pe macheta terenului de handbal şi activarea reprezentărilor formate pe cale perceptivă prin situaţii problematice (scheme de joc) din handbal. Analiza timpilor de reacţie înregistraţi de la comandă la evocarea reprezentării au evidenţiat o corelaţie pozitivă între cele două căi. Imaginile mentale se formează mai rapid prin stimuli verbali care conţin informaţii despre forma şi configuraţia spaţială a procedeelor tehnico-tactice.

***Cuvinte cheie**: antrenament mental, reprezentări, imagini mentale.*

Introduction

Psychic phenomenon is mainly involved in mental training visual representation plus the kinesthetic auditory representation associated with attention, memory and other cognitive processes.

Representations of a problem epistemological movements as well as all types of representations. The psychological literature is recorded two major conceptions concerning mechanisms antagonistic representations.

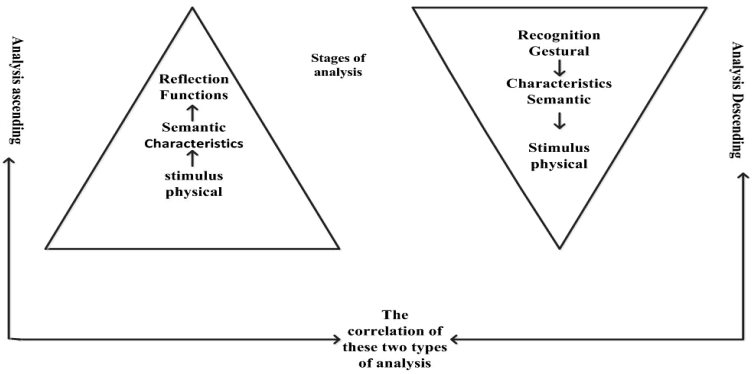

Fig. 1. Analyzes stages up and down the formation of representations

One of them claims that learning movements, controlling and planning of power stored representations take the form of diagrams. The second view argues that tests of control and coordination of movements taken from environmental constraints (Fleurance, 1991). So representations reflect these constraints. We appreciate that we have two ways of analyzing the movements (in handball, athletics, football, etc.) one ascending from the stimulus function and internal environment in which it is represented and the other from knowing a downward gesture external action.

Consequently representations are not possible unless sensorimotor actions and vertebralizarea (systematic) were internalized by attaching to their evocation schemes and facilitating conscious adjustment. Action is the incubation medium of representation. (Popescu, 1978)

The research purpose

We believe that the two forms of analysis upward from stimulus (observing a movement) and memory representation acquired imaging (on the one hand and analyze downward) from internal motivation and idea, on the other hand, leads to the formation of schematic representations through posting substantive motion appears blurred. The representation is in fact a dual input from the external environment and internal environment therefore constitute representation model as in Fig. 2.

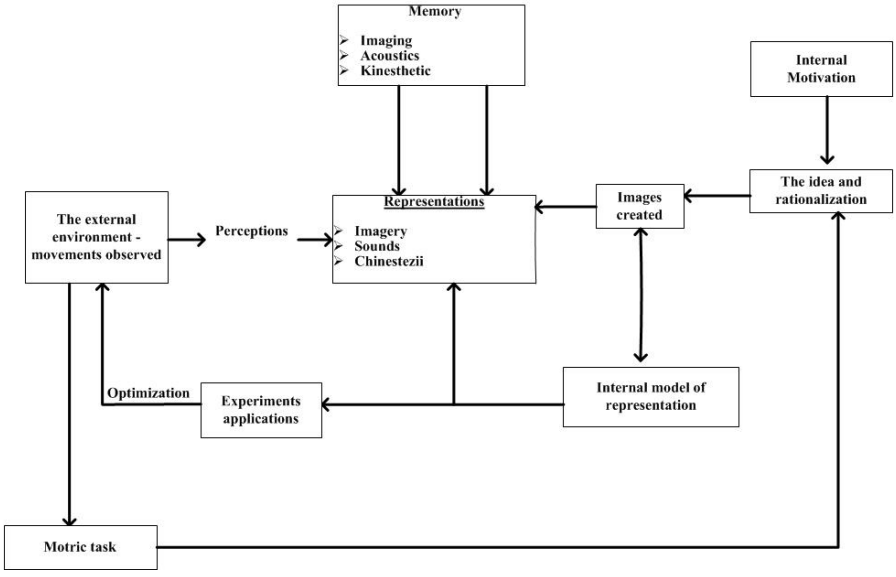

Fig. 2. The representation and mental imagery functions in closed loop and / or open depending on the situation

I found it necessary to prove through this research the relationship between the two embodiments of the representations in handball and necessary conclusions in forming images as clear and their evocation of mental training (Holdevici, 2010).

Models and research organization

To achieve the research purpose we developed two tests for assessing the informational content of some aspects of subjective interiority handball and transposition of the subjects investigated in the form of images (ascending analysis) and then anticlockwise from subjective to objective reality interiority (analysis downward).

Test No. 1 - analysis of ascending

It presents a scheme developed land subjects handball, which describes a phase of game where the attacking team has the ball to a player in a position to choose who to pass between two teammates in situations possible to throw the gate.

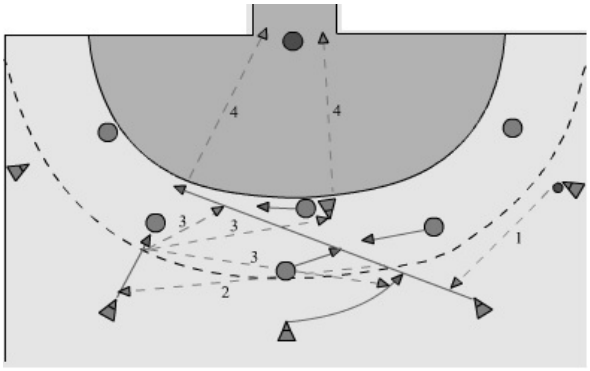

Fig. 3. Game draft with two possibilities of pass.

Subjects were asked to view the draft for 20 seconds after which they redesigned it from memory. The drawing was covered with paper and the experimenter called a player in attack or defense that the subject must also recall him saying the position is located. Pronounce words every 5 seconds. We measure the time from the signal (center, inter, etc.) to answer.

Test No. 2 - Analysis downward

It asks subjects to mentally explore a handball court and the environment in which it lies. On the ground runs a game. The subject is situated on the drawing to a position marked with X.

After the drawing, it is covered with a paper and experimenter pronounces the word designating a position on the drawing, and starting the timer. The subject responds with "I know" or "do not know" stopping the timer. It does so with all parts of the drawing. The tests were applied to all data subjects are organized in pairs.

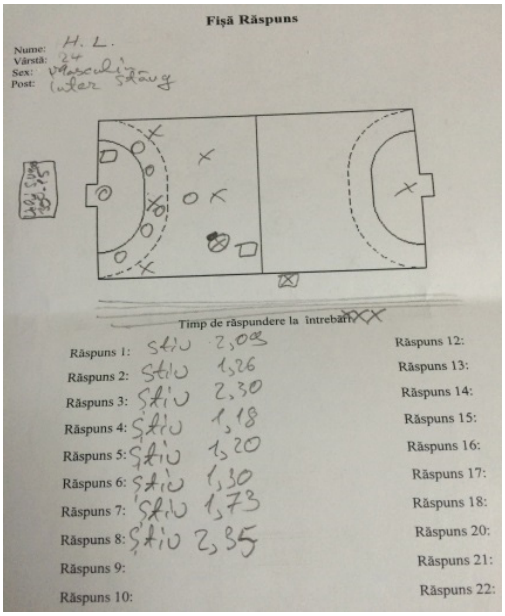

Fig. 4. Drawings of a subject

There were two training sessions (juniors and seniors) and two official games at senior and junior registering: marks and branding, wrong passes, interception actions were largely representations downward.

Subjects included in this research

Subjects were selected seniors, seniors and juniors after their operation on a desire to be included in this research. The sample investigated is as follows:

Table No. 1. Subjects

Category	**Nr. subjects**
Seniors	5
Senior	5
Junior	10
Total	**20**

Results

Reaction times collected by the two tests show the following:

In test no. 1 - seniors on representations after watching the tactical scheme are answers to 13 questions, reaction time values are between 0.90 seconds (STM – left back) and 4.08 seconds (ET – center back) value that can be considered non response.

Most answers are between 1-2 seconds. We appreciate that representations are well defined if and recognition time is reduced. Subjects with stroke between 1-1.5 seconds turned more effectively in training and action games with favorable placements.

It was found that the questions aimed at inner left and centers were answered in time longer than 2.60 seconds extremes and right inner, 3.71 seconds respectively 1.11 seconds – 2.50 seconds.

Values are similar in senior handball. We cannot consider that there are differences between the sexes on representations after watching the elaborate scheme.

We note responses in less time at the player's junior (16 years) between 0.71 seconds and 3.68 seconds. The five players have answered two or three questions, which highlights, on the one hand an observant less efficient and therefore lack clear representations. Synthetic can notice a revelation between speed image recognition by representation, the distance that lies teammates, opponents and spirit of observation.

No 2 test results seniors and all seniors have resulted in reaction times previous to question the recognition objectives recorded in drawings made by each subject. Reaction time between 1.50 seconds and 2.38 seconds.

Data is recorded and the players like juniors.

Recognition of images designated by each athlete and sports was achieved in a shorter time compared to storing images in test no. 1. We also appreciate that representations of drawings made by subjects did not have the clarity of viewing. Objectives drawn with greater clarity have led to clearer representations thereof. (Statements of subjects).

View that the two tests provides data on using images in explaining tasks in training but also in interruptions (time-out) to which they are entitled teams. An important condition is that they are accompanied by explanations short and precise players to form representations as clear.

Table Nr. 2 - Test No. 2 the reaction times obtained in the group of junior handball players, recognizing the objectives of drawing

Nr. Crt.	Name Post	Age Sex	Position in field	Teammates	Opponents	Coach	Referees	Bench	Table	Tribune Public	The ball	Mascots
1.	S.A. Centru	16 F	2,51	4,35	2,88	3,30	-	-	-	-	2,26	-
2.	F.A. Pivot	16 F	2,16	1,66	2,38	-	-	-	-	-	-	-
3.	F.A Extr. Dr.	16 F	2,23	2,35	1,83	1,78	1,85	1,78	-	-	2,65	3,48
4.	D.I Pivot	15 F	1,91	2,25	2,62	2,71	2,60	-	3,35	-	-	-
5.	C.M Extr. Stg.	16 F	1,86	1,01	2,53	2,30	1,43	-	2,30	-	-	1,98
6	R.D. Extr.	15 F	3,06	2,55	2,65	3,05	2,08	2,10	2,21	1,55	-	1,80
7.	C.C pivot	16 F	3,45	2,26	3,03	3,50	3,91	3,50	3,21	2,41	-	-
8.	G.A pivot	16 F	1,96	2,03	2,30	1,86	1,86	2,30	1,80	1,38	-	1,90
9.	R.D pivot	16 F	2,58	2,86	2,60	1,85	1,75	2,40	1,53	1,66	-	-
10.	P.R. Inter. Stg.	15 F	3,03	2,60	2,16	3,18	1,48	2,15	1,70	2,00		1,81

Conclusion

1. The representation of movement is established as a dual input that leverages two types of analysis, external and internal, ad hoc or enriching memory representations constituting imaging.

2. Test the analysis investigated the formation upward representations revealed that the retention of images under time pressure (maximum 20 seconds for observer) leads to the formation of blur, thus prolonging the time required for sharp observation.

3. Reaction time (recognition) of the signal protocol (abstract) Subjective image (representation) reflects its clarity with respect to target distance (player, lead, coach, etc.) from that which prepared the drawing.

4. Number of test questions no. 1 must not exceed the figure 14, referring to positions teammates and opponents.

5. Statistical analysis, particularly correlation between results of the two tests may reveal a close link between the two forms of analysis, ascending and descending.

REFERENCES

Cadopi, M. (1991). Role mentales des images dans la traction; in L'aprentissages moteur, Role des Representation. Edition revue E.P.S. Paris. (p.119)

Fleurance, P. (1991). Place des Representation roles et dans l'apprentissage moteur; in L'aprentissages moteur, Role des Representation. Edition E.P.S. revue, Paris. (p.81)

Holdevici, I. (2010). Psychology of Success, autosuggestion and relaxation. University Press. Bucharest. (p.231)

Mircea, M. (2003). Cognitive psychology. Polirom. Iaşi. (p. 26, 169)

Smith, P.N. (1978). Dictionary of psychology. Publisher Albatros. Bucharest.

Zlate, M. (2009). Foundations of psychology, Polirom, Iasi. (p.150)

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PROFESSIONAL COMPETENCES AND EXPERIENCE IN SPORTS AND RECREATIONAL AQUATIC FACILITY MANAGEMENT

ISTVÁN BALOGA[1*], SÁNDOR VIZI[1]

ABSTRACT. The present article is aimed to evaluate the current state and suggest new ideas within the management of the aquatic facilities in Romania, as compared to the management in the same industry in the United States of America. Identifying the educational degree of the aquatic facility manager, as well as examining the management activities that can contribute to the improvement of the aquatic facilities performance were the main goals of this study.

Key words: *Sports management, sports and recreational aquatic facilities, swimming, professional competence, performance.*

REZUMAT. ***Competenţe profesionale şi experienţa în managementul bazelor acvatice sportive şi de recreere.*** Această lucrare are ca scop verificarea stării actuale şi propunerea unor idei noi în domeniul managementului bazelor acvatice din România, comparativ cu managementul din acelaşi sector de activitate din Statele Unite ale Americii. Identificarea domeniului de învăţământ absolvit şi experienţa managerului bazei acvatice, precum şi examinarea activităţilor manageriale ce pot contribui la creşterea performanţei bazelor acvatice au fost principalele obiective urmărite în acest studiu.

Cuvinte cheie: *Management sportiv, baze acvatice sportive şi de recreere, natație, competenţe profesionale, performanţă.*

Introduction

Sports managers admit that sports facilities influence the organization in several ways. First of all, the number, type and quality of the sports programs and activities are directly influenced by the available facilities. Second, the quality of the sports facility is a direct reflection of the organization and its programs. Third,

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the sports facility represents an important advantage for the organization, which can affect in a positive or negative manner the revenue generation, the brand image and the customer satisfaction (Covell et al., 2003).

Objectives

- Establishing the role and usefulness of the aquatic and recreation facilities management, as well as examining the management activities that can contribute to the improvement of the aquatic facilities performance.
- Analyzing the activities of the aquatic facilities in Romania and comparing them with those in the United States of America.

Starting from these objectives, our study tries to establish interdisciplinary connections between the management field and that of sports and to provide solutions for the improvement of aquatic facilities performance. We hope that the results of our research, in a field too less addressed in Romania, will manage to contribute to the completion of the scientific literature and will provide support to the managers who lead the aquatic and recreation facilities.

We have tried to combine the information regarding aquatic activities and management activities and to find the ways that allow the optimization of aquatic facilities management and development of the programs they provide. Our study focused not only on the similarities and differences between the activities of aquatic facilities in Romania and the United States of America but also on the examination of professional certifications and work experience of managers leading the aquatic facilities.

Empirical research on the aquatic and recreation facilities management

The empirical research includes the research methodology, the study hypothesis, establishing the subjects and elaborating the surveys (in Romanian and English). Subsequently, we proceed to processing the data and interpreting them as well. Thus, based on the results obtained, we have tried to evaluate the activities of the aquatic facilities management in Romania.

Usually, a study has a goal, followed by addressing a research question or by testing a hypothesis. Formulating questions helps us guide the research process. The questions can originate from several sources including theories, observations, experience or from mere curiosity (Palys, 1997). In our research, we have established the following hypothesis: Professional competences and experience influence the holding of leadership positions within the aquatic facilities.

Establishing subjects and elaborating the survey

Within our research we have selected the aquatic facilities in Romania and the United States of America. This selection is due to the fact that in the United States of America there is a well-known tradition in the organization system of aquatic facilities and training programs for professionals in this field since 1914 by means of the resources provided by the American Red Cross. The personal experience in this field of many years of professional activity in the two countries contributed as well to the accomplishment of this research.

The American Red Cross teaches CPR and first aid courses to approximately 16 million people annually (ARC, 2010). Our wish is to take as a model the American system characterized by customer safety and satisfaction, but also by providing various aquatic programs in the sports branches where the USA excels when it comes to major sporting events (World Championships, Olympic Games). The comparative study deals with the management of aquatic and recreation facilities in Romania and abroad.

According to our investigation regarding the centralized situation of the swimming pools, we have relied to information provided by the National Institute of Statistics, the Romanian Swimming and Modern Pentathlon Federation, as well as the Romanian Water Polo Federation. As a consequence, we have learned that in Romania, in 41 counties and Bucharest there are 167 swimming pools, out of which 152 are functional. Our research aimed at analyzing the aquatic facilities, with a 93,33% coverage, in 9 counties: Arad, Bihor, Bistrița Năsăud, Brașov, Cluj, Harghita, Mureș, Satu Mare, Sălaj and Bucharest. The research at the swimming pools in the United States of America confined to aquatic facilities in 3 states: New York, New Jersey, Connecticut, with similar activities to those in Romania, in which there were from 1 to 7 swimming pools included (at each sports facility).

We have used two surveys in our research, both edited in Romanian and English: one survey was addressed to managers and the other survey was addressed to customers. The survey provides us with a quantitative or numerical description of the tendencies or attitudes of a population we are interested in (Creswell, 2003).

Therefore, the managers from different aquatic facilities have been surveyed, from 26 years old to 62 years old, 72,85% of whom were males and 27,15% were females. At customer level, the people that have been surveyed, were from 18 years old to 83 years old, 44,9% of whom were males and 55,1% were females (Table 1).

Table 1. Number, age and gender of the surveyed people

	Number of those surveyed	Minimum age (years)	Maximum age (years)	Females (%)	Men (%)
Managers	24	26	62	27,15	72,85
Patrons	156	18	83	55,10	44,90

For processing the results of the surveys we have used the SPSS 14.0 statistic program and Microsoft Office Excel 2007.

Testing the hypothesis and interpreting the results

While analyzing the research hypothesis, considering the relationships between the investigated phenomena, we have performed descriptive and comparative analyses for obtaining more eloquent results.

According to the results, we can observe a better professional qualification of the managers in the United States of America as compared to the managers in Romania, both from the point of view of the certifications achieved, but also from the point of view of the work experience in the field.

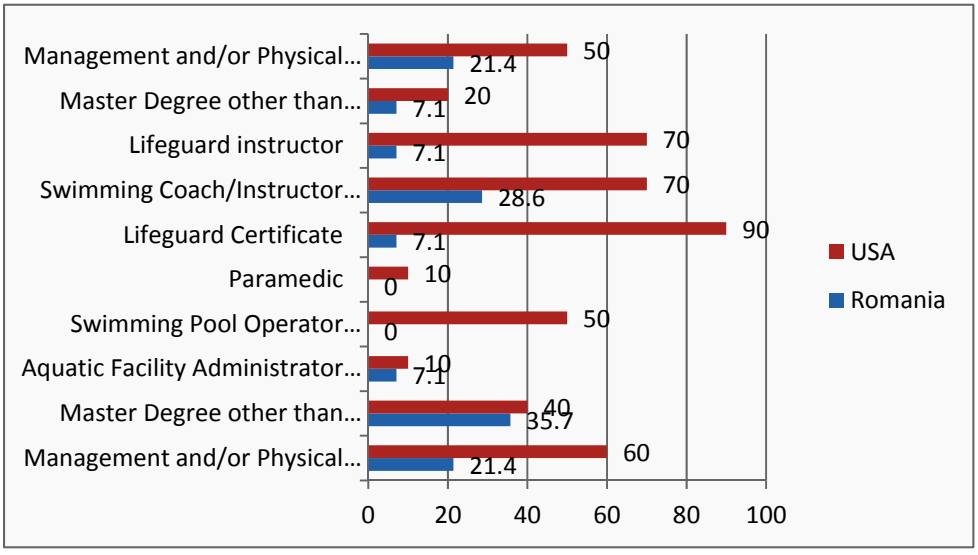

Figure 1. Education degree of the aquatic facility manager (percentage)

A value of the significance threshold under 0.05 can be observed when studying the experience in the work field as a manager, but also when it comes to the number of diplomas and certifications achieved by the managers of the aquatic facilities of the two countries studied. In order to be able to make the comparison, we have used the analysis of variance (ANOVA). The managers of swimming pools in the USA hold an average number of 4,1 diplomas and certifications in the field and 19,9 years of work in the field, 14,6 of which holding a management position, while, in Romania, the managers of the swimming pools have achieved an average number of 0,9 diplomas and certifications and have a work experience in the field of 7,7 years, 5,8 of which in a management position (Figure 2). Therefore our hypothesis confirms that professional competences and experience influence the holding of leadership positions within the aquatic facilities.

Table 2. Experience of the aquatic facility manager in this field – averages (ANOVA analysis)

	Romania	**USA**	**Significance (p)**
The average number of the manager's diplomas and certifications	0,9	4,1	0,000
The average number of years since the manager is working in this field	7,7	19,9	0,001
The average number of years spent working as manager in this field	5,8	14,6	0,009

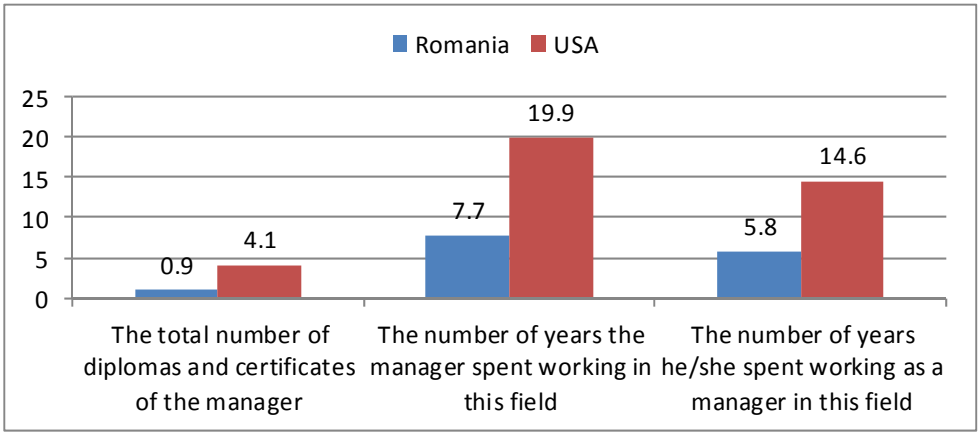

Figure 2. Experience of the aquatic facility manager in this field (comparison in Romania and USA)

The comparative study between the aquatic facilities in Romania and those in the United States of America has confirmed, from the point of view of the research hypotheses, certain differences regarding the management of these sports facilities, as follows:

- Managers in the United States of America have a professional qualification not only from the point of view of the diplomas obtained, but also from the point of view of the work experience in the specific field, which is better than the one of the managers in Romania. This is why it would be recommended for the aquatic facilities to organize management courses, as well as certain courses to obtain lifeguard certificates, recognized also abroad, in partnership with international organizations.
- The personnel in the aquatic facility should do everything necessary in order to keep up to date in their profession as sports facility managers. Therefore, it would be recommended for them to attend national and international meetings and conferences, to obtain the necessary certifications, to be up to date with the changes that take place within the personnel training programs and to be constantly looking for the best professionals available to work within the aquatic facilities they lead.
- We believe that is also essential to establish a national commission for accreditation and supervision of aquatic facilities operation.

Limits and perspectives of the research

Although the empirical research has been conducted at the level of a not very large sample because of financial limitation and difficult access to information related to these aquatic facilities, we are planning to extend the research in the future to a wider geographical spreading that would express a growth of the representativeness of the results within the present field of study.

As a perspective, we would like to conduct a similar comparative analysis between other countries of the European Union, which could provide essential information for the development of research within the sports management field.

REFERENCES

American Red Cross (2010). *Water safety instructor manual*, St. Louis, Mosby Lifeline.
American Red Cross (2012). *Swimming and diving,* St. Louis, Mosby Lifeline.
American Red Cross (2012). *Lifeguarding instructor's manual*, Boston, Staywell.

Baloga, I., Szatmári L., Pop, N.H., Ceontea, D.S. (2012). *Uszás-kurzus jegyzet*, UBB-FEFS-Uz Intern, UBB-FEFS, p. 20.

Chelcea, S. (2007). *Cum să redactăm o lucrare de licență, o teză de doctorat, un articol științific în domeniul științelor socioumane*, Bucureşti, Editura comunicare.ro.

Covell. D., Hess., P.W., Siciliano. J., Walker. S. (2003). *Managing Sports Organizations*, Thomson South-Western, Mason, OH.

Creswell, J.W. (2003). *Research design, Qualitative, quantitative, and mixed methods approaches*, Thousand Oaks, CA.

Dodescu, A., Pop Cohuț, I., Albu, I. (2004). *Metodologia Cercetării Științifice Economice,* Oradea, Editura Universității din Oradea.

Gabrielsen, M.A. (1987). *Swimming Pools: A guide to their planning, design and operation*, Human Kinetics, Champaign, IL.

Palys, T. (1997). *Research decisions: Quantitative and qualitative perspectives*, Toronto: Harcourt Brace, Canada.

http://193.231.1.3/file.php/5/ANOVAAuni.pdf, *ANOVA - Analiza de varianță*, accesat la data de 19 ianuarie 2014.

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STUDIES REGARDING INFLUENCE OF PHYSICAL TRAINING ELEMENTS SPECIFIC TO THE BASKETBALL GAME UPON OF MUSCLE TISSUE

IULIUS SORIN BĂRBUICĂ[1*]

ABSTRACT. Throughout a sports effort, the sportspeople's bodies are subject to many factors, either good or bad, which lead in many structural and functional changes in the organs and their functionality. Thus, one can meet a number of metabolic and enzymatic changes in the musculoskeletal, circulatory and respiratory systems. This paper presents some elements of physical preparation that are specific to the basketball game and the way they influence muscle tissue.

Key words: *muscle tissue, physical training, basketball game*

REZUMAT. ***Influenţa elementelor de pregătire fizică specifică jocului de baschet asupra metabolismului ţesutului muscular.*** În timpul efectuării unui efort sportiv organismul sportivului este supus unor multitudini de factori, benefici sau malefici, în urma cărora se produc numeroase modificări structurale şi funcţionale atât la nivelul organelor, cât şi la nivelul funcţionalităţii acestora. Astfel putem întâlni o serie de modificări la nivelul aparatului locomotor, circulator, respirator, la nivel metabolic şi enzimatic. În lucrarea de faţă sunt prezentate câteva din elementele de pregătire fizică specifice jocului de baschet şi modul cum influenţează acestea ţesutul muscular.

Cuvinte cheie: *ţesut muscular, pregătire fizică, jocul de baschet*

INTRODUCTION

Physical training is an element of athletic training that plays an important role in the whole process of training, ultimately establishing the sportspeople's performance in training and competitions. Physical training includes an entire

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system of measures ensuring the high functional capacity of the body, the high development of basic and specific motor qualities, the optimal values of the morpho-functional indices, the full control over the exercises, and a perfect health condition (Drăgan, 2002).

This paper presents some elements of physical preparation that are specific to the basketball game and the way they influence muscle tissue.

Physical training has two components: general physical training and specific physical training (Bărbuica, 2012).

a) General physical training ensures the development of the basic motor qualities (speed, force, resistance, mobility) and the functional capacities of the body in general; it improves the general motor resources; it ensures the harmonious development of the morphological and functional indices conditioning the basketball game (Bărbuica, 2012).

Basic physical training employs simple (less complex) means, large volume, low intensity and density.

It takes place at the beginning of the training period and is limited in time, in favour of the specific physical training it substitutes.

b) Specific physical training is primarily directed towards developing the effort capacity that is specific to a certain sports branch, as well as the motor qualities that are previously combined and differently involved in order to establish the ultimate specific performance. Specific physical training is achieved by means of strictly specialized means aimed at developing the previously established combinations of qualities required by the characteristics of the basketball game, the muscle groups involved in the effort, and the stress type (Bărbuica, 2012).

This type of physical training grows in importance after the first third of the training period, throughout the whole pre-competition period.

It continues to occur as specific exercise throughout the competition period.

Characteristics of physical training elements upon of muscle tissue

The basic assumption in physical training is that it is possible to develop and enhance all motor qualities, despite their different levels.

Physical training is also based on anatomical and physiological assumptions, coordination, regulation and conditioning abilities. Another issue concerns the intensity of exercise which depends on each motor quality. Consequently, the issue of developing the motor qualities cannot be approached in general but it requires different approaches for each motor quality. Thus, the following basic motor qualities can be distinguished: speed, force, resistance, skill and mobility (Drăgan, 2002).

SPEED

SPEED is the ability of the body to perform a certain movement or a series of movements in a short time. The shorter the time is, compared with other performances of the same motion, the higher the speed is.

There are several factors that influence speed, playing an important role in speed development. These are:

- muscle fiber type
- the capacity of alternanting nervous excitement and inhibition
- the level of neural network development
- muscle capacity to store energy-yielding substances (ATP, CP) the extent of the muscle section
- the bone and ligament system
- the biomechanics of the movement

The energy substrate in the speed efforts is particularly provided by the following energy-yielding substances: adenosintriphosphate (ATP), creatine phosphate (CP), muscular glycogen (Apostol, 1998).

In the basketball game the main efforts are measured by the anaerobic alactacid and lactacid capacities. The anaerobic capacities are tested under apnea or low ventilation conditions. Absence of oxygen generates energy. Depending on the energy-yielding substreate and the dominant metabolic manner, the anaerobic effort can be alactacid and lactacid (Georgescu, 2004).

The anaerobic alactacid effort is the physical effort occuring at maximum intensity in the absence of oxygen; the length of time for such an activity is maximum 5-7 seconds.

Consequently, the effort volume is minimum, as the muscle is able to perform only a few contractions of high intensity. In this effort, the neuromuscular system is the limitating biological factor. The muscular mass is that the nervous system involves in performance is directly proportional with the performance effort that implies the breaking of higher external resistance. The ATP stock contained in the microfibers is sufficient for an intense effort asting for 2-3 seconds, i.e. approximately 6mmols/kg. lean wet mass (Georgescu, 2004).

In order to continue the effort, ATP is quickly restored by a chemical reaction in which CP synthetizes about 20-30mmols/kg. lean wet mass. The energy released by this re-synthesis is sufficient for a high intensity effort lasting for 18-20 seconds. Thus, energy mobilization during the first 5-7 seconds is called the alactacid phase as it releses no lactic acid. Prolonged anaerobic efforts lead to the accumulation of lactic acid as a result of anaerobic glycolysis, since the oxygen demand required by intense exercise exceeds the oxygen supply level. When oxygen rate exceeds 60-80% of the maximum oxygen consumption, it is called anaerobic threshold (Georgescu, 2004).

The anaerobic lactacid effort is the physical effort with under-maximum intensity and a length of time between 7 and 60 seconds. The working volume is still low, as the energy released by the aerobic decompositions of glycogen allows an effort that lasts for approximately 40-60 seconds. Carbohydrates provide the energy substrate that allows ATP re-synthesis. Glucose or glycogen decompose by the process known as anaerobic glycolysis.

The lactic acid resulted from aerobic glycolysis and accumulated in muscles and blood produces significant local and general changes that negatively affect the subsequent effort. The exhaustion of the energy strate (ATP and CP) determines the end of the effort. In the predominantly lactacid performance, the accumulation of lactic acid id the main disturbing factor (Georgescu, 2004).

Speed development if mainly based on the following methods: repetition, signal performance, performance under easy and difficult conditions.

RESISTANCE

RESISTANCE is the capacity of the human body to perform mechanical work of a certain intensity for a long time, without losing efficiency under conditions of repressed fatigue. Resistance is directly dependent on the effort. Aerobic effort is physical exercise of constant intensity that lasts more than 3-5 main minute. The main feature of aerobic effort is reaching a constant level of oxygen consumption during the entire exercise, after an initial adjustment period varying between 3 and 5 minutes.

In this type of aerobic effort, the energy required for the performance is released by decomposing both liver glycogen and free fatty (unsaturated) acids. Transition from muscle glycogen consumption to liver glycogen consumption is marked by a specific condition of the body, generally known as 'dead point'.

The coverage of a large amount of energy by the fatty acids spares the muscle glycogen store, which, in this type of effort, should be the limiting factor. In sport training it is very important to know the sources of energy, i.e. the percentage of aero-anaerobic processes, in order to develop training programs that lead to their increase (Apostol, 1998).

In the basketball game, resistance effectively intertwines with strength and speed, representing the capacity of the human body to perform moderate intensity effort for a long period of time. This is one of the most perfectiblemotor qualities because it is determined by the development of the large functions and advanced specialist knowledge in the resistance development method. Resistance development during the game is based on the development means of general resistance as morpho-functional substrate for specific resistance (Dragan, I., 2002).

The correlation between the development of general and specific resistance presents a dynamics imposed by the concrete objectives of the training phases. Performance capacity is low when fatigue occurs as the use of a whole chain of structures exhausts the energy-producing substance and uimpedes liver synthesis of new substances able to support the work at the same level.

FORCE

FORCE is the capacity of the human body to overcome external or internal resistance by using muscle contraction. Force is determined by the following factors:

- the activity of nerve centres
- the level of cortex concentration
- the frequency of nervous impulses controlling muscle activity
- the number of fibers involved in the exercise
- the development level of the other motor qualities
- psychic factors: motivation, will, attention

Force development pre-supposes the application of a stimulus that should have a certain value in order to achieve a certain level of muscle tightness (Dragan, 2002).

SKILL

SKILL is the capacity to select and perform motor actions of high efficiency in a quick and correct manner under unpredictable circumstances. Skill is a form of complex performance expression by quickly learning new moves and fast adjustment to various situations, according to the basketball game specificities, or other basic and applied motor qualities. Basketball particularly requires kinaesthetic differentiation issues, spatial orientation ability, motor adjustment and re-adjustment capacity (Bărbuică, Moanţă, 2009).

The factors determining skill are:

- the type of muscle fiber
- the bone and ligament system
- the ability of the nervous system to coordinate neo-muscular processes
- the tonus and force of muscle chains
- muscle capacity to relax and lengthen

MOBILITY

MOBILITY determines the efficient performance of the technical procedures and other preliminary exercise or exercise aimed to acquire the basic and applied motor skills correctly. Efficiency actually refers to easiness, fluency, flexibility. In basketball, mobility is particularly important in special situations that require ample movement. All technical and tactical actions during the game cannot be efficient without good active and passive coordination (Bărbuică, Moantă, 2009).

CONCLUSIONS

- Basketball and its methods can have a multiple influence upon the performers' bodies.
- Muscles, ligaments, tendons, articulations, internal organs and the nervous system, i.e. the whole human body is put under varied pressure with each moment.
- Physical training provides energy resources for the performance by stimulating the increase in the functional and morphological indices (articulation and ligament strengthening, muscle development and training for performing mechanical work).
- Physical training stimulates the increase in motor qualities, enhancing the general effort capacity of the human body and the technical and tactical skills included in the regulations referring to the specific exercise in which the sportsperson is specialized.

REFERENCES

Apostol, I. (1998). *Energofiziologie* - Curs. Iaşi: Editura Univ. Al.I. Cuza.

Bărbuică, I.S. & Moantă, A. (2009). *Determinative relations between the structure of an actuating activity, number of repetitions, time of execution and performance achieved*. Lucrare prezentata la Sesiune Ştiinţifică Internaţională „Educaţia fizică şi sportul în contemporaneitate", Bucuresti.

Bărbuică, I.S., Moantă, A. (2009). *Objectives and assessment of the relationships between some of the tehnical, processes of basketball and motor skills that support their execution.* Lucrare prezentată la Sesiunea ştiinţifică internaţională „Educaţia fizică şi sportul în contemporaneitate". Bucuresti.

Bărbuică, I.S. (2012). *Învăţarea jocului de baschet*. Bucureşti: Editura Printech.

Drăgan, I. (2002). *Medicina sporivă*. Bucuresti: Editura medicală.

Georgescu, E. (2004). *Biochimia efortului sportiv în medicina sportivă aplicată*. Bucuresti: Editura Editis.

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THE PARENTAL INFLUENCE ON JUNIOR TENNIS PLAYERS

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ABSTRACT. This study has been made in order to better understand de role played by parents in obtaining tennis success by their children. In order to identify both positive and negative parental behaviours and strategies for maximising junior success by an efficient player-coach-parent triad. For reaching these goals a number of 14 junior tennis coaches in Cluj-Napoca answered a questionnaire. Results show that coaches think that parental involvement is crucial for success in junior tennis. Some principles related to the parental behaviour were identified as follows: the high expectations of parents because of the important financial investment, the opinion that tennis can produce a special parent-child relationship if correctly approached and the efficiency of parenting that enfacises virtues like fair-play or hard work, and not victory as the supreme goal. The coaches' answers enfacised the coaches' opinion that parents underscore victory and often have irrealistic expectations. On the other side, positive parental behaviour was related to the financial, logistic, social, emotional support and also to the sacrifices made by parents for providing opportunities for their children in order that they achieve success.

Keywords: *player-coach-parent relationship, parental role, junior, tennis, behaviour, strategy.*

REZUMAT. ***Influenţa părinţilor asupra jucătorului de tenis junior*****.** Acest studiu a fost efectuat pentru a înţelege mai bine rolul pe care părinţii îl joacă în obţinerea succesului în tenis. A fost alcătuit un eşantion format din antrenori de tenis de pe raza municipiului Cluj-Napoca pentru a identifica acele comportamente ale părinţilor care sunt eficiente şi a celor care sunt ineficiente, precum şi strategii pentru maximizarea succesului printr-un parteneriat între jucător, antrenor şi părinte. Pentru îndeplinirea acestor obiective, s-a aplicat un chestionar unui număr de 14 antrenori de tenis ai jucătorilor juniori din Cluj-Napoca. Rezultatele relevă faptul că antrenorii au calificat implicarea parentală ca fiind crucială pentru succesul în tenis. Au fost identificate şi unele principii referitoare la comportamentul părinţilor precum aşteptările ridicate ale părinţilor, dată fiind investiţia financiară importantă, eficienţa parentingului care nu pune accent pe victorie ci pe virtuţi precum fair-playul

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și munca asiduă sau opinia că tenisul, abordat corect, poate produce o relație părinte-copil specială. Răspunsurile la chestionar au evidențiat părerea antrenorilor că părinții subliniază prea mult importanța victoriei și deseori au așteptări irealiste. Pe de altă parte, comportamentele parentale pozitive s-au axat pe sprijinul oferit (financiar, logistic, social și emoțional) și sacrificiile făcute pentru furnizarea de oportunități pentru copiii lor astfel încât aceștia să poată să aibă succes.

Cuvinte cheie: *relație jucător-antrenor-părinte, rol parental, junior, tenis, comportament, strategie.*

Introduction

The role of parents in junior's tennis is now controversial. More and more coaches report problems regarding the behaviour of junior tennis players' parents and unintended negative effects on their child's sporting development. Meanwhile, the coaches recognize that many junior tennis players have parents who are very involved in the work of children and tennis players so they instilled virtues necessary for success in tennis. Their shared the view that most players cannot reach the top without support from their parents. However, paradoxically, parents are seen as essential for developing talent in tennis and simultaneously, a great detriment to some junior tennis players.

In Romania and the city of Cluj-Napoca there is little scientific research related to parenting issues in tennis. Therefore there is a significant need to study this branch of parenting and more specific, scientifically proven information on the identification of effective strategies and ineffective parenting. By doing this we could improve success by identifying techniques that facilitate player-coach-parent partnership.

Reviews from other researches related

In order to study the influence of parenting on young athletes, the role that parents play in the psychological development of the athlete must be understood. The role of a parent to his child's sports experience can vary from being a driver or a fan to something more complex such as the role of coach. Also, parents shape the child's psychological development through its involvement in the sport experience. (Côté & Hay, 2002). No matter the degree of involvement of the parent, it will have a lasting impact on the experience of the young. As proof, research in sports psychology have shown that parents influence motivation and

competence (Brustad, Babkes & Smith, 2001), emotional consequences (Gould, Eklund, Petlichkoff, Peterson & Bump, 1991; Gould, Wilson, Tuffey & Lochbaum, 1993; Scanlan & Lewthwaite, 1984) and developing sporting talent (Bauer, Gould & Martens, 2001).

Recent research showed clearly that parents play an important role in the experience of junior sportsmen. Their actions influence motivation and competence and a variety of emotional states such as satisfaction and anxiety both positive and negative. More recent studies have also begun to examine the role that parents and families play in the development of sporting talent, showing that parents are an important influence. However we should learn more about the effects of parenting. It is important to examine the positive and negative parental influences in the development of elite young athletes.

Research Method

Survey - The role of parents in junior tennis players' success

While an analysis of related research shows that parents play an important role in motivating athletes, emotional responses and the development of talent, it is ironic that many coaches opinions shows that parental involvement in tennis is a problem that interferes with the development of talent. Some coaches even suggest that it would be better if parents would not be involved in their child's tennis players experience. However, the literature shows that parents can have both a positive and a negative role in the development of sporting talent and the psychological state. Moreover, parents have legal and ethical reasons to be involved in this activity of their child. Therefore, it is imperative to better understand the issues of parental involvement in junior tennis and this study wants this.

In an attempt to better understand parental involvement in junior tennis, this study consisted in a survey applied to 14 tennis coaches in Cluj-Napoca in the May-June period of the year 2014. The purpose was to identify the perspective of coaches in Cluj-Napoca over the player-coach-parent triad.

The questionnaire was structured into nine distinct categories of questions as described below:

1. The importance and role of parents in the development of junior tennis player
2. The existence of the parental problem behavior
3. The seriousness of the parental problem behavior
4. Existence of positive parental behaviors
5. Impact of positive parental behaviors

6. Existence problems / bottlenecks encountered in working with parents;
7. Gravity problems / bottlenecks encountered in working with parents;
8. The importance of parental behaviors in junior tennis player;
9. The utility of strategies for working with parents of junior tennis players.

The questionnaire consisted of open and closed items. Coaches were also asked about some demographic and background information such as their experience in coaching or completed studies. Participants were assured of their anonymity at the beginning of the questionnaire. Questions were focused on identifying the coaches' perceptions on the parental role in the success of tennis players, on the positive or negative parenting practices and on the ways in which parents facilitate or affect the coach's activity.

In the end we calculated descriptive statistics (mean, standard deviation, frequency count) using the SPSS software and the values obtained were interpreted.

Results

Of the 25 questionnaires distributed to coaches in Cluj-Napoca, 14 were completed and returned (56%), resulting in a percentage of the sample that can be considered representative for the junior tennis players' coaches in the municipality of Cluj-Napoca.

Regarding the gender, 13 respondents were male (92.85%) and 1 woman (7.15%). The average age of respondents was 31.57 years. The mean of coaching experience was calculated as 11.32 years. Ethnic picture of coaches is: 13 Romanians (92.85%) and one Hungarian (7.15%). Regarding studies, six have obtained a bachelor degree (42.86%) and 8 have completed masterate studies (57.14%). The average number of junior players coached is 20.46 and the average national ranked players is 5.35. The average number of international ranked players coached is only 0.64.

The importance and role of parents in the development of junior tennis player from the perspective of coaches:

- Coaches reported that parents are very important for success in tennis juniors (M = 4.43, on a scale from 1 = not at all important to 5 = very important).
- 40% of parents were perceived as negatively affecting their child's athletic development.
- 56.07% of the parents were perceived as having a positive influence on their child.

Coaches were asked to rank how often they encountered or observed problem behaviors in parent-child relationships using the following scale: 1 = Never, 2 = almost never, 3 = Sometimes, 4 = Often 5 = Always

Most common behaviors were "Unrealistic expectations" (M = 4), "Lack of emotional control on the child's play" (M = 3.79), "Pamper child too much" (M = 3.79) "Provides coaching the child (when parent is not the true coach)" (M = 3.64) and "Criticizes the child" (M = 3.57).

In part 2 of the question respondents were asked about their perception over the gravity of parental problem behaviors using the following scale: 1 = not at all serious, 2 = Very little serious, 3 = Somewhat serious, 4 = severe, 5 = extremely serious.

Behaviors considered most serious were: "Reaction to faults yelling at child" (M = 4.38), "Puts repeated pressure on child regarding how much tennis costs" (M = 4.31), "Not perceiving the child's needs and motivating factors" (M = 3.92) "Contempt on child development" (M = 3.85), "Not supportive with the child" (M = 3.85).

Further reference was made to the positive behaviors of parents and the most encountered behaviors were: "Provides financial support" (M = 4.71) "Provides logistical support (e.g.: Transport)" (M = 4.5), "Makes sacrifices for child's success" (M = 4.43), "Motivates the child during the encountered challenges" (M = 4.36) and "Stresses the importance of the fieldwork" (M = 4.29).

In part 2 of the question respondents were asked about their perception over the impact of the positive parental behaviors using the following scale: 1 = no impact 2 = Very little impact, 3 = little impact, 4 = much impact, 5 = Very much impact.

Behaviors that are considered to have the most impact were: "Make sacrifices for child success" (M = 4.62), "Provides financial support" (M = 4.54), "Creates an environment conducive to achievement" (M = 4.46), "Has an appropriate behavior when the child plays bad" (M = 4.38) and "Guides properly when the child is confused" (M = 4.38).

Regarding the effectiveness of coach-parent relationship coaches were asked to rank how often they encountered or observed problems / bottlenecks of this collaboration using the following scale: 1 = Never, 2 = almost never, 3 = Sometimes, 4 = Often, 5 = all the time.

It was found that the most frequently: "Father undermines the coach by verbal interventions during training" (M = 3.64), "Parent expects results because of high costs involved in practicing tennis" (M = 3.64), "Father fires coach because short-term outcomes" (M = 3.64), "Father does not know anything or know little about tennis" (M = 3.43) and "Child perspective on success in tennis does not coincide with the coaches' (M = 3.36).

The severity of those problems / bottlenecks that stand in the way of good cooperation were clasificated:

The most serious problems / bottlenecks were considered the following: "Father undermining the coach on the player during train verbal interventions" (M = 4.46), "Parent undermines discipline imposed by the coach" (M = 4.38), "Lack of financial involvement to support child" (M = 4.23), "Father ignores / does not meet coach" (M = 4.15) and "Lack of open and frank communication between parent and coach" (M = 4.15).

In the view of the coaches, the most important parental behaviors on a scale of 1-5 (where 1 = Not important and 5 = extremely much importance) are: "Recognize the importance of long-term goals" (M = 4.64), "Reduces the pressure on child's performance" (M = 4.57) and "Agree to the coach's decisions" (M = 4.57), "Makes the child more responsible" (M = 4.57) and "The coach has confidence in decisions related to the development of the child" (M = 4.5) .

Strategies considered to be the most useful in coach-parent collaboration efficiency have been proposed: "Experienced coaches are mentors for less experienced coaches" (M = 4.57), "Building confidence" (M = 4.5), "To be honest and open" (M = 4.5), "Educating parents regarding negative behaviors" (M = 4.5) and "Define the role and responsibilities of parent" (M = 4.43).

Conclusions

The results show that parents play a critical role in the development of junior tennis players. Moreover, while many parents help their children succeed, coaches believe that many parents significantly interfere with the development of their child, and causes damage to the parent-child relationship. This is not surprising, given that parents do not receive information about how to help their child develop in tennis.

It should be recalled that parents do not interfere with the development of their child's sporting development deliberately. They believe they are doing everything they can in the interest of the child. However, many do not have extensive knowledge and experience in competitive tennis and do not understand what is necessary for sustainable development of the junior tennis player. It is time for parents to be better equipped with knowledge in the field, and this paper provides some necessary information.

REFERENCES

Bauer, I., Gould, D. & Martens, R. (2001). USOC developing young champions summit report. *USOC Sport Science and Technology Report.* Colorado Springs, Colorado.

Brustad, R., Babkes, M. & Smith, A. (2001). Youth in sport: Psychological considerations. *Handbook of Sport Psychology*, 604-635.

Côté, J. & Hay, J. (2002). *Family influences on youth sport performance and participation.* Boston: MA: Allyn & Bacon.

Gould, D., Eklund, R., Petlichkoff, L., Peterson, K. & Bump, L. (1991). Psychological predictors of state anxiety and performance in age-group wrestlers. *Pediatric Exercise Science*, *3*, 198-208.

Gould, D., Larry, L., Rolo, C., Jannes, C. & Pennisi, N.S. (2005, January 14). *www.educ.msu.edu.* Retrieved February 19, 2014, from Mischigan State University: *http://www.educ.msu.edu/ysi/articles/ParentsRoleinTennisReport.pdf*

Gould, D., Wilson, C., Tuffey, S. & Lochbaum, M. (1993). Stress and the young athlete: The child's perspective. *Pediatric Exercise Science*, *5*, 286-297.

Scanlan, T. & Lewthwaite, R. (1984). Social psychological aspects of competition for male youth sport participants: I. Predictors of competitive stress. *Journal of Sport Psychology*, *6*, 208-226.

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THE USE OF THE BIOELECTRICAL IMPEDANCE VECTOR ANALYSIS

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ABSTRACT. Bioelectrical impedance vector analysis (BIVA) is a non-invasive, quick and inexpensive technique to estimate body composition and healthcare assessment systems. This technique measures the opposition of body tissues to the flow of an alternating current of 800 μA at an operating frequency of 50 kHz, called bioelectrical impedance. This bioelectrical impedance (Z) consists of two components, resistance (R) and reactance (Xc). In biological structures, application of a constant low-level alternating current results in an impedance to the spread of the current that is frequency dependent. All biological structures have a specific resistance, defined as the strength of opposition by a tissue to the electric current flow. The living organism contains intra and extracellular fluids that behave as electrical conductors and cell membranes that act as electrical condensers and are regarded as imperfect reactive elements.

BIVA is a pattern analysis of impedance measurements plotted as a vector in a coordinate system. Reference values adjusted for age, BMI and gender are plotted as so-called tolerance ellipses in the coordinate system. On this basis, a statement can be made with regard to water balance and body cell mass. Specific BIVA is a promising alternative to classic BIVA for assessing two-compartment body composition, with potential application in nutritional, sport and geriatric medicine.

Keywords: *bioelectrical impedance vector analysis, body composition, health, hydration.*

REZUMAT. ***Utilizarea analizei vectoriale prin bioimpedanţă.*** Analiza vectorială prin bioimpedanţă (BIVA) este o tehnică neinvazivă, rapidă şi necostisitoare pentru a estima compoziţia corporală. Această tehnică măsoară opoziţia ţesuturilor organismului la fluxul de curent alternativ de 800 μA la o frecvenţă de funcţionare de 50 kHz, denumită impedanţă bioelectrică.

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Această impedanţă bioelectrică (Z) este formată din două componente: de rezistenţă (R) şi reactanţă (Xc). În structurile biologice, aplicarea unui nivel scăzut de curent alternativ constant duce la o impedanţă de răspândire a curentului, care este dependentă de frecvenţă. Toate structurile biologice au o rezistenţă specifică, definită ca puterea de opoziţie a unui ţesut la fluxul de curent electric. Organismul viu conţine lichide intra- şi extracelulare care se comportă ca conductori electrici, şi membranele celulare care acţionează în calitate de condensatoare electrice şi sunt considerate ca elemente reactive imperfecte.

BIVA este o analiză model de măsurători de impedanţă, reprezentate grafic ca un vector într-un sistem de coordonate. Valorile de referinţă ajustate pentru vârstă, IMC şi de gen sunt reprezentate grafic ca aşa-numitele elipse de toleranţă în sistemul de coordonate. Pe această bază, o afirmaţie poate fi făcută în ceea ce priveşte echilibrul apei şi masa celulară a corpului.

Din punct de vedere specific BIVA este o alternativă promiţătoare pentru BIVA clasic pentru evaluarea compoziţiei corporale cu posibile aplicaţii în medicina nutriţională, sportivă şi geriatrică.

Cuvinte cheie: *analiza vectorială prin bioimpedanţă, compoziţia corporală, sănătate, hidratare.*

Introduction

Bioimpedance is the collective term that describes safe, non-invasive methods to measure the electrical responses to the introduction of a low-level, alternating current into a living organism, and the biophysical models to estimate body composition from bioelectrical measurements. Although bioimpedance techniques have been used for more than 100 years to monitor assorted biological components, the desire to translate bioelectrical measurements into physiological variables advanced the creation of empirical prediction models that produced inconsistent results (Piccoli, et al., 1994; Lukaski, 2013).

The use of bioelectrical impedance analysis (BIA) is widespread both in healthy subjects and patients, but suffers from a lack of standardized method and quality control procedures. BIA allows the determination of the fat-free mass (FFM) and total body water (TBW) in subjects without significant fluid and electrolyte abnormalities, when using appropriate population, age or pathology-specific BIA equations and established procedures. Published BIA equations validated against a reference method in a sufficiently large number of subjects are presented and ranked according to the standard error of the estimate. The determination of

changes in body cell mass (BCM), extra cellular (ECW) and intra cellular water (ICW) requires further research using a valid model that guarantees that ECW changes do not corrupt the ICW. The use of segmental-BIA, multi-frequency-BIA, or bioelectrical spectroscopy in altered hydration states also requires further research. ESPEN guidelines for the clinical use of BIA measurements are described in a paper to appear soon in Clinical Nutrition (Kyle, et al., a and b, 2004).

This clinical method of handling BIA reveals important variations in nutritional status that would not be detected using anthropometry alone. BIA used in this way would allow more accurate assessment of energy sufficiency in children with neurodisability and may provide a more valid identification of children at risk of underweight or obesity in field and clinical settings (Wright, et al., 2008).

The main concepts of bioimpedance measurement techniques including the frequency based, the allocation based, bioimpedance vector analysis and the real time bioimpedance analysis systems.

The single-frequency bioelectrical impedance vector analysis (SF-BIVA) and multi-frequency bioelectrical impedance spectroscopy (MF-BIS) systems provide similar readings for bioelectrical parameters, and the wide variation in the quantification of volume and body mass must be attributed to the different equations used for calculation (Teruel-Briones, et al., 2012).

BIVA or Vector bioelectric impedance analysis (vector- BIA) or the RXc graph method is a noninvasive, low cost and a commonly used approach for body composition measurements and assessment of clinical condition and has recently been developed to assess both nutritional status and tissue hydration (is a useful method to evaluate tissue hydration) (Savastano, et al., 2010, Dumler, et al., 2003; Espinosa Cuevas, et al., 2010; Erdoğan, et al., 2013). The impedance vector produced by an alternating current in the bioimpedance analysis can be seen as a standardised test of cellular mass and function since reactance is believed to reflect the mass and integrity of cell membranes (Norman, 2009).

The use of the bioelectrical impedance vector analysis

The BIVA approach has gained attention as a valuable tool to assess and monitor patients' hydration status and nutritional status since it is independent of disputable regression equations for calculation of lean body mass and fat mass as well as independent of measurement of body weight (Piccoli, et al., 1994).

Technique BIVA - introduced by Piccoli et al. - is a non-invasive, quick and inexpensive technique to estimate body composition. This technique measures the opposition of body tissues to the flow of an alternating current of 800 μA at an operating frequency of 50 kHz, called bioelectrical impedance. This bioelectrical impedance (Z) consists of two components, resistance (R) and reactance (Xc). All biological structures have a specific resistance, defined as the strength of opposition by a tissue to the electric current flow. Fat-free tissues and fluids are good conductors, while bone and fat tissues are bad conductors, being electrically resistant. In terms of impedance, the human body can be schematically considered as a system composed of several conductors in parallel, which pass through two pathways: the extracellular tissue and intracellular membranes. In order to simplify the measurements, the human body is approximated as a sum of five interconnected cylinders that act as conductors in parallel and, while the R is inversely related to the amount of total body water (TBW), the Xc is considered proportional to body mass. Therefore the resistance is inversely related to the TBW, thus representing an indirect measure of the amount of body fluid. The body fluids and electrolytes are responsible for electrical conductance, and cell membranes are involved in capacitance. Bioelectrical impedance measurements have been related to biological function such as pulsatile blood flow and to determination of total body water in healthy and diseased individuals (Piccoli, et al., 1986; Kushner, 1992; Di Somma, et al., 2014).

BIVA is performed with a portable battery-operated device that can be applied in every critical setting requiring quick evaluation.

A diagnostic, clinically relevant BIVA test should be performed with the test person in supine position, aiming at a more uniform distribution of body fluids. We recommend a laying time of 5 minutes, in adipose subjects of 10 minutes before the test. In principle the bio-impedance test can be carried out in any body position, also sitting. To avoid erroneous tests due to skin contact between extremities and trunk, arms and legs should be slightly abducted, in particular in obese individuals.

Each human research subject, clothed but without shoes or socks, was supine in the horizontal position on a bed. For its measurement, the subject must be supine with inferior limbs at 45° and superior limbs abducted at 30° to avoid skin contacts with the trunk and with the stretcher (Di Somma, et al., 2014).

Each two electrodes are placed on the hand and foot of the right side of the body. Should the right side not be available for testing due to an amputation, metal implants, or for any other valid reason, the left side can be used. Repeat tests should always be applied to the same side of the body. In the area where the electrode is to be attached, the skin surface should be cleaned using an alcoholic swap or spray, removing fatty substances, such as body lotion, and skin residue.

Aluminum foil spot electrodes were positioned in the middle of the dorsal surfaces of the hands and feet proximal to the metacarpal-phalangeal and metatarsal-phalangeal joints, respectively, and also medially between the distal prominences of the radius and the ulna, and between the medial and lateral malleoli at the ankle. Specifically the proximal edge of one detector electrode was in line with the proximal edge of the ulnar tubercle at the wrist, and the proximal edge of the other detecting electrode was in line with the medial malleolus of the ankle (Lukaski, et al.,1986).

Four cutaneous electrodes, two on the wrist and two on the ipsilateral ankle, are applied with an inter-electrode distance of at least 5 cm to prevent interaction between electrodes.

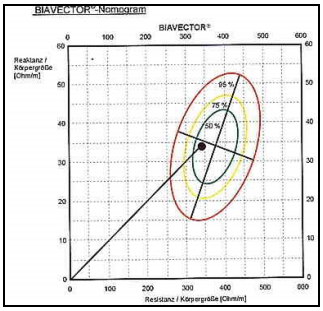
This method was used to minimize contact impedance or skin-electrode interaction. Measurements were made 2 h after eating and within 30 min after voiding (Lukaski, et al., 1986).

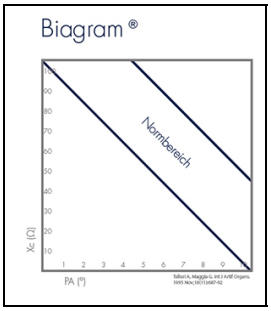
The exact, repeatable position of the proximal electrode, oriented on anatomical landmarks, determines test precision and comparability. Small difference in electrode positioning can lead to substantial differences in test result.

Therefore no predictive equations are used to translate bioelectrical measurements into body composition variables, but a semiquantitative assessment of both body composition and hydration status is performed by directly interpreting the bioelectrical measures (that is, the impedance vector).

The bioelectrical impedance is measured in about 30 s, and the results can be displayed in two different modalities: as a vector or as a single number expressed in percentage in a specific scale.

The first method plots the two components R and Xc on a graph to provide a vector (and yields a vector that has length and direction) whose length is proportional to TBW, and the angle above the x axis (referred to as the phase angle) is reflective of cellular integrity. Reference values are adjusted for patient's age, body mass index, gender and height (Lukaski, 2013; Di Somma, et al., 2014). Given that *R* is inversely related to the ICW and ECW, and that Xc is directly related to the amount of soft tissue structures (mass), the vector length provides information about tissue hydration, and vector direction (that is, phase angle) provides information about the amount of cell mass contained in soft tissues (Camina Martín, et al., 2014). Three tolerance ellipses are plotted, corresponding to the 50th, 75th and 95th vector percentile of the healthy reference population of same sex and race. The major axis of this ellipses indexes hydration status, while the minor axis reflects tissue mass.





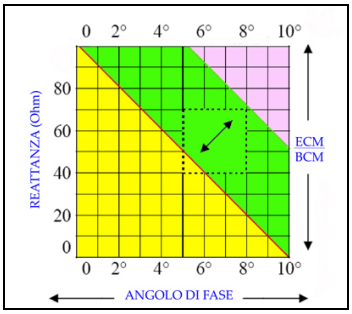


Fig. 1. - BIVA Nomogram **Fig. 2.**- BIVA Biagram **Fig. 3.**- BIVA Biagram
(*https://www.google.ro/search?q=biva+nomogram&source*; Talluri et Maggia, 1995.)

The second method expresses the state of hydration as a percentage in a scale called the hydrograph (or biagram, hydrogram). A normal value, corresponding to the 50th percentile, is included in the range between 72,7 and 74,3 % (Piccoli, et al., 1995).

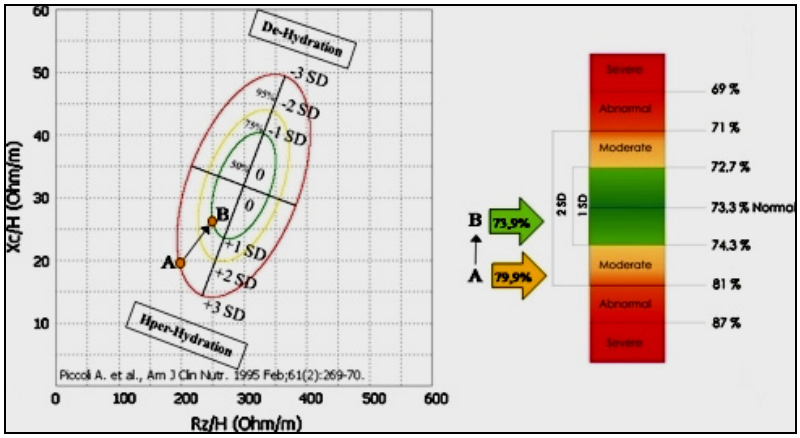


Fig. 4. - BIVA nomogram and numeral scale (Piccoli, et al.,1995)

The RXc graph method was used to identify bivariate pattern distributions of mean vectors (95% confidence ellipses by sex, age, and body mass index), and individual impedance vectors (50%, 75%, and 95% tolerance ellipses) (Piccoli, et al., 2002; Norman, et al., 2009).

The graphs and vector analysis were performed with the software. An integral part of the Bodygram PRO software, BiaVector® and BiaGram are indispensible clinical tools allowing an at-a-glance analysis of nutrition and

hydration states as well as therapy follow-up. While the determination of body compartments depends on entered co-predictors such as weight, age, and gender, BiaVector® and BiaGram represent results based on factual BIA measurement only. This clinically validated and meanwhile widely practiced method facilitates body analysis also under difficult conditions, e.g. in obesity, nephrology, oncology, and cardiology. BIVA is particularly suited to follow hydration states in haemodialysis, to analyse emergency and ICU conditions, as well as optimize nutritional or physical activity programs.

The test itself takes only a few seconds. Preparing the test and performing the evaluation with take a total of three to five minutes.

The inter-subject variability of the impedance vector is represented by the bivariate normal distribution with elliptical probability areas (50, 75 and 95%) in the tolerance ellipses for individual vectors.

The main advantage of BIVA over other methods for body composition analysis is that it does not yield any absolute estimate of body compartments, makes no assumptions about body geometry, hydration state or the electrical model of cell membranes and is unaffected by regression adjustments. Thus, BIVA is valid for body composition analysis both in healthy (Piccoli, et al., 1995; Wright, et al., 2008; Buffa, et al., 2009) and pathological populations (Dumler & Kilates, 2003; Marini, et al, 2012; Teruel-Briones, 2012; Camina Martín, 2014).

In countless scientific studies bio-impedance testing was validated against reference methods. The current scientific literature documents a high validity (accuracy, repeatability, and operator independence) for essential body composition parameters, such as total body water, fat free mass, fat mass, cell mass, extracellular water, relative to so-called gold standards.

BIA is applied to children and infants. The Bodygram software contains pediatric predicted norms. The electrode placement differs from that of adults.

BIA ever been applied in cats, cows, ice bears, brown bears, pigs, sheep, apes, horses, and other animals. Testing of animals requires techniques and methodology different from that of humans.

For the application of bio-electrical impedance testing only a limited number of contraindications exists. The following persons should not be tested: persons with implanted cardioverter-defibrillator (ICD), persons with high fever and pregnant women (only out of ethical reasons). While the following persons can be tested: persons with prostheses or metal implants, persons with amputations and persons with pace makers.

BIVA is a pattern analysis of impedance measurements (resistance and reactance) plotted as a vector in a coordinate system. Reference values adjusted for age, BMI and gender are plotted as so-called tolerance ellipses in the coordinate system. On this basis, a statement can be made with regard to water balance (normo-, hypo-, hyperhydration) and body cell mass (nutritional status).

The essential fundamentals of bioimpedance measurement in the human body and a variety of methods are used to interpret the obtained information.

Specific BIVA is a promising alternative to classic BIVA for assessing two-compartment body composition, with potential application in nutritional, sport and geriatric medicine (Buffa, et al., 2014).

REFERENCES

Buffa, R., Floris, G., & Marini, E. (2009). Assessment of nutritional status in free-living elderly individuals by bioelectrical impedance vector analysis. *Nutrition* 25: 3–5.

Buffa, R., Mereu, E., Comandini, O., Ibanez, M.E. & Marini, E. (2014). Bioelectrical impedance vector analysis (BIVA) for the assessment of two-compartment body composition. *Eur J Clin Nutr*. 68(11):1234-1240.

Camina Martín, M.A., de Mateo Silleras, B. & Redondo Del Río, M.P. (2014). Body composition analysis in older adults with dementia. Anthropometry and bioelectrical impedance analysis: a critical review. *Eur J Clin Nutr*. 68(11):1228-1233.

Di Somma, S., Vetrone, F. & Maisel, A.S. (2014). Bioimpedance vector analysis (BIVA) for diagnosis and management of acute heart failure. *Curr. Emerg. Hosp. Med. Rep*. 2: 104-111.

Dumler, F. & Kilates, C. (2003). Body composition analysis by bioelectrical impedance in chronic maintenance dialysis patients: comparisons to the National Health and Nutrition Examination Survey III. *J Ren Nutr*. 13(2):166-172.

Erdoğan, E. et al. (2013). Reliability of bioelectrical impedance analysis in the evaluation of the nutritional status of hemodialysis patients - a comparison with Mini Nutritional Assessment. *Transplant Proc*. 45(10):3485-3488.

Espinosa Cuevas, M.A. et al. (2010). Body fluid volume and nutritional status in hemodialysis: vector bioelectric impedance analysis. *Clin Nephrol.* 73(4):300-308.

Kushner, R.F. (1992). Bioelectrical impedance analysis: a review of principles and applications. *J Am Coll Nutr.* 11(2):199-209.

Kyle, U.G. et al. (2004). a. Composition of the ESPEN Working Group. Bioelectrical impedance analysis--part I: review of principles and methods. *Clin Nutr.* 23(5):1226-1243.

Kyle, U.G. et al. (2004). b. ESPEN. Bioelectrical impedance analysis-part II: utilization in clinical practice. *Clin Nutr.* 23(6):1430-1453.

Lukaski, H.C., Bolonchuk, W.W., Hall, C.B. & Siders, W.A. (1986). Validation of tetrapolar bioelectrical impedance method to assess human body composition. *J Appl Physiol.* 60(4):1327-1332.

Lukaski, H.C. (2013). Evolution of bioimpedance: a circuitous journey from estimation of physiological function to assessment of body composition and a return to clinical research. *Eur J Clin Nutr 67*. Suppl 1: 2–9.

Marini E. et al. (2012). The potential of classic and specific bioelectrical impedance vector analysis for the assessment of sarcopenia and sarcopenic obesity. *Clin Interv Aging*. 7:585-591.

Norman, K. et al. (2009). Bioimpedance vector analysis as a measure of muscle function. *Clin Nutr.* 28(1):78-82.

Piccoli, A., Rossi, B., Pillon, L. & Bucciante, G. (1994). A new method for monitoring body fluid variation by bioimpedance analysis: the RXc graph. *Kidney Interantional* 46: 534–539.

Piccoli, A., Nigrelli, S., Caberlotto, A., Bottazzo, S., Rossi, B., Pillon, L. & Maggiore, Q. (1995). Bivariate normal values of the bioelectrical impedance vector in adult and elderly populations. *Am J Clin Nutr*. 61(2):269-270.

Piccoli, A., Pillon, L. & Dumler, F. (2002). Impedance vector distribution by sex, race, body mass index, and age in the United States: standard reference intervals as bivariate *Z* scores. *Nutrition*, 18; 153–167.

Savastano, S. et al. (2010). Validity of bioelectrical impedance analysis to estimate body composition changes after bariatric surgery in premenopausal morbidly women. *Obes Surg.* 20(3):332-339.

Talluri, A. & Maggia, G. (1995). Bioimpedance analysis (BIA) in hemodialysis: technical aspects. *Int J Artif Organs*. 18(11):687-692.

Teruel-Briones, J.L. et al. (2012). Analysis of concordance between the bioelectrical impedance vector analysis and the bioelectrical impedance spectroscopy in haemodialysis patients. *Nefrologia*. 32(3):389-395.

Wright, C.M., Sherriff, A., Ward, S.C., McColl, J.H., Reilly, J.J. & Ness, A.R. (2008). Development of bioelectrical impedance-derived indices of fat and fat-free mass for assessment of nutritional status in childhood. *Eur J Clin Nutr.* 62(2):210-217.

https://www.google.ro/search?q=biva+nomogram&source=lnms&tbm=isch&sa=X&ei=jkZgVOysHoKLaKvNgsAN&ved=0CAgQ_AUoAQ&biw=1280&bih=642#facrc=_&imgdii=_&imgrc=5_FynxOIoHInlM%253A%3BbrxmsG0sW9Y_9M%3Bhttp%253A%252F%252Fopeni.nlm.nih.gov%252Fimgs%252F512%252F25%252F3151484%252F3151484_10741_2011_9244_Fig1_HTML.png%3Bhttp%253A%252F%252Fopeni.nlm.nih.gov%252Fdetailedresult.php%253Fimg%253D3151484_10741_2011_9244_Fig1_HTML%2526req%253D4%3B488%3B263

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SOCIAL AND PERSONAL DEVELOPMENT OF CHILDREN THROUGH SPORTS

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ABSTRACT. Sport offers more that physical health benefits, for many children and adolescents contributing to their successful personality shaping, to a better socialization and social development. There are more and more studies that offer data that support the idea that sports have an important role in the well balanced development of young people. We consider that sport sociology researches have the role to future emphasize even more the importance of sports into children lives.

Keywords: *children, sport, personal development, social development*

REZUMAT: ***Dezvoltarea socială şi personală a copiilor prin sport***. Sportul oferă mai mult decât beneficii referitoare la starea de sănătate fizică, pentru mulţi copii şi adolescenţi implicarea în activităţi sportive contribuind la formarea şi modelarea armonioasă a personalităţii lor, la o mai bună socializare în general. Sunt din ce în ce mai numeroase studiile care vin să ofere argumente pentru rolul benefic al sportului în dezvoltarea echilibrată a sinelui la copii şi adolescenţi. Considerăm important ca cercetările din domeniul sociologiei sportului să pună un accent sporit pe aspectele ce reliefează aceste contribuţii ale sportului la o bună dezvoltare personală şi socială a copiiilor şi tinerilor contribuind astfel la promovarea practicării lui.

Cuvinte cheie: *copii, sport, dezvoltare personală, dezvoltare socială*

Introduction

Sport offers more than health benefits for children; it is more than just a form of exercise to reduce the risk of developing lifestyle diseases. For many children and young people, sport represents a significant part of their lives, contributing to shaping their development into members of society and the kind of people they become.

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There are a significant number of empirical studies that have been conducted on the personal, moral, and social learning as outcomes from children's participation in sport and on the nature of their experiences of it (MacPhail, Gorely, & Kirk, 2003).

Children social and personal development through sports

Child development refers to the biological, psychological and emotional changes that occur between birth and the end of adolescence. Physical activities, sports, can contribute to the holistic development of children and adolescents, fostering their physical, emotional and social wellbeing.

If the role of curricular activities in schools is well enough established, the relevance of extra-curricular activities for children's human capital formation is not yet well understood. As we know, one of the most popular extra-curricular activities is sport. According to the National Alliance of Youth Sports (NAYS) around 65% of children from all over the world are involved in sports activities (Felfe, Lechner, Steinmayr, 2011)

The role that sport can play in the social, personal, and moral growth of children and young people it is better highlighted in countries such as Australia, Germany, and the United Kingdom where many children are involved in community-based and commercial club sport (Light, 2008). While 55% of American children are involved in youth sports, among German children this number is higher: about 70% of all children aged 6-14 are engaged in sports activities (Kutteroff & Behrens, 2006).

The results of a study conducted in Germany indicated as positive effects of sports the fact that both cognitive skills, measured by school performance, and overall non-cognitive skills improved statistically significant (Felfe, Lechner, Steinmayr, 2011).

Light (2010) underlined the contribution that sport can make toward the social and personal development of children on a case study of an Australian Swimming Club. The study was focused on children aged 9 to 12 years of age, and explores the range of social, personal, and cultural development that occurs through their participation in the activities of the club. A range of important social learning, enculturation, and the development of identity arises from participation in the practices of the swimming club.

Ronnie Lidor and Boris Blumenstein (2011) underlined the importance of adults that support sports activities like coaches and sport psychology consultants in children overall development. They described the consultation approach of one sport psychology consultant (SPC) in fostering relationships among adolescent

soccer and basketball players coming from conflicting cultures. The article also highlights the fact that in order to foster relationships among the players, the SPC used a three-dimensional approach - working with the coaches of the teams, the players, and the parents of the players.

Other researches that proved the positive impact of sports in children's life, conducted in US, underlined as well that extracurricular activities of children have been positively associated with other aspects of children's life such as academic achievement and social adjustment (Eccles et al, 2003).

The claims of sport promoters are many, but, in the case of youth sports, they can be organized into three major categories, including personal character development, reforming "at-risk" populations, and fostering social capital leading to future occupational success and civic engagement (Coalter, 2007).

In the United States, participation in organized sports activities represents a prominent aspect of middle class children's life. In surveys and interviews parents expressed the belief that sports activities in particular foster qualities children need in order to be successful, well-adjusted people, and respectable members of society (Kremer-Sadlik, Kim, 2007). As authors suggested, there is not only the fact that children are encouraged by parents to practice sports but there are also cultural, social and historical messages which signal that children should participate in sports.

There are a significant number of reasons to promote sport activities for children and adolescents. It is necessary for the state to create formal opportunities to practice sports in curricular school activities but it is also important to have an overall perspective of the society that is sports-practicing oriented.

Conclusions

In a day by day more complex world of rapidly changing meanings, as Alvin Toffler (1991) underlined, and at a time when many children and adolescents are struggling to form a sense of who they are, membership in the sport club provides important opportunities for them to develop their own identity and a sense of belonging. In terms of physical and health aspects of children and adolescents development, there is an overwhelming amount of evidence that focuses on the positive effects of sport and exercise on physical health, growth and development. Through participation in sport and physical education, young people can also learn about the importance of key values such as: honesty, teamwork, fair play, respect for themselves and the others, and adherence to rules. For instance, victory in competition may raise children's self-esteem while defeat can teach them how to deal with such a situation. Therefore, we have to focus, as well, onto these aspects that also represent a contribution of sports to young people development.

Despite of the popularity of sports as a leisure activity for young people there is not enough empirical evidence on the relation between sports participation and children skills formation. It is necessary to identify the conditions under which particular outcomes are likely to occur, and there is also a need for critical research and theory that identifies the processes through which sport participation is linked with subsequent forms of civic engagement as Coakley (2011) suggested. That is why sports deserve more consideration from researchers in sport sociology for the part that sports can play in the development of children.

REFERENCES

Coakley, J. (2011). Youth Sports: What Counts as "Positive Development?", in *Journal of Sport and Social Issues,* 35: 306, *http://jss.sagepub.com/content/35/3/306.full.pdf*, downloaded on October 9, 2014.

Coalter, F. (2007). *A wider social role for sport: Who's keeping the score?* London, UK: Routledge.

Eccles, J.S., Barber, B.L., Stone, M. and Hunt, J. (2003). *Extracurricular Activities and Adolescent Development*, in Journal of Social Issues 59(4): 865–89.

Felfe, C., Lechner, M., Steinmayr, A. (2011). *Sports and Child Development, http://ftp.iza.org/dp6105.pdf,* downloaded on November 8, 2014.

Kutteroff, A., Behrens, P. (2006). *KIM Studie 2006: Kinder und Medien, Computer und Internet. Medienpädagogischer Forschungsverbund Südwest, http://www.mpfs.de/fileadmin/KIM-pdf06/KIM2006.pdf*, downloaded on November 8, 2014.

Lidor, R., Blumenstein, B. (2011). Working With Adolescent Soccer and Basketball Players From Conflicting Cultures-A Three-Dimensional Consultation Approach, in *Journal of Sport & Social Issues,* 35: 229 *http://jss.sagepub.com/content/35/3/229*, downloaded on October 22, 2014.

Light, R. (2008). *Sport in the lives of young Australians*. Sydney, Australia: Sydney University Press.

Light, Richard L. (2010). Children's Social and Personal Development Through Sport: A Case Study of an Australian Swimming Club, in *Journal of Sport & Social Issues,* 34: 379, *http://jss.sagepub.com/content/34/4/379*, downloaded on October 22, 2014.

Kremer-Sadlik, T., Kim, J.L., (2007). Lessons from sports: children's socialization to values through family, in *Discourse & Society*, 18:35, *http://www.sagepub.com/ballantine2study/articles/Chapter%201/Kremer-Sadlik.pdf*, downloaded on November 8, 2014.

Toffler, Alvin (1991). *Future Shock*, New York: Bantam Books.

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LEGISLATIVE AND CURRICULAR HIGHLIGHTS FOCUSED UPON THE PHYSICAL DEVELOPMENT AND HEALTH AREA WITHIN THE EARLY EDUCATION FRAMEWORK, IN TERMS OF REGIONAL COORDINATES IN THE EUROPEAN UNION SPACE

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ABSTRACT. In recent years, early education turned into a strategy for the European countries in their wish to support children's global development starting from birth up to reaching primary education. Two major courses of action are witness to this. The first course of action covers the legislative documents worked out on the occasion of events which benchmarked the policies related to children's early development, while the second one is given by the transposition of those legislated, namely into such curriculum documents, which are specific to the agreed age range. This study aims at a brief analysis of the curriculum in five countries, i.e. in Finland, Germany, Spain, Hungary and Romania, selected on grounds of the different regions criterion from within the European Union space. According to their respective levels, we tried to grasp the main - both common and specific - coordinates upon which the implementation of the early education, as a transitory form of the ante-preschool education towards the traditional instructive-educational process set for preschool education, relies. Also, in terms of national curriculum and/or guiding documents specific to the early education sector, we provide an overview of the significance enjoyed by the physical development and health area, in each such visited country.

Key words: *early education, legislation, differentiated national curriculum, physical development and health*

REZUMAT. ***Repere legislative și curriculare centrate pe domeniul dezvoltării fizice și a sănătății în cadrul educației timpurii, raportate la coordonatele regionale din spațiul Uniunii Europene.*** **I**n ultimii ani, educația timpurie a devenit o strategie a țărilor europene prin care se dorește sprijinirea dezvoltării globale a copilului, începând de la naștere până la trecerea în învățământul primar. Acest

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fapt, este reflectat prin două direcţii majore de acţionare. Prima direcţie, cuprinde documentele legislative elaborate cu ocazia evenimentelor care au marcat politicile privind dezvoltarea timpurie a copiilor, iar cea de-a doua, este dată de transpunerea celor legiferate, în documentele curriculare specifice intervalului de vârstă convenit. Prezentul studiu, îşi propune o analiză succintă a curriculei din cinci ţări, şi anume: Finlanda, Germania, Spania, Ungaria şi România, luând ca şi criteriu de selecţie a acestora, regiuni diferite ale spaţiului Uniunii Europene. La nivelul lor, am încercat să surprindem principalele coordonate - comune şi particulare - ce stau la baza implementării educaţiei timpurii, ca formă tranzitorie de instruire antepreşcolară, către procesul instructiv – educativ tradiţional, statuat la nivelul învăţământului preşcolar. De asemenea, în cadrul curriculumului naţional şi/sau a documentelor directoare specifice sectorului de educaţie timpurie, pentru fiecare ţară vizată, am realizat o analiză a semnificaţiei acordate domeniului dezvoltării fizice şi sănătăţii.

Cuvinte cheie: *educaţie timpurie, legislaţie, curriculă naţională diferenţiată, dezvoltare fizică şi sănătate*

Early education, concept definitions

Early education has a novel and more extended significance as compared to how it was regarded until the last two decades of the last century. Throughout the said period of time, the concept referred to education intended for children prior to schooling (i.e. within 3 - 6/7 years of age) and carried out as a systemised activity in specialized institutions such as kindergarten.

Preoccupations concerning this type of education have been mirrored by events which benchmarked the policies related to children's early development. On the occasion thereof, several legislative documents have been worked out to define the early education context.[3] By virtue of these documents, the extended meaning of early education is aimed at: covering the entire period of development for each and every child within 0 and 6/7 years of age; making the most and under an optimum context of any child's potential; shifting the focus of attention towards the expediency of taking care of small children „out of family", i.e. within the framework of specialized educational services.

According to (EI, 2010, p. 10), the most frequently used syntagmas referring to the early childhood definition are as follows: *early childhood care and education* (ECCE) used by UNESCO; *early childhood education and care* (ECEC) used by the

[3] MECT, (2008a, pp. 2-4).

Organization for Economic Cooperation and Development (OECD); *early child/childhood development* (ECD) used by the World Bank and United Nations International Children's Emergency Fund (UNICEF); *early childhood education* (ECE).

Early education advantages

Due to the fast pace shown at the level of neuronal connections as well as brain development and growing, this period is deemed to be a window of opportunity for optimizing children's development by a compound impact involving education, care, health, nutrition, social protection and intellectual stimulation of children.

The most important are the first two years of life when the most significant changes take place in terms of intellectual, emotional, psychological and social aspects. Adult intervention upon any child is - within this period - fundamental.

Studies in the field of preschool early education have highlighted significant correlations between kindergarten attendance and children's behaviours as pupils (Pre-School Education in the European Union. Current Thinking and provision, 1995, in „Curriculum for Preschool Education", MECT, 2008a, p. 41). From among these, the following can be distinguished: a significant progress at an intellectual level in children, no matter the environment they originate from; positive effects upon the future social integration and mitigation of deviant behaviours as well as school failures; discovery of own identity and autonomy by each child as well as development of a positive self-image; development of social abilities through interactions generated by the learning environment; task-centred behaviours; social-emotional development; motivation and positive attitudes towards learning.

Guideline documents for planning and organizing educational contents

The „guideline documents" concept is used for covering the variety of official approaches intended for directing or leading ECEC providers in various countries. In this perspective, guideline documents include as follows: learning content, objectives and results, objectives to be attained, as well as instructions concerning pedagogical approaches, learning activities and methods of assessment.

In terms of their form, guideline documents for ECEC vary considerably, from one county to the other. Such documents can be incorporated into legislation as part of an educational programme (Estonia, Spain, France and Slovenia), yet in other countries the same are published as a reference framework of competences and practical instructions for ECEC specialists (Belgium - French Community),

care and education schedules (in various German *Länder*), educational standards (Ireland and Malta) or criteria for local school curricula development (Lithuania). (European Commission, 2014, p. 117)

In almost half of the European Union countries, the educational component within the framework of guideline documents is established for children of all age categories (from 0 to 6/7 years) while in the other half of the countries, the same is targeted only towards children who are older (i.e. 3-6/7 years of age). (European Commission, 2014, p. 118)

Absolutely all European countries, without exception, specify objectives related to the following: personal, emotional and social development, as well as linguistic and communication competences. *Physical development and health education* are also included all over, except for Croatia. The development of artistic and world comprehension competences are highlighted in the great majority of the countries both for small and for older children.

Analysis of curricula/guideline documents in Finland, Germany, Spain, Hungary and Romania

In order to have the fullest possible image of the planning and organizational forms of early education contents in Europe, we proceeded to analysing five countries located in various regions of the continent, from the perspective of the official documents acting as guidelines for the early care and education services.

Finland

Compulsory education begins at 7 years of age. For children who have already reached 6 years of age, there are specific pre-primary education programmes offered at no charge to schools or daytime centres.

Each municipality is pledged to provide pre-primary education for at least 700 hours per year, distributed as follows: 4 days weekly and not in excess of 4 hours a day.

The scheduled early education content is implemented relying upon the information provided in the Guidelines for Applying the National Curriculum to Children's Early Education and Care (*National Curriculum Guidelines on ECEC – 2003*).

In terms of preschool age children, the curriculum does not define educational objectives however there are requirements related to training the ability to analyse, synthesize and integrate the acquired knowledge and experience. Thus, the Finnish curriculum guidelines *do not focus upon performance requirements* but are rather confined to how contents are assimilated.

By virtue of the National Curriculum for Pre-primary Education, the basic role of the preschool education is to support the process of turning children into human individualities and responsible members of the society by building abilities to responsibly act and appreciate peers, in keeping with certain generally accepted norms. According to Lindeboom, G.-J., Buiskool, B.-J. (2013, p. 14), the educational objectives stipulated for the curriculum are as follows: promoting personal welfare; consolidating attentive / polite behaviour towards peers; gradual development of autonomy. As a peculiarity, in Finland, beyond the national curriculum, each municipality defines an own curriculum and implementation methodology and works it out relying upon principles as set forth by the ministry.

All staff members involved in early education shall approach the areas identified in the curriculum in an integrated manner, avoiding to treat the same separately (apart). These areas are as follows: language and interaction; mathematics; ethics and philosophy; studies of environment and nature; *health; physical and motor development*; art and culture.

In the case of physical and motor development, daily physical exercises are essential for the children's growth and harmonious development as well as health. Physical condition, motricity, motion control, basic motor abilities etc., are to be trained by way of exercises and playing. Fine motor skills, manual abilities and eye-hand coordination are to be developed through daily activities. Children are to be encouraged to act independently, proactively and cooperatively within the team, namely to show trust in all exercising situations. Also, they are to be informed about the importance and the beneficial effects of practicing physical exercises onto health and personal welfare. (FNBE, 2010, p. 14).

As far as educators are concerned, it is important that they are capable to use various teaching methods and provide a systematic observation in terms of the children's motricity level. Connecting motor activities with other learning activities result in increased opportunities for teaching children. Playgrounds shall be arranged so that to stir interest for learning something new and encourage children in acquiring / developing abilities of motion. (STAKES, 2003, p. 22)

Germany

Germany is one of those few European countries which have just recently begun to consider adopting formal curricular instructions for the activity within the early education framework. This has to do with the sophistication of the federal system which includes 16 regional states, each having autonomy in the policy of education.

For each land, guidelines, rules and cost levels are established in terms of educational and ECEC issues. The role of the municipalities is to implement the plotted strategy and provide children's care and education facilities.

In the year 2004, at a federal level, a joint (non-compulsory) framework has been worked out for guiding pedagogical activity in centres specialized in early education. (Lindeboom & Buiskool, 2013, p. 29) By virtue of the said document, educational objectives emphasize building out basic competences as well as developing and consolidating personal possibilities in children with a view to motivate and prepare them so that they can cope with future challenges during the learning process and life, become responsible members of the society and show openness towards learning throughout their entire lives. (Eurydice, 2013, p. 97)

Curricular guidelines are defined in a rather broad sense, i.e. each land has the possibility to detail and particularize the same.

The joint framework for early education in children's care centres covers the following educational areas (domains): language, writing, communication; personal and social development; development of values and religious education; mathematics, natural sciences, (information) technology; musical education / using various media devices; natural and cultural environments; *body, exercise, health.*

The *„body, exercise, health"* domain description reveals the fact that physical exercise plays an important role both in building out an attitude of assuming responsibilities in children for their physical welfare and health condition, and in the cognitive, emotional and social development thereof.

For each of the above mentioned domains, behaviours specific to the age range are described and examples of didactic procedures are given with a view to be used and support children's development according to the desired path, as may be applicable. These are supplemented by information concerning the methodology for organizing learning experiences (choosing methods and means, setting up conditions to enable the assimilation of the approached contents etc.).

Spain

In **Spain**, the main direction of educational policy was established at a national level in 2006 → namely by the „*Lei Organica de Educación*" (LOE) Act. This Act covers the objectives, standards and assessment procedures set forth for all educational levels, including the ones applicable to early education for children. Moreover, several royal decrees have been implemented to offer more specific regulations at a national level.

By virtue of the Act on Education of the year 2006, the main aim of education and early care is to contribute to the *physical development*, as well as the affective, social and intellectual development in children.

According to the national and autonomous communities' legislation, the ECEC providers' training programme is developed by competent teachers. The proper balance between cognitive and non-cognitive abilities within a curriculum is subject to the educational centre, as always concerned.

Hungary

In **Hungary,** the National Institute for Family and Social Policies has drawn up within 2004-2005 a basic programme for ante-preschool education (children within the 0 to 3 years of age range) – called *„Bölcsődei alapprogram"*.

With a view to provide a logical connection between the two levels of early education, the content and structure of the said document have been established in keeping with the national program for preschool education – called *„Óvodai nevelés országos alapprogramja"*.

The basic characteristics of the national programme for preschool education are as follows: relies upon the Hungarian preschool education values and experience (routine); takes into account children's rights; supplements education received in family; restrictions applied thereby are in favor of children; establishes certain limits in children's interest and provides for some compulsory services; ensures methodological freedom for educators; pleads for principles focusing upon the child → children's needs are always the ones which define the content of the objectives tasks and activities, ensures pluralism → for instance: implementing certain various educational principles.

Among preschool education objectives, mention must be done about the following: *multilateral and harmonious development in children*; favouring personality development in children, taking into account individual and age peculiarities and, respectively, any difference in terms of development pace; *building up a healthy life style*; intellectual and emotional education; ensuring children's socialization; organizing instructive-educational activities under the form of playing.

Instructive-educational activities through which knowledge is transmitted and basic capacities are developed take various forms: playing, poetry, tale, song/ music, musical plays, drawing, handiwork, physical exercise, active awareness of the environment, work, learning. (Eurydice, 2007, p. 60)

For instructive-educational movement activities, the national programme of preschool education highlights the importance of developing coordination and conditional capacities as well as fine and gross motricity; it is stipulated that the acquired sophisticated motions shall also be integrated into other typical activities with a view to achieve a global influence of all domains for building up a positive self-image, emotional control, esteem, as well as cooperation and communication at the preschool children's level.

Through guided activities, the following shall be pursued: increasing motivation for learning, stimulating children's interest, organizing exercises with the involvement of as many analysers as possible, ensuring children's active participation in the process of acquiring experiences etc.

Romania

In **Romania**, the curriculum features a unitary and coherent vision, being structured according to two (0 - 3 years of age and 3 - 6/7 years of age) ranges and, respectively, according to two intervals for each of the said levels.

The curriculum is structured according to *development domains*, the end result of the education in early childhood being children's global development to provide a proper start in the life thereof. These areas are as follows: *physical development, health and personal hygiene*; social-emotional development; development of the language, of the communication and of the premises for reading and writing; cognitive development and awareness of the world; learning capacities and attitudes. (MECT, 2008a, p. 7)

The framework and reference objectives in the said curriculum are formulated according to *experiential domains*, taking into account the benchmarks established by the development areas. These experiential areas are as follows: language domain; social-emotional domain; cognitive domain, *psychomotor domain*, which covers coordination and control of body motions, general mobility and physical strength, motor and fine handling abilities, as well as knowledge items mostly related to the human anatomy and physiology. The activities through which pre-schoolers can be made familiar with this domain are activities involving body motion, competitions among individuals or groups, focused on psychomotor abilities, as well as activities which can result in a better suppleness, force, strength or attitude. (MECT, 2008b, p. 14)

For the 3 - 6/7 years of age range, in addition to the framework and reference objectives, such *curricular areas* are suggested which, due to their content, are capable of providing support in attaining the said objectives. The curricular areas targeted by the curriculum are as follows: language and communication, sciences, arts, *physical education,* education for society.

Conclusions

Further to the review of the early education curriculum in the five targeted countries, the following common issues can be revealed:

- availability of a framework curriculum which offers guidelines in terms of the contents and general objectives of domains approached at a preschool age;

- generally speaking, curricular stipulations emphasize the balanced and „comprehensive" approach to children's development;
- curricula include principles of learning by playing and learning by discovering;
- in all countries of the European Union, national curricular documents highlight the necessity of cognitive and non-cognitive elements of children's development, since the same are extremely important in establishing a durable base for life-long learning;
- most of the documents include behaviours to be acquired by children, objectives related to the targeted behaviours as well as suggestions for activities in support of attaining the objectives as set;
- educational entities offering early education services may work out their own educational programmes with an emphasis on various development areas however observing the stipulations as required by the framework curriculum, in the same time;
- availability of educational programmes specifically elaborated for children being 6 years of age, with of view of preparing them for the next educational stage, facilitating in this way the transition between the two, namely preschool and primary levels.

Differences that show great variations in terms of early education curriculum in the European Union member states are related to the age at which ECEC programmes can be started, the extent to which national stipulations are compulsory or not, and, respectively, the way how the same are formulated (in detail or broad lines).

In terms of *physical development*, all curricula of the European countries targeted in our study share a unitary vision, admitting the important role played thereby in the global development of children's personality.

Differences occur in the light of how the domain is approached. Certain countries such as Finland, Hungary and Romania adopt an analytical approach involving as follows: descriptions, actual contents, activities recommended for the physical development and motricity area, while others (for instance Spain, Germany), highlight only the general aspects thereof.

REFERENCES

Education International (EI). (2010). *Early childhood education: A global scenario.* Brussels. [Accesed on 02.06.2014] *http://download.ei-ie.org/Docs/WebDepot/ECE_A_global_scenario_EN.PDF*

European Commission. (2014). *Key Data on Early Childhood Education and Care in Europe.* Eurydice and Eurostat Report. Luxembourg.

Eurydice. (2007). *Magyarország oktatási rendszere*. [Accesed on 10.06.2014] *http://www.agronet.eu/index.php?option=com_docman&task=doc_download&gid=131&Itemid=75*

Eurydice, (2013). *The Education System in the Federal Republic of Germany 2011/2012.* [Accesed on 07.06.2014] *http://www.kmk.org/fileadmin/doc/Dokumentation/Bildungswesen_en_pdfs/dossier_en_ebook.pdf*

Finnish National Board of Education (FNBE). (2010). *National Core Curriculum for Pre-primary Education.* [Accesed on 04.06.2014] *http://www.oph.fi/english/education_system/early_childhood_education*

Lindeboom, G.-J., Buiskool, B.-J. (2013). Quality in early childhood education and care. Annex report country & case studies. *Directorate General for international policies,* European Union. *http://www.europarl.europa.eu/RegData/etudes/etudes/join/2013/495867/IPOL-CULT_ET(2013)495867(ANN01)_EN.pdf* [Accesed on 04.06.2014]

Ministerul Educaţiei, Cercetării şi Tineretului (MECT), (2008a). *Curriculum pentru educația timpurie a copiilor cu vârsta cuprinsă între naștere și 6/7 ani.* Bucureşti. *http://www.edu.ro/index.php/articles/10135* [Accesed on 04.11.2014]

MECT – Unitatea de Management al Proiectelor pentru Învăţământul Preuniversitar. (2008b). *Curriculum pentru educația timpurie a copiilor cu vârste cuprinse între naștere și 6/7 ani.* [Accesed on 10.07.2012] *http://proiecte.pmu.ro/c/document_library/get_file?p_l_id=16980&folderId=31565&name=DLFE-2701.pdf.*

National Research and Development Centre for Welfare and Health (STAKES). (2003). *National Curriculum Guidelines on Early Childhood Education and Care in Finland.* [Accesed on 04.06.2014] *http://www.oph.fi/english/education_system/early_childhood_education*

Organic Law on Education (LOE). (2006). *http://planipolis.iiep.unesco.org/upload/Spain/Spain_LOE_eng.pdf* [Accesed on 05.06.2014]