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CONTENT - SOMMAIRE - INHALT - CUPRINS

- RUDOLF PICHLER, JÁNOS TÓTH jr., JÁNOS TÓTH, Monitoring the Football Player's Running Speed in the U7 Range in Respect with Ball and Without Ball..... 5
- DAN MONEA, HOREA ȘTEFĂNESCU, RODICA PRODAN, An Evaluation of the Effects that Football-Specific Methods and Tests Have on the Skill Development in 10-12-year-old Children. A Case Study * *Evaluarea îndemânării în jocul de fotbal prin teste specifice la jucătorii în vârstă de 10-12 ani. Studiu de caz* 15
- DAN MONEA, RODICA PRODAN, HOREA ȘTEFĂNESCU, VLAD GROSU, Skill Development Using Football-Specific Methods and Tests for 10-12-Year-Old Children * *Dezvoltarea îndemânării prin metode și teste specifice jocului de fotbal la copiii de 10-12 ani*..... 25
- RADU-TIBERIU ȘERBAN, ALIN MARIUS BACIU, Effects of Recreational Tennis Practice on Information Technology Industry. Employees' Fitness – A Pilot Study * *Efectele practicării tenisului de câmp recreațional asupra indicilor formei fizice (fitness) a angajaților din industria tehnologiei informației. Un studiu pilot. Introducere*.....41

VASILE SEPTIMIU ORMENIȘAN, MARIA DANIELA MACRA OȘORHEAN, PAUL OVIDIU RADU, RADU ADRIAN ROZSNYAI, Study Regarding the Physical Activity Performed by First and Second-Year Students Enrolled at the Babeș-Bolyai University of Cluj-Napoca * <i>Studiu referitor la activitatea fizică desfășurată de studenții din anii întâi și doi ai Universității Babeș- Bolyai din Cluj-Napoca. Introducere</i>	49
ALEXANDRA-CRISTINA POP, GHEORGHE MONEA, ION-PETRE BARBOȘ, Implementing Aikido in Physical Activity Programs with 9-10 year-old Children * <i>Implementarea Aikido în programul de activități fizice la elevii de 9-10 ani</i>	57
PETRE I. BARBOȘ, RAREȘ-DUMITRU CIOCOI-POP, DAN CHERZOI, Ways of Improving Physical Qualities in Judo by Uchi Komi * <i>Variante de îmbunătățire a calităților fizice în judo prin Uchi Komi</i>	67
ISTVÁN KISS, ÁGOSTON NAGY, Subject-based Examination of the Hungarian Basketball Replacement - Education Due to the Sport Cultural Change of Attitude	75
HOREA ȘTEFĂNESCU, DAN MONEA, Mountain Bike Activity in Natural Areas. Impacts and Implications (Case Study: The Codrișor Forrest Park) * <i>Ciclismul montan: impact și implicații asupra zonelor naturale. Studiu de caz: Pădurea Codrișor</i>	85
RADU-TIBERIU ȘERBAN, ALIN MARIUS BACIU, Strategies for Increasing the Physical Fitness of Employees in the Workplace * <i>Strategii instituționale de creștere a nivelului formei fizice angajaților. Introducere</i>	97

MONITORING THE FOOTBALL PLAYER'S RUNNING SPEED IN THE U7 RANGE IN RESPECT WITH BALL AND WITHOUT BALL

RUDOLF PICHLER¹, JÁNOS TÓTH jr.^{1*}, JÁNOS TÓTH¹

ABSTRACT. The purpose of the study is to prove that, the ball exercises and the playful form of practice are more effective, than the “less ball exercises” practical training. The two participant groups in the measurement were Gyáli – BKSE U7 and Vecsési FC U7. The monitoring has been made with testing method technique (N=40). We used the slalom sprint and the slalom dribble. To determinate the difference we used the 2-sample t-test. The group of Gyál had a better result in slalom sprint. At the assessment in November, the improvement (0.39 second) was outstanding too and the in following months the improvement's rate showed almost the same tendency. The group's average improvement (0.96 second) progressed. At slalom dribble, the improvement of the group of Vecsés was continuous. The group's average improvement was 5.03 second. The group of Gyál's improvement was continuous as well but its rate is 3.22 seconds. The rate of improvement did not show any significant difference. Therefore, I cannot claim that this method causes much the largest improvement comparing to the traditional method. At both of the groups, the improvement is clearly demonstrable. Despite that the significant improvement is not demonstrable I am going to practise these playful exercises and recommend to my colleagues who work with this generation. Because with this exercises the trainings are more playful and vivid.

Keywords: *football, youth coaching, age group training*

Introduction

Nowadays, the focus is more and more on the role of new generations in the inland front rank and the junior clubs in the sight of technique and condition. For now, there are only a few research and study has been made referring to the rate of the results using different methods of trainings. Most of

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the researches do not even concern this range in general and the specialized literature barely analyses it. Since I am working with children at the age of kindergarten and elementary school for four years now, I thought it is necessary to confirm the rate of the development with facts.

What is the role of the range qualification in the inland rising generation? The training of the new generation is between the ages of 6-18 „The range qualification’s main part is considering the speciality of the age to build a standardized, back-to-back system, which aims to broaden the rising generation’s scooping boat, to reach the most optimal improvement” (Nádori, 1983, 1992; Famosi, 1999).

What does the philosophy say about the improvement: „The improvement is such a forward pointing procession which has a beginning and an ending point. (Bicskei, 1998) It is important to note that in a certain age which technical, tactical, conditional skills children could acquire (Zalka, 1991). It is necessary to be conscious of this building the limits of the expectations for the different ranges (Görtl, 2002). The range training is in an up-going system appertain to age from U7 until U19 (Andrew, 1996). The year of birth determines who belongs to which range (Tóth & ifj. Tóth, 2016).

In my experience, it is not fortunate in the U7 range because the same efficiency is not expectable from the children who were born in the early and in the late part of the year. At this age, a few months could make a big influence on the personal improvement, and that affects the whole group’s work. „The rate of the biological development could cause division at this age too. There are the early-developed children who are biologically more mature than their age and the retarded children who are less mature than their age” (Bicskei, 1998). In the view of the training the following aspects (Cabrini, 1999) are important at this age:

- learning by playing;
- having fun;
- make the child to like the sport;
- many sided skill training;
- touching the ball many times, lots of positive experience, huge self-confidence, many friends;
- technical, and slickness training;
- getting to know new techniques, exciting matches;
- ambidexterity(two-footedness), bilaterality;
- trying all the posts.

During my trainer career, I have had the chance to visit trainings in different clubs, and see different methods of training. Visiting the trainings at the front rank (Budapest Honvéd, Ferencváros, Vasas) groups' new generation trainings I experienced that the trainings synthesis followed the classical ideas, that the tasks with and without ball are separated. Through the discussions with my trainer colleagues, we more often talked about touching the ball as many times as it is possible. That is the reason why I had the idea to maintain the trainings at the Vecsés group from now only with ball to make an attempt. To follow this idea (at every task they had to touch the ball) even at the warm-up I gave them exercises connected to the ball.

Material and Methods

The used methodological exercises

Exercises to improve the movement coordination: normal tig, 30 seconds tig, follow the object, run away from the bear, catch the player with the bib, catch your partner. Exercises to develop the slickness with the connection between the ball and the feet: get the ball, swap the balls, collect the balls, bison hunting, zone swap, Simon Says, stage activity contests. Aiming exercises: stay away from the ball, knock over the cone, keep ball, and blast the ball. The game: one player against another to many goals, three players against three other to two goals. My assumption is that the exercises at Vecsés group caused more efficient technical development.

Groups involved in the research

I have been working with two groups at the same age using different methods of trainings and exercises to prove my statement. The vital part of this study is based on the different methods of training. The contrasting of the group's capacity will show the methods efficiency. Finally, I will compare the results of slalom sprint and the slalom dribble. Choosing the tests I considered the motor skills and that the children who attended the trainings- motor performance capacity is only describable if we measure the conditional and the coordination skills together. The two participant groups in the measurement were Gyáli –BKSE U7 and Vecsési FC U7. The attendants were 5-6 years old boys. The monitoring has been made with testing method technique (N=40). This monitoring started in October 2015 and finished in April 2016. It shows the results of assessment of six months (November, December, January, February, March, April). The results of October shows the starting rates, so that is the basis of all results. With the monitoring method of Gyáli – BKSE U7 (N = 20 person), Vecsési FC U7 (N = 20 person).

Table 1. Test groups, made by: János Tóth jr.

Team	Number of player	Proportion		Average age
		5 years old / 6 years old		
Gyáli – BKSE U7	20	8 player (40%)	12 player (60%)	5,6 year
Vecsési FC U7	20	11 player (55%)	9 player (45%)	5,45 year

The participant children are all boys at both group. At Gyáli – BKSE U7 the age is 5-6, its proportion is 5 years olds are 8 persons, 40%, 6 years olds 12 persons, 60 %, average is 5,6 years old. At Vecsési FC U7 the age is 5-6, it's proportion is 5 years olds are 11 persons, 55%, 6 years olds 9 persons, 45 %, average is 5,45 years old.

The place and period of research

The trainings at both groups are two times in a week on Tuesdays and Thursdays for one hour. At Gyál it is from 5pm until 6 pm and at Vecsés it is from 3pm until 4 pm. At the group of Gyál they followed the universal method of training to improve the movement coordination with the following exercises: speed and agility drills, tig, balance exercises, stage activity contests from various postures, dexterity exercises with ball (dribbling with fun related drills). The training method at Vecsés is only different from the method above that the children had to do the exercises only with ball. At both groups, trainings are held outside, on fields in the fall season (September, October, November). During the winter (December, January, February) the trainings are in closed place, gym, with plastic surface. The assessments were only held in the closed gym with plastic surface. The assessments were held outside of the training hours, with monthly regularity. At each assessment I explained and presented the exercise, they had to do.

The children wore flat gym shoes, which I checked before the assessments. The assessment took 60 minutes in average with each group, at each time. I continually aimed to guarantee 100% results of the assessment by providing each participant children to have a result. Those children who could not appear at the time of the assessment they could cover it at another time out of the training hours. When choosing the tests, I primarily considered these aspects: they are well founded by the requirements of the tests' conception, eligible according to the speciality of the age, performable at a certain place and in a certain conditions. I was intent on formalize the assessments a happy and frisky activity.

There is a condition of the repetition of the test that the basic test, the method of measurement, the monitored persons, the head of the assessment, and the conditions do not change.

Tests Used

I choose two tests, the slalom sprint for coordination assessment and the slalom dribble for the technical assessment.

Slalom sprint: I put cones sheer onto the mark 5, 10 and 15 meters away. The sportsman evade the cones in an undulatory line first, than getting around the third cone runs back in an undulatory line and pass the mark. I measured the exercise on the 0,01 second.

Slalom dribble: the participant has to slalom dribble on the field. I put cones sheer onto the mark 5, 10 and 15 meters away. The sportsman evade the cones in an undulatory line first dribble, than getting around the third cone runs back in an undulatory line dribble and stop the ball on the finish line (which is the mark as well). I measured the exercise on the 0,01 second.

At the slalom sprint children line up behind the mark, begins with the pips and in the same time the timer starts, and finishes when the mark is stepped over. In case of irregular start or irregularly performed exercise, the exercise has been repeated. After this, the result was immediately documented.

At slalom dribble children line up behind the mark, begins with the pips and in the same time the timer starts, and finishes when the ball is stopped at the mark. In case of irregular start or irregularly performed exercise, the exercise has been repeated. After this, the result was immediately documented.

Equipment: Equipment used during the assessment: 50 meters long sport tape, 6 pieces of 38,1 cm tall, tapered with plastic cone, leather football at size of 3, timer, Fox 40 whistle.

Hypothesis

Nowadays, more and more high-ranked sports clubs have emphasized the importance of the method of touching the ball as many times as possible in youth coaching of footballers. I consider applying my method to be more efficient with better technical results in case of the team in Vecsés than that of the team in Gyál.

Results

In the assessment of the speed development the slalom sprint, and in the assessment of the technical development the slalom dribble gave the results of the tests.

Slalom Sprint

The results and the analysis of the slalom sprint assessment at Vecsési FC U7, Gyáli BKSE U7:

Table 2. Gyáli BKSE U7, Vecsési FC U7 slalom sprint, made by: Rudolf Pichler

	October	November	December	January	February	March	April
Vecsés:	9,66	9,34	9,37	9,10	8,95	8,89	8,87
Improvement		0,32	0,29	0,56	0,71	0,77	0,79
Gyál:	10,05	9,66	9,59	9,56	9,31	9,32	9,09
Improvement		0,39	0,46	0,50	0,74	0,73	0,96

At Gyáli BKSE U7 the average rate in the beginning was 10,05 seconds, the last one is 9,09 seconds, which means the average improvement is 0,96 seconds. It causes 9,60 % improvement. The difference between the basic rate and the first assessment shows a 0,39 seconds improvement. The difference between the basic rate and the second assessment is 0,46 seconds. The difference between the basic rate and the third assessment is 0,50 seconds. The difference between the basic rate and the fourth assessment is 0,74 seconds. The difference between the basic rate and the fifth assessment is 0,73 seconds.

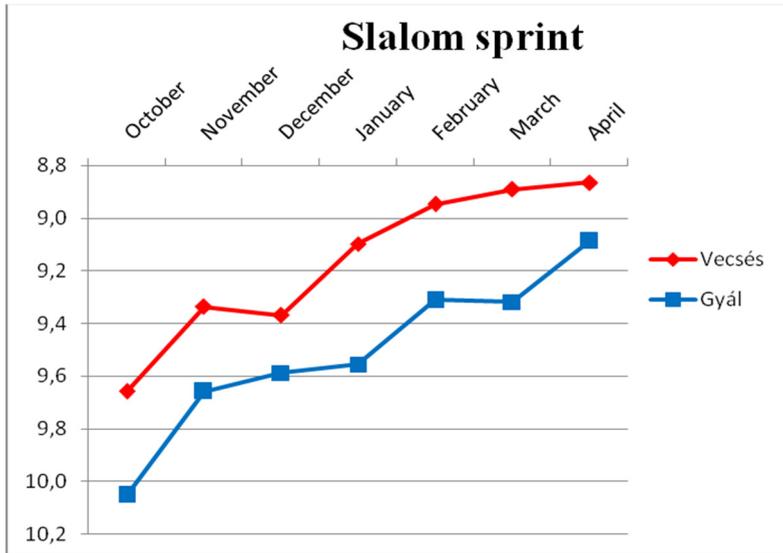
The difference between the basic rate and the last assessment is 0,96 seconds.

At the personal assessments the most significant result shows 2,16 seconds improvement, it is 22,8 % improvement. The smallest improvement is 0,04 seconds and it is a 0,4 % improvement. Nine persons improvement is above the average (9,60 %) in the group and eleven persons improvement is under the average, it is a 45-55% division.

At Vecsési FC U7 the average rate in the beginning was 9,66seconds, the last one is 8,87 seconds which means the average improvement is 0,79 seconds. It causes 8,20 % improvement. The difference between the basic rate and the first assessment shows a 0,32seconds improvement. The difference between the basic rate and the second assessment is 0,29seconds. The difference between the basic rate and the third assessment is 0,56 seconds. The difference between the basic rate and the fourth assessment is 0,71seconds. The difference between the basic rate and the fifth assessment is 0,77seconds.

The difference between the basic rate and the last assessment is 0,79 seconds. At the personal assessments the most significant result shows 1,67seconds improvement, it is 16,5 % improvement. The smallest improvement is 0,14 seconds and it is a 1,6 % improvement. Eleven persons improvement is above the average (8,20 %) in the group and nine persons improvement is under the average, it is a 55-45% division. (Table2, Graph1)

Graph 1. Gyáli BKSE U7, Vecsés FC U7 slalom sprint, made by: Rudolf Pichler



Slalom Dribble

The results and the analysis of the slalom dribble at Vecsési FC U7, Gyáli BKSE U7:

Table 3. Gyáli BKSE U7, Vecsés FC U7 slalom dribble, made by: Rudolf Pichler

	October	November	December	January	February	March	April
Vecsés:	22,03	20,64	20,62	19,18	18,99	18,41	17
Improvement		1,39	1,41	2,85	3,04	3,62	5,03
Gyál:	19,2	18,35	17,3	17,08	16,83	16,67	15,98
Improvement		0,85	1,90	2,12	2,37	2,53	3,22

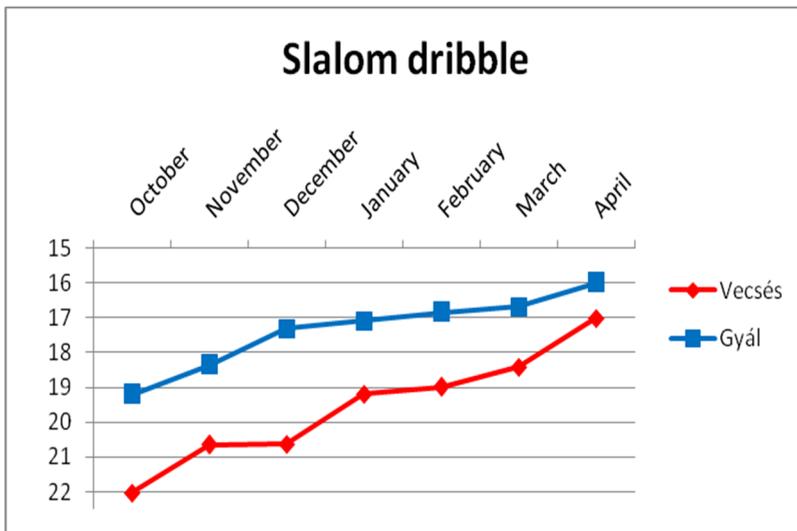
At Gyáli BKSE U7 the average rate in the beginning was 19,20 seconds, the last one is 15,98 seconds, which means the average improvement is 3,22 seconds. It causes 16,80 % improvement. The difference between the basic rate and the first assessment shows a 0,85 seconds improvement. The difference between the basic rate and the second assessment is 1,90 seconds. The difference between the basic rate and the third assessment is 2,12 seconds. The difference between the basic rate and the fourth assessment is 2,37 seconds. The difference between the basic rate and the fifth assessment is 2,53 seconds.

The difference between the basic rate and the last assessment is 3,22seconds. At the personal assessments the most significant result shows 8,62 seconds improvement, it is 39,2 % improvement. The smallest improvement is 1,5 seconds and it is a 7,1 % improvement. Twelve persons improvement is above the average (16,8%) in the group and eight persons improvement is under the average, it is a 16,8 % division. (Table 3, Graph 2)

At Vecsés FC U7 the average rate in the beginning was 22,03seconds, the last one is 17,01 seconds, which means the average improvement is 5,03 seconds. It causes 22,80 % improvement. The difference between the basic rate and the first assessment shows a 1,39seconds improvement. The difference between the basic rate and the second assessment is 1,39seconds. The difference between the basic rate and the third assessment is 2,85seconds. The difference between the basic rate and the fourth assessment is 3,04seconds. The difference between the basic rate and the fifth assessment is 3,62seconds.

The difference between the basic rate and the last assessment is 5,03seconds. At the personal assessments the most significant result shows 9,66 seconds improvement, it is 40,2% improvement. The smallest improvement is 0,43 seconds and it is a 2,1 % improvement. Twelve persons improvement is above the average (13,8 %) in the group and sixteen persons improvement is under the average, it is a 80-20 % division. (Table 3, Graph 2)

Graph 2. Gyáli BKSE U7, Vecsés FC U7 slalom dribble made by Rudolf Pichler



Conclusion

This study aim to point out the opportunities of the improvement in Hungarian football's rising generations and particularly in the youngest age. Setting the international standard as an example, we can understand the opportunity of the improvement in the coordination of movement and in the technical skills. The ability to learn movements of the nervous system is significantly high at this age. The primary task is to guarantee the children's need of movement with games as a material, the various reiteration of games, improving the sense of the ball, ensure the regular experience of success. The suitable qualification give us rope to accomplish the realization of state (even if it is elementary) and the solution of state. Characteristically he groups of 10-15 persons are able to achieve efficient outcomes in the field of movement coordination and the techniques.

The difficulties of the chosen tests are well proportioned to the speciality of this age. The results of this assessment points out its rates at this age. Each groups standards show complex improvement without exception. My aim was by using two different methods of training to show a measurable result through the tests about the efficiency of this method. As it was expected at Vecsés group the technical improvement was more efficient where I used the exercises with ball as it is written above. I was expecting a bigger rate between the difference of the improvement but significant (rate of signification $P = 0,05$) improvement is not demonstrable.

In order to determinate the difference I used the 2-sample t-test. For the proper preparation, I intentionally chose such game with ball, which causes the most optimal result. Comparing the average record of the two groups at slalom sprint the rate of improvement was almost the equal. At Vecsés SE U7 the footballers improvement were more impressive in November, the interesting fact is that in this group in December there is a minor (0,03 second) drop. At the last assessment in April there is outstanding improvement. The average improvement of the group is 0,79 second comparing the basic rate.

The group of Gyál had a better result in slalom sprint. At the assessment in November the improvement (0,39 second) was outstanding too and the in following months the improvement's rate showed almost the same tendency. The group's average improvement (0,96 second) progressed.

At slalom dribble, the improvement of the group of Vecsés was continuous. The group's average improvement was 5,03 second. The group of Gyál's improvement was continuous as well but its rate is 3,22 second. The hypothesis that the improvement is more successful through exercises with ball is verified. However, the rate of improvement did not show any significant difference. Therefore, I cannot claim that this method causes much the largest improvement comparing to the traditional method. At both of the groups, the improvement is

clearly demonstrable. Despite that the significant improvement is not demonstrable I am going to practise these playful exercises and recommend to my colleagues who work with this generation. Because with this exercises the trainings are more playful and vivid.

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AN EVALUATION OF THE EFFECTS THAT FOOTBALL SPECIFIC METHODS AND TESTS HAVE ON THE SKILL DEVELOPMENT CASE STUDY IN 10-12 -YEAR-OLD CHILDREN

DAN MONEA^{1*}, HOREA ȘTEFĂNESCU¹, RODICA PRODAN¹

ABSTRACT. Over time, the sport team's game philosophy has evolved according to the new requirements of the game. In the overall evolution of the game and its elements, in the course of the permanent changes of orientation and accent, the physical training was an element of progress for the other factors of the training. Physical training sums up strength, speed, skill and mobility.

Keywords: *means, methods, skill, abilities, technique*

REZUMAT. *Evaluarea îndemânării în jocul de fotbal prin teste specifice la jucătorii în vârstă de 10-12 ani – studiu de caz.* Concepția de joc a echipelor evoluat de-a lungul timpului în funcție de noile cerințe ale jocului. În ansamblul evoluției factorilor de joc, a jocului însuși, în cadrul permanentelor schimbări de orientare și accent, pregătirea fizică a reprezentat un element de progres pentru ceilalți factori ai antrenamentului. Un element de structură foarte important al pregătirii fizice este reprezentat de calitățile motrice: forța, viteza, rezistența, îndemânarea și mobilitatea.

Cuvinte-cheie: *mijloace, metode, îndemânare, abilități, tehnică*

Introduction

Among these elements, this paper aims to analyze the skill generally, but also is focusing on the football game. The paper's area of interest belongs to the generic concerns of overall optimizing the lesson of physical education, especially the development of motor skills. The efficiency of some drives for skill development gives the practical value of the paper and highlights the effectiveness of them in the physical education lesson.

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Hypothesis

Starting from the premise that motor skills development approached by the modern methods and specific means of the football game can lead to an efficiency increase in the instructive-educational process, confirmed by greater manifestation indices of the motoring qualities. An experimental study must confirm or invalidate the fact that students who systematically practice football in physical education classes, extracurricular activities and school sports competitions have higher morpho-functional developmental indices and better physical and motor development. The aim of the paper is to develop the specific driving skill in the football game during the class of physical education and sport at the 5th grade.

Objectives

- Carrying out a theoretical analysis of the motor skills: skill and specific aspects of skill in football game.
- Developing drive systems designed to increase skill specific to football game.
- Practical reasoning of the skill development of: skill.

Means and methods

1. Study of bibliography, observation method, experimental study, graphic method

Experiment: Subjects who participated in this research were 20 pupils of the fifth grade in the school year 2015-2016 at the secondary school Ion Creangă in Cluj-Napoca. The 20 subjects were then distributed in two groups, one being the experimental group and the other the control group.

Table 1. Results of Experimental Group Test-I Test Applicants (Initial Testing)

No.	First name and last name	Test result (seconds)
1.	A.E.	16,4
2.	B.C.	16,8
3.	B.S.	14,4
4.	B.B.	13,8
5.	B.D.	14,9
6.	C.G.	14,1
7.	C.C.	15,3
8.	C.P.	16,2
9.	F.T.	14,3
10.	G.E.	14,6

Table 2. Results of Witness Test Subjects on Test I- Applicable Route (Initial Testing)

No.	Name and surname	Test result (seconds)
1.	M.D.	14,5
2.	M.R.A.	15,3
3.	N.D.	14,8
4.	M.R.	13,9
5.	M.I.	16,5
6.	P.A.	15,7
7.	R.S.	15,8
8.	S.F.	13,8
9.	S.A.	16,1
10.	U.R.	16,3

Table 3. Statistical Tables in Test I (Initial Testing)

Application course								
Group	X	S	m	Cv	Student		ANOVA	
					t	P	F	P
Experi- mental	15.08	3.312	1.047	21.962	0.137	>0.05	1.563	>0.05
Control	15.27	2.86	0.904	18.729				

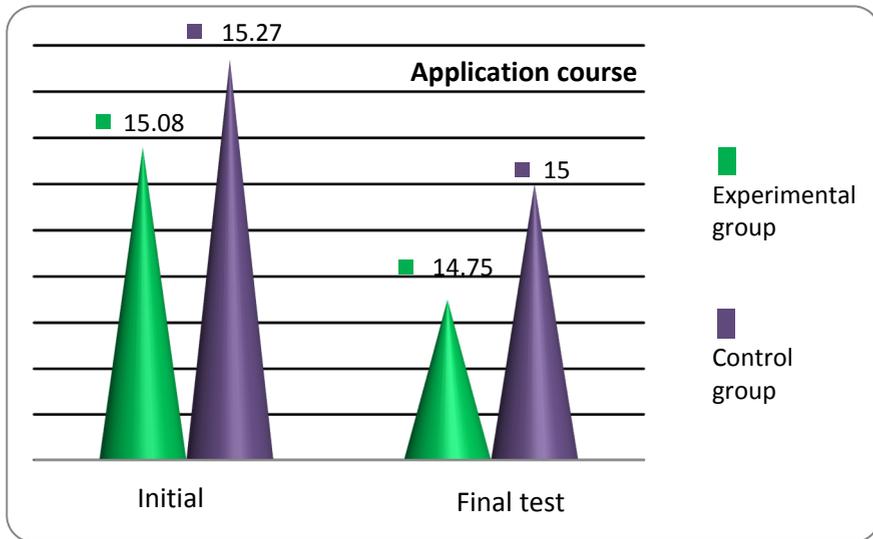


Figure 1. Application course - Average values for the two tests

Table 4. Results of Experimental Group on Test I-Application Run (Final Test)

No.	First name and last name	Test result (seconds)
1.	A.E.	16,1
2.	B.C.	16,5
3.	B.S.	14,1
4.	B.B.	13,2
5.	B.D.	14,7
6.	C.G.	13,8
7.	C.C.	15,1
8.	C.P.	15,9
9.	F.T.	13,8
10.	G.E.	14,3

Table 5. Results of Test Group 2 Test Subjects - Application Course (Final Test)

No.	First name and last name	Test results (seconds)
1.	M.D.	14,2
2.	M.R.A.	15,1
3.	N.D.	14,6
4.	M.R.	13,6
5.	M.I.	16,3
6.	P.A.	15,4
7.	R.S.	15,5
8.	S.F.	13,4
9.	S.A.	16,1
10.	U.R.	15,8

Table 6. Statistical Tables in Test I (Initial-Final Test)

Application course											
Group		X	S	m	Cv	Student initial		Student final		ANOVA	
						t	P	t	P	F	P
Experi- mental	Initial test	15.08	3.312	1.047	1.962	2.816	<0.05	3.231	<0.05	5.258	<0.05
	Final test	14.75	3.675	1.162	24.91						
Control	Initial test	15.27	2.86	0.904	18.729	1.869	>0.05	3.231	<0.05	5.258	<0.05
	Final test	15	3.093	0.978	0.62						

The average values indicate a few seconds improvement of the values recorded between the tests at both groups, significant improvement only for the experimental group:

Experiment group: $t(9)=6.353 > 2.262$

Control group: $t(9)=2.143 < 2.262$

Homogeneity improves in both groups, more significant in the control group;

The significant differences between the two groups from the final testing are highlighted by the values of t and F:

$$T(18) = 3.231 > 2.1009$$
$$F(1,18) = 5.258 > 4.413$$

**Analytical Graphical Representation - Applicative Course
(shows the difference between the two tests held in October and May)**

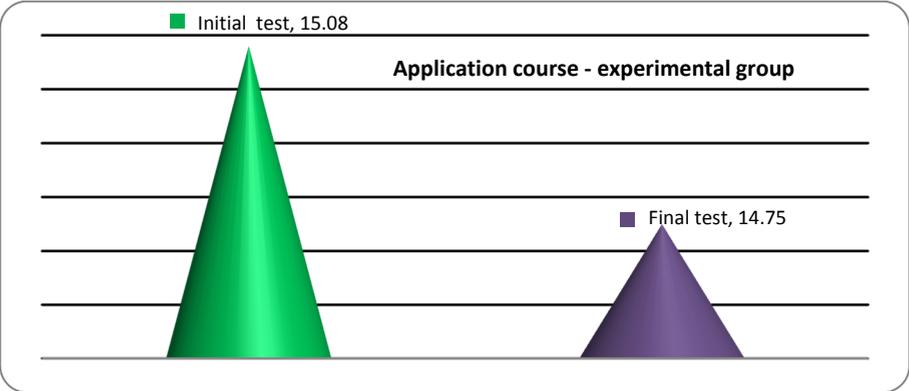


Figure 2. Application-experiment group-average values for the two tests

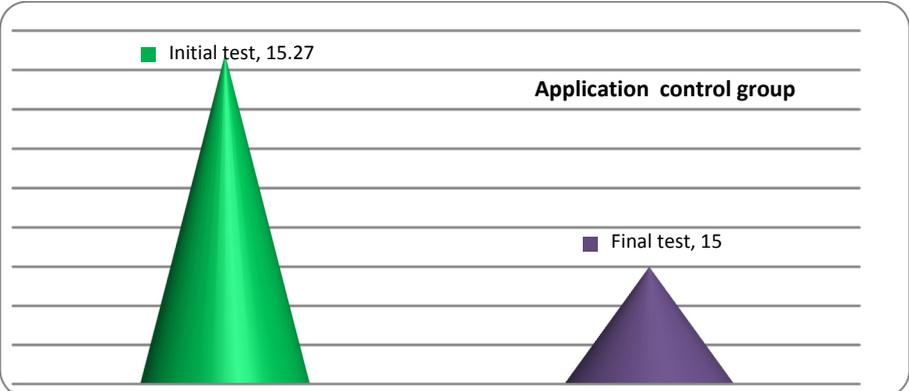


Figure 3. Application run-control group-average values for the two tests

Table 7. Nominal Table with Results of Experimental Group II Tests -
Foot kick on Vertical Target (Initial Test)

No.	First name and last name	Test results (points)
1.	A.E.	8
2.	B.C.	7
3.	B.S.	12
4.	B.B.	7
5.	B.D.	6
6.	C.G.	8
7.	C.C.	9
8.	C.P.	6
9.	F.T.	8
10.	G.E.	9

Table 8. Nominal Table with Results of Control Group on Test Group III -
Foot kick on Vertical Target (Initial Test)

No.	First name and last name	Test results (points)
1.	M.D.	5
2.	M.R.A.	8
3.	N.D.	7
4.	M.R.	12
5.	M.I.	6
6.	P.A.	6
7.	R.S.	8
8.	S.F.	13
9.	S.A.	8
10.	U.R.	11

Table 9. Statistical indices on Second Test (Initial Test)

Foot kick on Vertical Target								
Group	X	S	m	Cv	Student		ANOVA	
					t	P	F	
Experimental	8	9.33	2.95	11.66	0.063	>0.05	1.243	>0.05
Control	8.4	17.46	5.52	20.78				

It can be observed that arithmetic mean values of the results obtained by the two groups are very close, with differences between 0.19 and 2.5 points. Moreover, it is observed a very good homogeneity, with better results of the variation coefficient between the two tests in the case of the control group.

The significance tests have provided values for t and F far below their reference ($t=2.1009$ and $F=4.4138$), strengthening the assumption that there are no significant differences between the two groups.

Table 10. Nominal Table with Results of Experimental Group II Test Subjects - Foot kick on Vertical Target (Final Test)

No.	First name and last name	Test results (points)
1.	A.E.	11
2.	B.C.	9
3.	B.S.	13
4.	B.B.	10
5.	B.D.	9
6.	C.G.	11
7.	C.C.	12
8.	C.P.	9
9.	F.T.	11
10.	G.E.	11

Table 11. Nominal Table with Results of Control Group II Test Subjects - Foot kick on Vertical Target (Final Test)

No.	First name and last name	Test results (points)
1.	M.D.	6
2.	M.R.A.	9
3.	N.D.	9
4.	M.R.	12
5.	M.I.	7
6.	P.A.	8
7.	R.S.	8
8.	S.F.	14
9.	S.A.	8
10.	U.R.	12

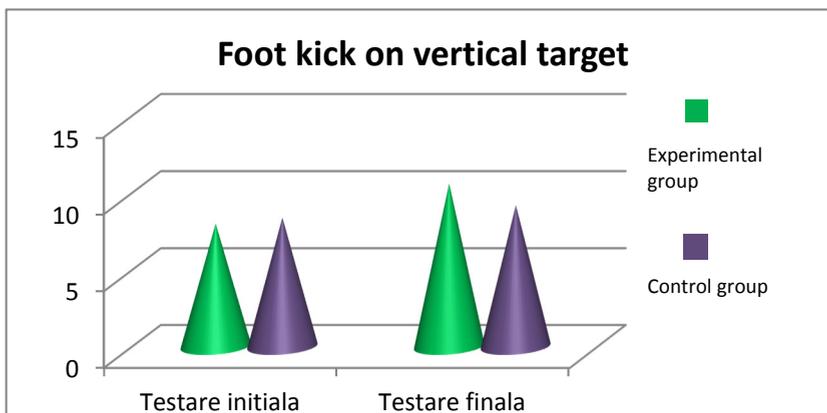


Figure 4. Foot kick on target – mean values for the two tests

Table 12. Statistical indices on test III (initial-final)

Foot kick on vertical target											
Group		X	S	m	Cv	initial-final		final		ANOVA	
						t	P	t	P	F	P
Experimental	Initial test	8	9.33	2.95	11.66	2.745	<0.05	3.253	<0.05	5.989	<0.05
	Final test	10.6	5.466	1.728	5.156						
Control	Initial test	8.4	17.46	5.52	20.78	2.324	<0.05	3.253	<0.05	5.989	<0.05
	Final test	9.2	12.5666	3.973	13.586						

Arithmetic mean shows an increase in both groups between tests (2.6 points in the experimental group and 0.8 points in the control group), significant for both groups:

Intervention group: $t(9)=2.745>2.262$

Control group: $t(9)=2.324>2.262$

Homogeneity shows an improvement in both groups of 6 and 7 percentage points respectively.

The significant differences between the two groups are evidenced by the two tests, meaning:

$$t(18)=3.253>2.1009$$

$$F(1,18)=5.989>4.413$$

Analytical Graphic Representation – Foot Kick on Target (Shows the Difference of the Results between the Two Tests October-May)

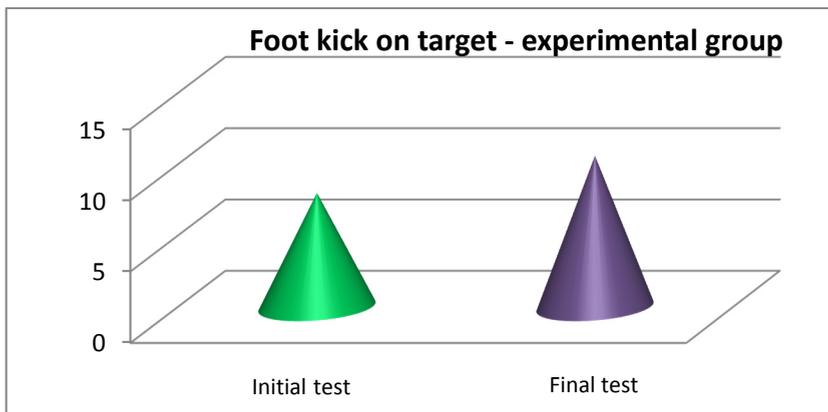


Figure 5. Foot kick on target - experimental group – mean values for the two tests

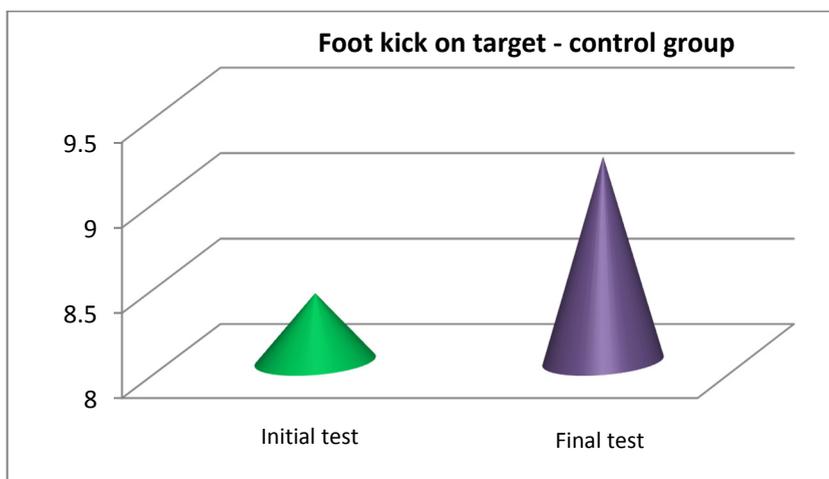


Figure 6. Foot kick on target - control group – mean values for the two tests

Conclusion and suggestions

Following the elaboration and systematization of the materials presented in this paper, the authors reached out to the next conclusions:

- Starting from the fact that football is a means of physical education, it is considered that within the physical education classes the age-appropriate football exercises can be used to achieve the goals of better motor skills and abilities.
 - By applying the tests, it was found an increase in general physical development indices.
 - Due to the morpho-functional particularities of the 10-12 year old students referred to in the present paper, it can be said that our proposal is an appropriate one for the development of motor abilities and especially of the skill.
 - The somatic development level determines the necessary time period for the acquisition of the technical procedures that contribute to the development of the skill.
 - After viewing the tables and graphs, it is observed an increase in the values obtained by the two test groups between the initial and the final testing.
 - The progress of the experimental group compared to the control group is significant, allowing the authors to say that for the optimization of skill, the specific means of football can successfully replace the classic ones.

- By raising the fitness level of the two groups of students included in the proposed experiment, the authors consider that the research objectives have been achieved, the efficiency of the applied methodological system has been demonstrated.

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SKILL DEVELOPMENT USING FOOTBALL SPECIFIC METHODS AND TESTS FOR 10-12 - YEAR-OLD CHILDREN

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HOREA ȘTEFĂNESCU¹, VLAD GROSU²

ABSTRACT. The team's conception has evolved over time according to the new requirements of the game. In the overall evolution of the game factors and of the game itself, in the course of the permanent changes of orientation and accent, the physical training was an element of progress for the other factors of the training. Some important elements of physical training are strength, speed, skill and mobility.

Keywords: *means, methods, skill, abilities, technique*

REZUMAT. *Dezvoltarea îndemnării prin metode și teste specifice jocului de fotbal la copiii de 10-12 ani.* Concepția de joc a echipelor a evoluat de-a lungul timpului în funcție de noile cerințe ale jocului. În ansamblul evoluției factorilor de joc, a jocului însuși, în cadrul permanentelor schimbări de orientare și accent, pregătirea fizică a reprezentat un element de progres pentru ceilalți factori ai antrenamentului. Un element de structură foarte important al pregătirii fizice este reprezentat de calitățile motrice forța, viteza, rezistența, îndemnarea și mobilitatea.

Cuvinte-cheie: *mijloace, metode, îndemânare, abilități, tehnică*

Introduction

Among these elements, this paper aims to analyse the skill generally, but also is focusing on the football game. The topicality of the paper lies in the fact that it is in line with the concerns of optimizing the lesson of physical education in all its aspects, including the development of motor skills. Especially as a form of expression, skill is the "quality that allows us to coordinate complicated

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movements and assures the rapid acquisition of skills and their improvement, as well as their use according to requirements and adaptation to various situations." (Hirtz, 2004) From other authors' perspective, skill is "the man's ability to perform acts and actions with a superior degree of coordination in terms of efficiency and with minimal energy and nervous consumption." (Dragomir&Scarlat, 2004)

The practical value of the paper is that it demonstrates the efficiency of some drives for skill development, and highlights the effectiveness of skill development in the physical education lesson. By the specifics of the used methods / objects, football play contributes to achieving the goals of physical education and sports, but for the harmonious physical development of the students are also necessary means of gymnastics and athletics (Neța, Popovici&Popovici, 2010).

Due to Matveev & Novicov (1980), skill is defined "first of all as an ability to quickly acquire new movements and secondly as an ability to quickly restructure the driving activity according to circumstances that change sharply." The ball and ball less methods of football have a wide applicability in the development of skill both in the physical education lesson and in the training lessons in other sports. Reciprocity between the means of physical education and sport is revealed by the contribution to the formation of a sports education by the first ones and the introduction of the technical procedures in sport into the system of the means of physical education.

The EWMN method was chosen because of its ability to create complex and simultaneous motion sequences that characterize exercise. EWMN is the work of Prof. Noa Eshkol in collaboration with Prof. Abraham Wachmann of Israel, published in 1958. EWMN is a scoring method that proposes a system of symbols representing the basic values describing human movements in time and space.

The method starts from the premise that physical phenomena of the movement can be analysed and translated into symbols within a concise system of well-defined symbols (Eshkol & Wachmann, 1958). The Matorin test consists in making separation of the body with its rotation in the air, after a jump, in the direction chosen by the subject. The size of the rotation is measured in degrees, as shown in Figure 1.

The test is carried out by tracing a line of 35 m on the ground, oriented in the north-south direction, the subject stand with the soles of each side of this line. It is required that the subject does not lose balance during the test, land in approximately the same place and position as the starting point.

The practice of playing football in other sports disciplines, and reciprocal training of footballers with means from other sports branches, reinforces the idea that for the complex training of a sportsman only the means of that discipline are not sufficient.

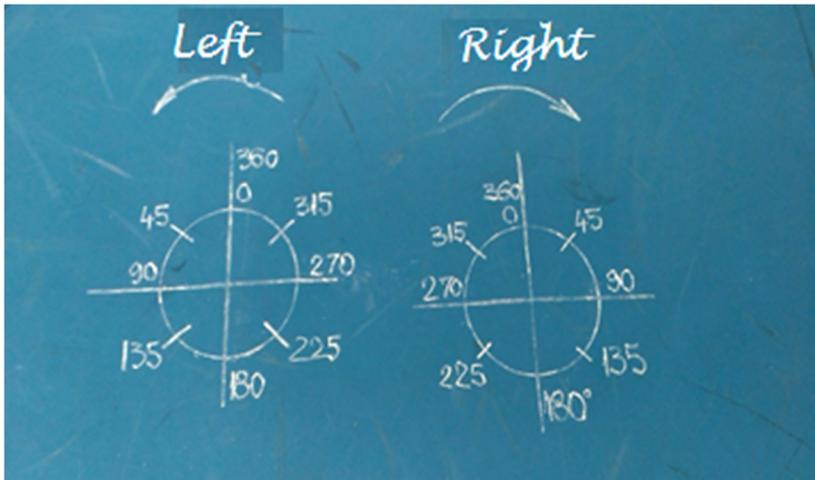


Figure 1. Measuring scale Matorin test

Hypothesis

Starting from the premise that motor skills development approached by the modern methods and specific means of the football game can lead to an efficiency increase in the instructive-educational process, confirmed by greater manifestation indices of the motoring qualities.

An experimental study must confirm or invalidate the fact that students who systematically practice football in physical education classes, extracurricular activities and school sports competitions have higher morphological-functional developmental indices and better physical and motor development.

The aim of the paper is to develop the specific driving skill in the football game during the class of physical education and sport at the 5th grade.

Objectives

Carrying out a theoretical analysis of the motor skills: skill and specific aspects of skill in football game.

- Developing drive systems designed to increase skill specific to football game.
- Practical reasoning of the skill development of: skill.

Means and methods

1. Study of bibliography, observation method, experimental study, graphic method

Experiment: Subjects who participated in this research were 20 pupils of the fifth grade in the school year 2015-2016 at the secondary school Ion Agârbiceanu Alba Iulia. The 20 subjects were then distributed in two groups, one being the experimental group and the other the control group.

Table 1. Results of Test Group Subjects on Test I-Matorin Test (Initial Test)

No.	First Name and First Name	Jump to the left (degrees)	Jump to the right (degrees)
1.	A.E.	270	270
2.	B.C.	270	270
3.	B.S.	360	315
4.	B.B.	270	315
5.	B.D.	225	270
6.	C.G.	315	315
7.	C.C.	270	315
8.	C.P.	270	270
9.	F.T.	315	270
10.	G.E.	315	315

Table 2. Results of Witness Group Tests on Test I – Matorin Test (Initial Testing)

No.	Last Name and First Name	Jump to the left (degrees)	Jump to the right (degrees)
1.	M.D.	270	315
2.	M.R.A.	315	315
3.	N.D.	315	270
4.	M.R.	270	270
5.	M.I.	270	315
6.	P.A.	270	315
7.	R.S.	270	315
8.	S.F.	270	360
9.	S.A.	270	360
10.	U.R.	180	315

The results obtained in the initial testing of the three applied tests confirm this assumption, the differences being insignificant in the analysed indicators, as can be seen from the centralizing tables presented below.

Table 3. Matorin test statistics (left)

Matorin Test (jumping on the left)								
Group	X	S	m	Cv	Student		ANOVA	
					t	P	F	P
Experimental	269.5	32.789	10.366	12.164	0.189	>0.05	1.458	>0.05
Control	267	25.733	8.137	9.638				

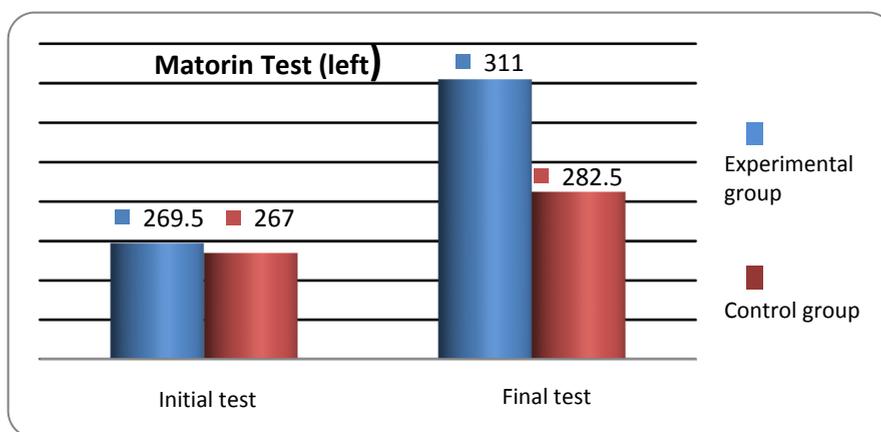


Figure 2. Matorin Test (left) - Average values for the two tests

Table 4. Statistical indexes from Matorin test (right)

Matorin Test (jump to the right)								
Group	X	S	m	Cv	Student		ANOVA	
					t	P	F	P
Experimental	272	23.944	7.571	8.803	0.670	>0.05	1.987	>0.05
Control	264	29.135	9.213	11.036				

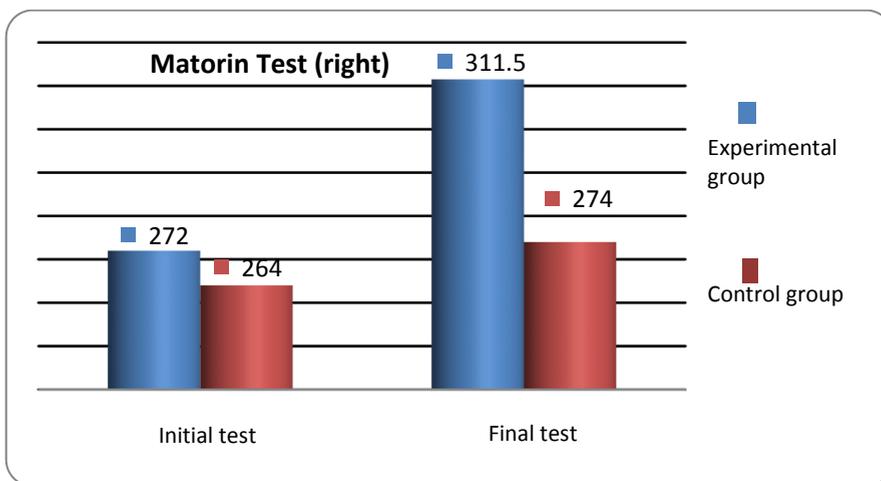


Figure 3. Matorin Test (right) - Average values for the two tests

Table 5. Results of Expert Group Test Group I Test - Matorin Test (final test)

No.	First name and last name	Jumping with turning to the left side (degrees)	Jumping with turning to the right side (degrees)
1.	A.E.	315	270
2.	B.C.	270	315
3.	B.S.	360	345
4.	B.B.	315	315
5.	B.D.	270	315
6.	C.G.	345	315
7.	C.C.	315	315
8.	C.P.	315	315
9.	F.T.	345	315
10.	G.E.	345	315

Table 6. Results of Witness Group Test Group I Test - Matorin Test (Final Test)

No.	First name and last name	Jumping with turning to the left side (degrees)	Jumping with turning to the right side (degrees)
1.	M.D.	300	270
2.	M.R.A.	300	315
3.	N.D.	315	270
4.	M.R.	300	300
5.	M.I.	315	315
6.	P.A.	270	345

No.	First name and last name	Jumping with turning to the left side (degrees)	Jumping with turning to the right side (degrees)
7.	R.S.	315	315
8.	S.F.	315	360
9.	S.A.	300	360
10.	U.R.	225	315

Due to the natural growth and development of the investigated subjects in both groups that occur between the two performed tests, some somatic, functional enhancements and even a better motricity can be observed. In addition, physical education emphasizes the development process overall and our approach must demonstrate that the applied methodology is effective. We will further demonstrate that the progress rate and its dynamics is significantly different in the experimental group compared to the control group, a fact revealed by the computed statistical indicators for each test and their corresponding diagrams.

For the centralized data in the tables below, we make the following remarks:

- M represents the control group and E the experimental group;
- IT is the initial test, and TF final test;
- Initial-final student is the result of the T test applied to one of the groups for the two tests;
- Final Student is the T test for final testing, applied for both groups;
- t represents the experimentally determined value during the T test;
- F represents the value recorded by the ANOVA method at the final test for the two groups;
- the critical value of F in the Fisher table used with the significance threshold of 0.05 having 1 and 18 degrees of freedom and computed with the FINV () function of the Microsoft Excel software is 4.4138 ($F(0.05, 1, 18) = 4.4138$);
- the critical values of t in the Fisher table used with the significance threshold of 0.05 and computed using the TINV () function in the Microsoft Excel software are presented as follows:
 - for initial T-test $T = 2.262$ for 9 degrees of freedom;
 - for final T-test $T = 2.1009$ for 18 degrees of freedom;
- P represents the significance threshold; the one used by us is 0.05.

Table 7. Statistical indices in the Matorin test (left)

Matorin Test (left)											
Group		X	S	m	Cv	Initial-Final Student		Student final		ANOVA	
						t	P	t	P	F	P
Experimental	Initial test	269.5	32.782	10.366	12.164	5.326	<0.05	2.334	<0.05	5.352	<0.05
	Final test	311	29.79	9.42	9.58						
Control	Initial test	267	25.733	8.137	9.638	2.435	<0.05	2.334	<0.05	5.352	<0.05
	Final test	282.5	24.54	7.76	8.68						

- mean values show an increase between tests by 41.5 degrees in the experimental group and by 15.5 grades in the control group, significant for both groups:

Experimental group: $t(9)=5.326 > 2.262$

Control group: $t(9)=2.435 > 2.262$

- the coefficient of variation reveals a higher homogeneity than in the initial testing in both groups, more pronounced in the first one;
- the values of t and F in the final test confirm the significant differences between the two groups:

$t(18)=2.334 > 2.1009$

$F(1,18)=5.352 > 4.413$

Table 8. Matorin test statistics (right)

Matorin Test (right)											
Group		X	S	m	Cv	Initial-Final Student		Final Student		ANOVA	
						t	P	t	P	F	P
Experimental	Initial test	272	23.944	7.571	8.803	6.353	<0.05	3.144	<0.05	7.379	<0.05
	Final test	311.5	24.72	7.81	7.93						
Control	Initial test	264	29.135	9.213	11.036	2.143	>0.05	3.144	<0.05	7.379	<0.05
	Final test	274	28.48	9.01	10.39						

- the mean values show an increase of 39.5 degrees in the experimental group and only 10 degrees in the control group, significant only for the first group, also evidenced by the Meaning tests:

Experimental group: $t(9)=6.353 > 2.262$

Control group: $t(9)=2.143 < 2.262$

- the coefficients of variation show very good values, with a slight improvement over the values from initial testings

- the values of t and F at the final testing confirms the significant differences between the two groups:

$t(18)=3.144 > 2.1009$

$F(1,18)=7.379 > 4.413$

Analytical Graphic Representation - Matorin Test
(shows the differences between the two tests held in October and May)

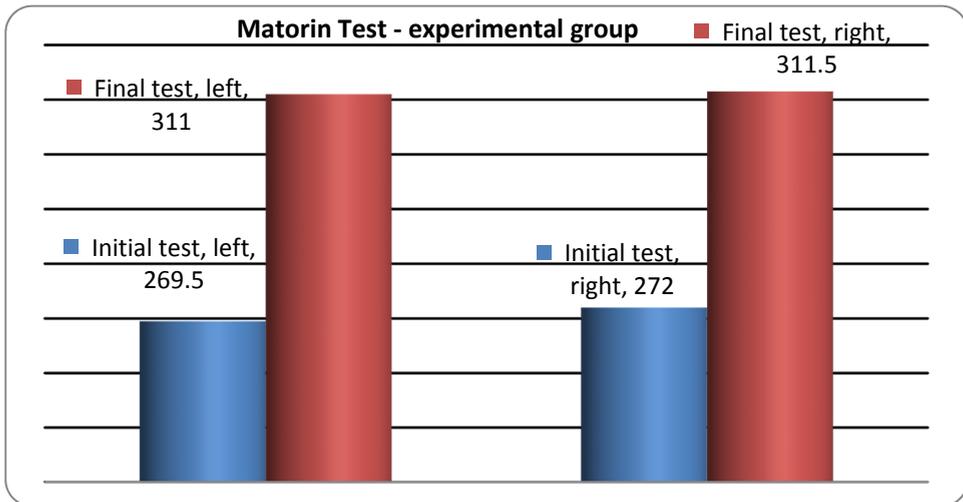


Figure 4. Matorin-group experiment-average values in the two tests

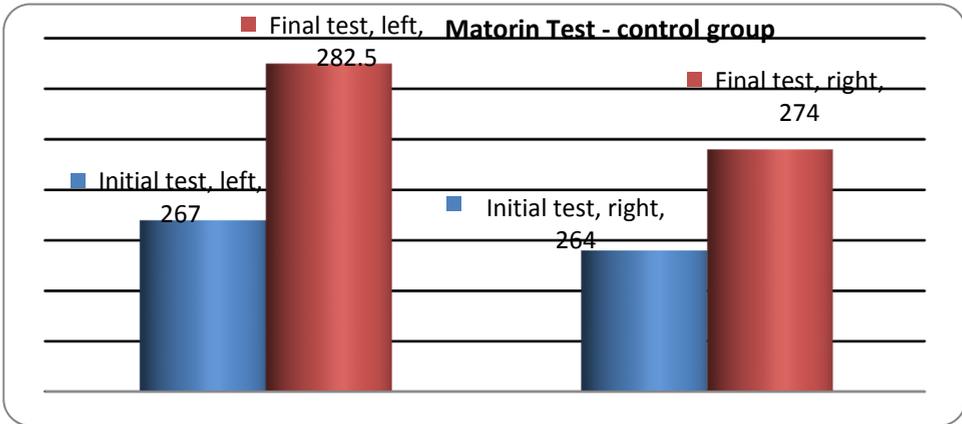


Figure 5. Matorin-control group test-average values for the two test

Table 9. Results of Group Experiment Test-II Test Applicants (Initial Testing)

No.	First name and last name	Test result (seconds)
1.	A.E.	16,4
2.	B.C.	16,8
3.	B.S.	14,4
4.	B.B.	13,8
5.	B.D.	14,9
6.	C.G.	14,1
7.	C.C.	15,3
8.	C.P.	16,2
9.	F.T.	14,3
10.	G.E.	14,6

Table 10. Results of Witness Test Subjects on Test II – Applicable Route (Initial Testing)

No.	First name and last name	Test result (seconds)
1.	M.D.	14,5
2.	M.R.A.	15,3
3.	N.D.	14,8
4.	M.R.	13,9
5.	M.I.	16,5
6.	P.A.	15,7
7.	R.S.	15,8
8.	S.F.	13,8
9.	S.A.	16,1
10.	U.R.	16,3

Table 11. Statistical Tables in Test II (Initial Testing)

Applicative course								
Group	X	S	m	Cv	Student		ANOVA	
					t	P	F	P
Experimental	15.08	3.312	1.047	21.962	0.137	>0.05	1.563	>0.05
Control	15.27	2.86	0.904	18.729				

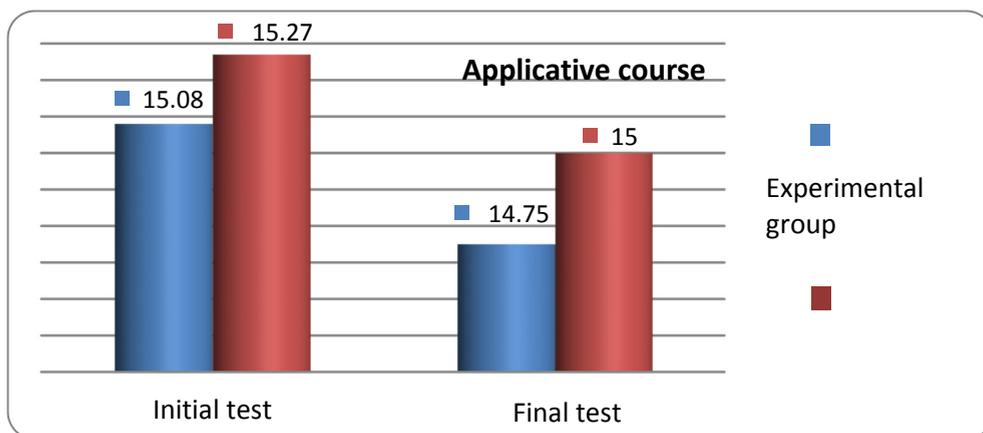


Figure 6. Application course - Average values for the two tests

Table 12. Results of Expert Group on Test II-Application Run (Final Test)

No.	First name and last name	Test result (seconds)
1.	A.E.	16,1
2.	B.C.	16,5
3.	B.S.	14,1
4.	B.B.	13,2
5.	B.D.	14,7
6.	C.G.	13,8
7.	C.C.	15,1
8.	C.P.	15,9
9.	F.T.	13,8
10.	G.E.	14,3

Table 13. Results of Test Group 2 Test Subjects - Applied Course (Final Test)

No.	First name and last name	Test results (seconds)
1.	M.D.	14,2
2.	M.R.A.	15,1
3.	N.D.	14,6
4.	M.R.	13,6
5.	M.I.	16,3
6.	P.A.	15,4
7.	R.S.	15,5
8.	S.F.	13,4
9.	S.A.	16,1
10.	U.R.	15,8

Table 14. Statistical Tables in Test II (Initial-Final Test)

Application course											
Group		X	S	m	Cv	Student initial		Student final		ANOVA	
						t	P	t	P	F	P
Experi- mental	Initial test	15.08	3.312	1.047	21.962	2.816	<0.05	3.231	<0.05	5.258	<0.05
	Final test	14.75	3.675	1.162	24.91						
Control	Initial test	15.27	2.86	0.904	18.729	1.869	>0.05	3.231	<0.05	5.258	<0.05
	Final test	15	3.093	0.978	20.62						

The average values indicate a few seconds improvement of the values recorded between the tests at both groups, significant improvement only for the experimental group:

Experiment group: $t(9)=6.353>2.262$

Control group: $t(9)=2.143<2.262$

- Homogeneity improves in both groups, more significant in the control group.

-The significant differences between the two groups from the final testing are highlighted by the values of t and F:

$T(18)=3.231>2.1009$

$F(1,18)=5.258>4.413$

**Analytical Graphical Representation - Applicative Course
(shows the difference between the two tests held in October and May)**

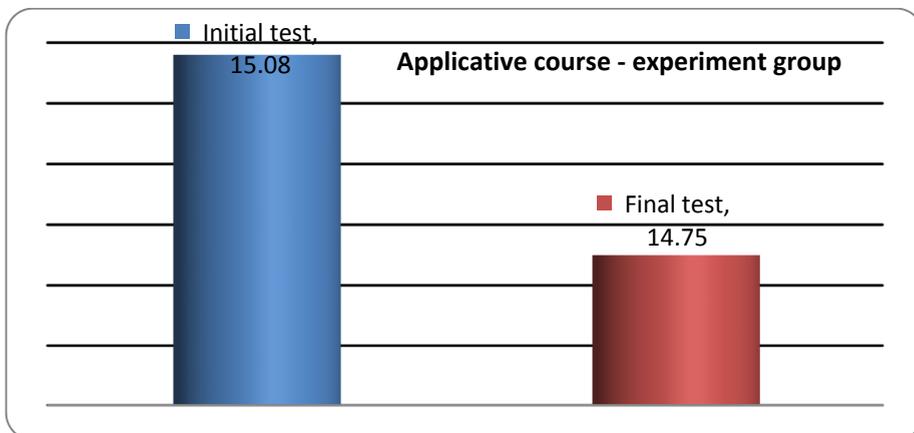


Figure 7. Application-experiment group-average values for the two tests

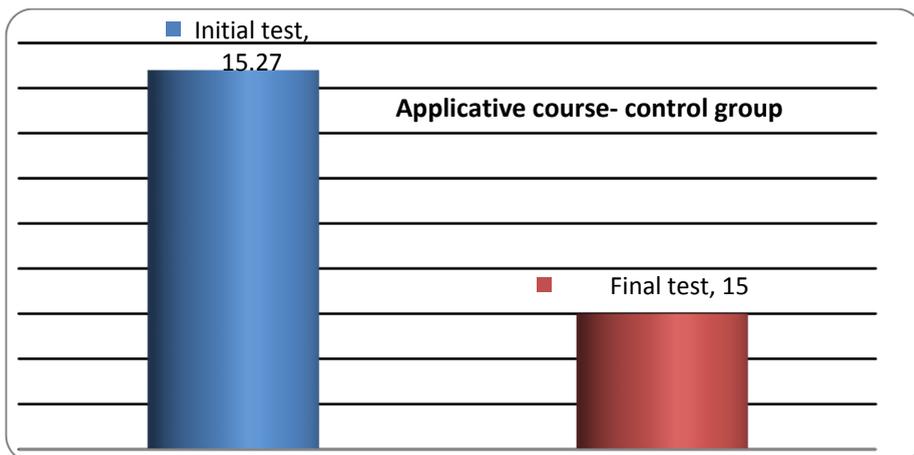


Figure 7. Application run-control group-average values for the two tests

Conclusion and suggestions

Following the elaboration and systematization of the materials presented in this paper, the authors reached out to the next conclusions:

- Starting from the fact that football is a means of physical education, it is considered that within the physical education classes the age-appropriate football exercises can be used to achieve the goals of better motor skills and abilities;

By applying the tests, it was found an increase in general physical development indices.

Due to the morpho-functional particularities of the 10-12 year old students referred to in the present paper, it can be said that our proposal is an appropriate one for the development of motor abilities and especially of the skill.

- The somatic development level determines the necessary time period for the acquisition of the technical procedures that contribute to the development of the skill.

- After viewing the tables and graphs, we can observe an increase in the values obtained by the two test groups between the initial and the final testing.

- The progress of the experimental group compared to the control group is significant, allowing the authors to say that for the optimization of skill, the specific means of football can successfully replace the classic ones.

- By raising the fitness level of the two groups of students included in the proposed experiment, the authors consider that the research objectives have been achieved, the efficiency of the applied methodological system has been demonstrated.

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EFFECTS OF RECREATIONAL TENNIS PRACTICE ON INFORMATION TECHNOLOGY INDUSTRY EMPLOYEES' FITNESS – A PILOT STUDY

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ABSTRACT. Introduction. This pilot research studies the effects of practicing organized recreational tennis on the fitness values emphasized by the Eurofit for Adults test battery. **Objectives.** Our goal was studying the evolution of the physical fitness of Information Technology (IT) workers in Cluj-Napoca, Romania, before and after implementing a recreational tennis program by administering the Eurofit test battery. A secondary objective was testing the measurement instruments we used. **Method.** Firstly, questionnaires were applied in order to find a number of IT workers willing to involve themselves in the pilot study. Further, 24 subjects (n=24) were measured, using the Eurofit for Adults test battery, repeating the measurements after a six week period in which 20 of the subjects participated in organised tennis lessons, while the rest of 4 carried on their daily activities without being involved in extra physical workout programs. Results were then statistically analysed using SPSS software. **Results.** A total number of 55 IT workers (n=55) of which 26 men and 29 women answered the initial questionnaire saying that they exercise once each two days ($M_{men} = 3.58$ days a week and $M_{women} = 3.72$ days a week). Regarding their tennis skill level, most of them declared themselves as novices ($M = 2.14$ out of 10). Regarding the Eurofit test battery results, some improvements were visible in the experimental group after calculating the difference between the initial and final test results means although not all tests showed this. **Conclusions.** These results can stand as a starting point for a more complex research on a larger group of subjects and for a longer time period. Regarding the instruments used, we realised we need to improve their quality, mainly in the case of the hand dynamometers and callipers. Due to some weather condition differences between the measurements days, we plan on replacing the outdoor measurements with the alternative tests offered by the Eurofit manual.

Keywords: *fitness, health, IT, employees, tennis.*

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REZUMAT. Efectele practicării tenisului de câmp recreațional asupra indicilor formei fizice (fitness) a angajaților din industria tehnologiei informației- un studiu pilot. Introducere. Acest studiu pilot cercetează efectele practicării în mod organizat a tenisului de câmp recreațional asupra indicilor fitness-ului propuși de bateria de teste Eurofit pentru Adulți. **Obiective.** Țelul nostru a fost să studiem evoluția fitness-ului fizic al angajaților din domeniul industriei tehnologiei informației din Cluj-Napoca, România, aplicând bateria de teste Eurofit pentru Adulți înaintea și după implementarea unui program de practicare a tenisului de câmp recreațional. Un obiectiv secundar a fost verificarea instrumentelor de testare folosite. **Metode.** În primă fază au fost aplicate chestionare cu scopul de a găsi un număr de angajați din domeniul IT care să dorească să se implice în studiul pilot. În continuare, 24 de subiecți ($n=24$) au fost mășurați folosind bateria de teste Eurofit pentru Adulți, repetând măsurătorile după o perioadă de șase săptămâni în timpul cărora 20 dintre subiecți au participat la lecții de tenis organizate, în timp ce restul de 4 și-au continuat rutina zilnică fără să se implice în activități fizice suplimentare. Rezultatele au fost apoi analizate din punct de vedere statistic folosind software-ul SPSS. **Rezultate.** Un număr total de 55 de angajați din domeniul IT ($n=55$) din care 26 bărbați și 29 femei a răspuns la un chestionar inițial, spunând că ei practică exercițiu fizic o dată la două zile ($M_{\text{bărbați}} = 3.58$ zile pe săptămână și $M_{\text{femei}} = 3.72$ zile pe săptămână). În privința nivelului de măiestrie în tenisul de câmp, majoritatea s-a declarat ca fiind novice ($M=2.14$ din 10). În ceea ce înseamnă rezultatele bateriei de teste Eurofit, unele îmbunătățiri au fost observate în cazul grupului experimental după calcularea diferenței dintre mediile obținute la testarea inițială și la cea finală. Deși nu în cazul tuturor probelor. **Concluzii.** Aceste rezultate pot constitui un punct de plecare pentru alte cercetări mai complexe, efectuate pe grupuri mai mari de subiecți și pe o durată mai lungă de timp. În ceea ce privește instrumentele folosite, am constatat că e nevoie de îmbunătățirea calității acestora, mai ales în cazul dinamometrelor manuale și a caliperelor. Din cauza unor condiții meteorologice diferite între zilele de testare, plănuim să înlocuim măsurătorile efectuate în exterior cu cele alternative oferite de manualul Eurofit.

Cuvinte-cheie: *fitness, sănătate, IT, angajați, tenis de câmp*

Introduction

This research aims to study the effects of practicing organized recreational tennis on the Eurofit test battery fitness indexes of Information Technology (IT) Industry workers in Cluj-Napoca, Romania, as other authors show that productivity, quality of life (Baciu, 2006; Bocu, Lupu, Tache, & Laza, 2001) and a better health (Pescatello & DiPietro, 1993) are linked to a good physical fitness. Our actions try to identify if a partnership between IT companies and physical education

and sports specialists could lead to an improvement of physical and health related fitness and thus also increasing work productivity. Probably, a demonstration of the viability of such a training program could convince companies in Romania and why not, in other countries, to implement similar actions, having health improvement and the increase of physical education and sports specialists jobs as an outcome.

Sustaining the above said, Meerding, Jzelenberg, Koopmanschap, Severens, & Burdorf (2005) emphasizes the correlation between health problems and loss of productivity among employees. (Dutheil, et al., 2013) shows that sports training helped the loss of visceral fat tissue, improved the thickness of the carotid-intima-media thickness and the Framingham score, all being markers for heart illness risks.

Objectives

This pilot study was a starting point in mapping the terrain of research in corporate sports activities in Cluj-Napoca and our main objectives were: implementing the ITennis project, an organised tennis training program, targeting IT workers in Cluj-Napoca and observing the influence of the participation in this project on the Eurofit for adults test battery. Furthermore we wanted to analyze the methodology and means of research in order to improve the procedures we will use in our future studies. Presenting the results to the scientific community as well as to the boards of the participating companies is another of our objectives.

Materials and Methods

In order to select the participants in the study we disseminated Google Docs Forms through the internal newsletter of IT companies in Cluj-Napoca, with their acceptance. We then used the information filled in the questionnaire by 55 IT employees to find out their age, gender, level of physical activity, level of skill in tennis, weekly timetable availability and contact information.

Based on the answers, and mainly on the availability of the subjects, we selected a 24 of them to also participate in the second phase of the project. We then applied the Eurofit test battery twice for each participant at a 6 week interval, during which 20 of the subjects were involved in a recreational tennis practice program consisting in two one hour tennis lessons a week, in groups of four players, assisted by a coach, while the rest of 4 continued their daily activities without being involved in extra physical workout programs. During the measurement, all participants were evaluated in the same order of the test, at the approximately same time of the day, in an airy room and on the outdoor running track (the 2 km walking test). In order to evaluate the subject using the

test battery we needed to use the following instruments, as recommended by the Eurofit manual: weighing, a height measuring device, tape measure, calliper, goniometer, ruler, hand dynamometer, timer and other miscellaneous pieces of equipment (gym bench, duct tape, rubber plates etc.). For the statistical analysis of the data, we used the SPSS software.

Results

The initial questionnaires had a number of 55 respondents (n=55) of which 26 male and 29 female, all of them being employed in the IT industry in Cluj-Napoca, Romania. The average age of the respondents was 28.85 ($M_{\text{men}}=29.69$ years, $M_{\text{women}}=28.1$).

Regarding daily physical activity and tennis skill, the respondents stated that they exercise once each two days ($M_{\text{men}} = 3.58$ days a week and $M_{\text{women}}= 3.72$ days a week) and that their tennis skill level is low ($M=2.14$ out of 10). The Eurofit test battery results show some improvements were visible in the experimental group (EG) (n=20) after calculating the difference between the initial and final test results averages in tests like the vertical jump ($M=1.85$ cm), Body Mass Index (BMI) (0.06 kg/m^2), waist-to-hip ratio (0.07), sit-and-reach test (4.25 cm), single-leg balance (0.6 tries), plate-tapping (1.37 sec), hand grip test (7,97 kg).

At the same time, in the control group (CG) (n=4), progress was smaller: sit-and-reach (0.625 cm), plate tapping (0.46 sec) or inexistent as in the case of the single leg balance test. Regresses being noted in tests like the vertical jump (-1 cm), BMI (-0.15 kg/m^2), waist-to-hip ratio (-0.0125) and hand grip test (-4,175 kg). It is curious though that both groups had an increase of body fat estimate percentage average, and that both groups had an increase of the Fitness Index and $\text{VO}_{2 \text{ max}}$ average.

Table 1. Average difference between performances of EG and CG

Test	Group	N	M	SD	Std. Error Mean
Vertical jump	Experim.	20	1,8500	4,91266	1,09850
	Control	4	-1,0000	1,82574	,91287
BMY	Experim	20	,0630	,43765	,09786
	Control	4	-,1500	,12910	,06455
Body fat estimate	Experim	20	-2,45	2,743	,613
	Control	4	-2,75	1,708	,854
Waist-to-hip ratio	Experim	20	,0070	,01809	,00405
	Control	4	-,0125	,00957	,00479

Test	Group	N	M	SD	Std. Error Mean
Sit and reach	Experim	20	4,2500	3,29872	,73762
	Control	4	,6250	,47871	,23936
Single leg balance	Experim	20	,6000	1,23117	,27530
	Control	4	,0000	,81650	,40825
Plate tapping	Experim	20	1,3720	1,07989	,24147
	Control	4	,4600	,22993	,11496
Hand grip	Experim	20	7,9750	10,20165	2,28116
	Control	4	-4,1750	3,69538	1,84769
Fitness index	Experim	12	4,4225	13,07736	3,77511
	Control	2	6,2716	4,56119	3,22525
VO ₂ max	Experim	12	1,5000	4,63694	1,33857
	Control	2	2,2800	1,51321	1,07000

Discussion

Over the years, several physical fitness evaluation test batteries have been developed. The first to create tests administered to large populations were the North Americans at the middle of the 20th century, followed by the Europeans with the Eurofit test battery in the 1970's. Since then many other means of evaluating physical fitness appeared, however Eurofit became the most used test battery in Europe at the beginning of the 3rd millennium (Jurimae & Volbekiene, 1998).

The test-retest reliability of the eurofit test battery has been studied by Tsigilis, Douda, & Tokmakidis (2002) on a total of 98 undergraduate students in Greece. In the above-mentioned study, all Eurofit motor fitness tests and anthropometric measurements were obtained twice with one week between the two measurements. Intraclass correlation coefficient indicated satisfactory coefficients above .70 for most tests. The only exception was the plate-tapping test, which yielded a low value ($R=.57$). These findings indicated that the Eurofit test battery yielded reliable data for undergraduate students.

As expected, regular physical activity improves fitness indexes, but apparently the quantity, quality and type of movement involved, influences the indexes more or less. Studies (Erikoglu, Guzel, Pense, & Erikoglu Orer, 2015) using the Eurofit test battery for measuring physical fitness have shown statistically significant differences between active soccer players and sedentary counterparts in flamingo balance, throwing health ball, 20 meter shuttle run performance and predicted VO₂ values ($p<.05$) although no significant difference in sit and reach, vertical jump, sit-up for 30s, and touching the discs performances was found.

Conclusions

A look at the recorded results shows a slight improvement of the average performances of the EG participants is visible, in contrast to the CG which only has a few small positive modifications, although the relatively small number of subjects may not accurately represent the physical fitness of all IT workers in Cluj-Napoca.

When referring to the measurement instruments and means we used, we concluded that the hand dynamometers and callipers seemed not to be of the best quality. A solution in this case would be the acquisition of a hydraulic hand dynamometer and a higher quality calliper in order to have results that are more objective in the future measurements. Also, because of the weather differences between measurement days, like exterior temperature and precipitations, we noticed that the 2 km walking test has some limitations and disruptive factors, so in the future we might choose the alternative aerobic endurance test (20 m Shuttle Run Test) offered by the Eurofit manual, as it can easier take place indoors.

This study could be the starting point for larger, longer and better-planned future work. Overall, the ITennis project is a first step towards developing the knowledge of the relatively newly formed research terrain in Romania: the intersection between private corporate institutions like IT companies and Physical Education and Sports Science.

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STUDY REGARDING THE PHYSICAL ACTIVITY PERFORMED BY FIRST AND SECOND YEAR'S STUDENTS ENROLLED AT THE BABEȘ-BOLYAI UNIVERSITY OF CLUJ-NAPOCA

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ABSTRACT. Introduction: Once students enter the higher education system, the preoccupation for performing physical activities decreases when compared with the same preoccupation exhibited while in the pre-university education system. This study took into consideration first and second year university students for which physical education is mandatory, and it investigated the causes of students' lack of interest in physical activity. **Objectives:** The objectives were focused on the involvement of first and second year students enrolled at the Babeș-Bolyai University of Cluj-Napoca in physical activities, organized or not by the academic environment. Another investigated aspect was students' perception on the professional material endowment and the attractiveness of sport and physical education classes. **Materials and methods:** Data acquisition was performed using a Google instrument (online questionnaire) distributed by the online media and filled in by 1,485 students enrolled at the Babeș-Bolyai University of Cluj-Napoca. **Conclusions and recommendations:** Students expressed their willingness to be involved in sport activities, other than physical education classes, organized by BBU, with the condition that those activities would be professionally organized and communicated. As a recommendation for the future, PE teachers should include in their classes short talks about the benefits of practicing physical activity outside the academic schedule.

Keywords: *students, physical activity, Babeș-Bolyai University.*

REZUMAT. Studiu referitor la activitatea fizică desfășurată de studenții din anii întâi și doi ai Universității Babeș-Bolyai din Cluj-Napoca. Introducere: Odată ce studenții intră în sistemul de învățământ superior, preocuparea de a face activitate fizică este mai mică în comparație cu cea efectuată în sistemul preuniversitar. Autorii au decis să realizeze acest studiu aplicat pe studenții din anii I și II pentru care educația fizică este obligatorie și de a identifica cu adevărat cauzele pentru care aceștia nu mai sunt atrași de activitatea fizică, fiind inconștienți de faptul că aceasta „influențează în mod favorabil asupra lor prin întărirea organismului, ascuțindu-le

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mintea și dezvoltându-le deprinderi de socializare”. **Obiectivele cercetării:** Obiectivele s-au axat pe atingerea gradului de implicare a studenților din anii I și II ai Universității Babeș-Bolyai din Cluj-Napoca în activitățile fizice, indiferent dacă sunt organizate de mediul universitar sau nu, al doilea aspect reprezentând percepția studenților asupra dotării materiale profesionale și atractivității orelor de educație fizică și sport. **Materiale și metode:** Pentru colectarea datelor s-a folosit un instrument Google (chestionar online) distribuit prin rețelele de socializare și completat de 1.485 studenți ai Universității Babeș-Bolyai din Cluj-Napoca. **Concluzii și recomandări:** Studenții doresc să se implice în activități sportive universitare, altele decât orele de curs, cu condiția ca acestea să fie organizate și comunicate într-un mod profesionist. Recomandăm ca pe viitor, cadrele didactice să cuprindă într-o oră de educație fizică și elemente motivaționale pentru practicarea activității fizice benevole, aducând la cunoștință, în prezența studenților, beneficiile pe care le oferă acestea.

Cuvinte-cheie: *studenți, activitate fizică, Universitatea Babeș-Bolyai.*

Introduction

Once students enter the higher education system, the preoccupation for performing physical activities decreases when compared with the same preoccupation exhibited while in the pre-university education system. Students are young people who enter the second age category (20-60 years), life's most effervescence period. The quality of their life will depend also on the concretization of these values and on the achievement of "wellbeing" until old age.

In our country, physical education was introduced at the university level at the beginning of the sixth decade, approximately 20 years later after the action done by the great Romanian man, Nicolae Iorga. But the ideas, even if they are big, are not always put into actions. The resistance that this initiative encountered was determined by "the lack of receptivity from the educational forums towards the respective event" (Bănățan, Bîrjega, & Nicu, 1973, p. 20).

This is the reason why, the sport from school is better organized than the one from university even today. It is true, we can see a decrease in the practice of physical activities to a number of teenagers who during school, while being students, they were also involved in sporting competitions, because they were strongly motivated by their parents. As students, they can be less influential from this point of view, taking their own decisions. The young's decision to concentrate on the professional training diminishes the need to do physical activities. Specialists are trying to solve the gap between the two elements by finding a solution to this problem. We can describe educational management as the theory and the practice, the science and the art of projecting, organizing, coordinating, evaluating and regulating of educational activity elements in order

to result in an integrative, harmonious, autonomic, and creative activity of free development of an individual according to the ideal that was established by the education policy (Macra Oșorhean, Zegrean, Petruș, & Ormenișan, 2016, p. 138).

Objectives

The objectives were focused on the involvement of first and second year students enrolled at the Babeș-Bolyai University of Cluj-Napoca in physical activities, organized or not by the academic environment. Another investigated aspect was students' perception on the professional material endowment and the attractiveness of sport and physical education classes.

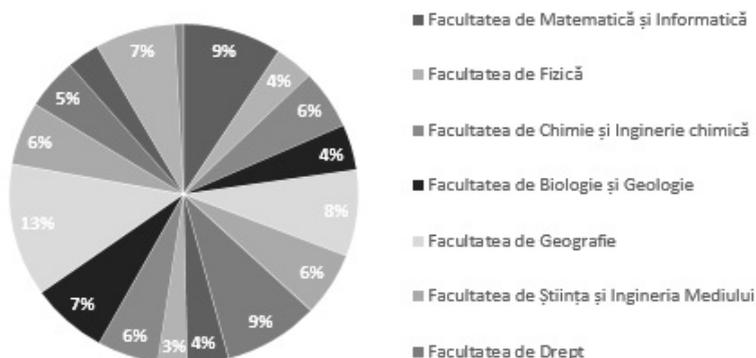
Materials and methods

The opinions of 1,485 students from Babeș-Bolyai University of Cluj-Napoca were collected during the time period 20.10.2016-20.04.2017. From the respondents, a number of 942 girls (63%) and 543 boys (37%) have contributed for the realization of this study.

An online questionnaire with 13 items was filled in by first and second year students. Data analysis was performed with the help of Microsoft Office (Excel) and consisted of graphical representations of students' answers.

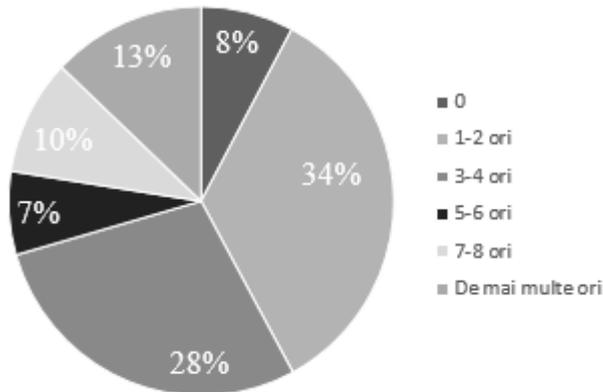
Results

This study was performed on students from different faculties of Babeș-Bolyai University, the higher number of participants being from the Faculty of Economic Sciences and Business Management (188 respondents), the Faculty of Mathematics (136 respondents), and the Law Faculty (132 respondents) (Graph no 1).



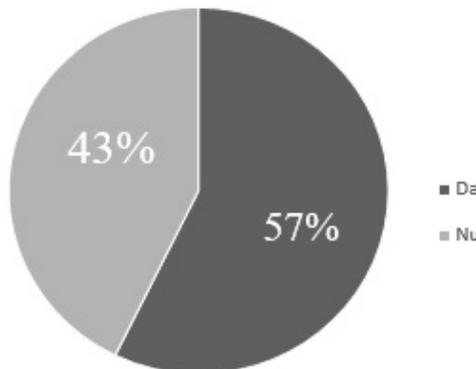
Graph no 1. The faculty where students are studying

Avoiding third year students and the master/doctorate cycle, the research was carried out on first and second year students, the first year students representing 46% and second year students 54%. Among them, 34% answered that they perform physical activity at least once or twice per week, while 8% do not perform any physical activity (Graph no 2).



Graph no 2. Students' weekly physical activity

Over 45% from the respondents did not participate in any physical education or sport classes organized by the University (Graph no 3), and from the ones that participated, over 40% participated to less than 5 physical education classes.

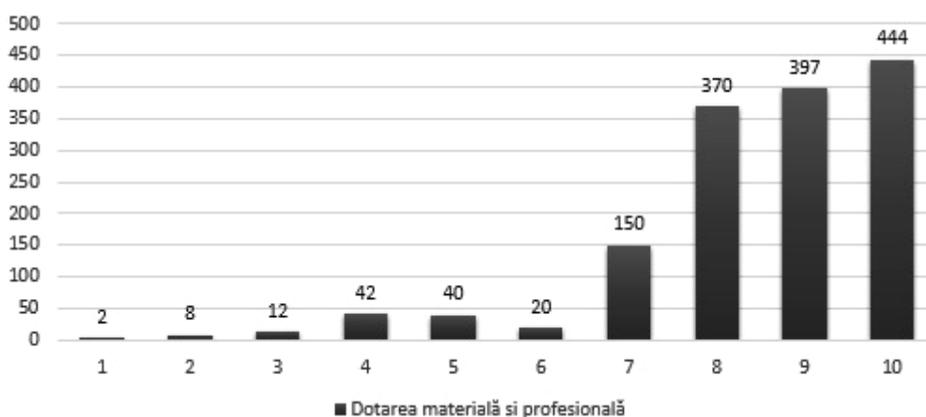


Graph no 3. Participation on the physical training classes

Analysing the data collected for question number 7 (i.e. "This academic year did you actively participate to any physical activity (other than the physical training classes) organized by the University (no matter if they were organized

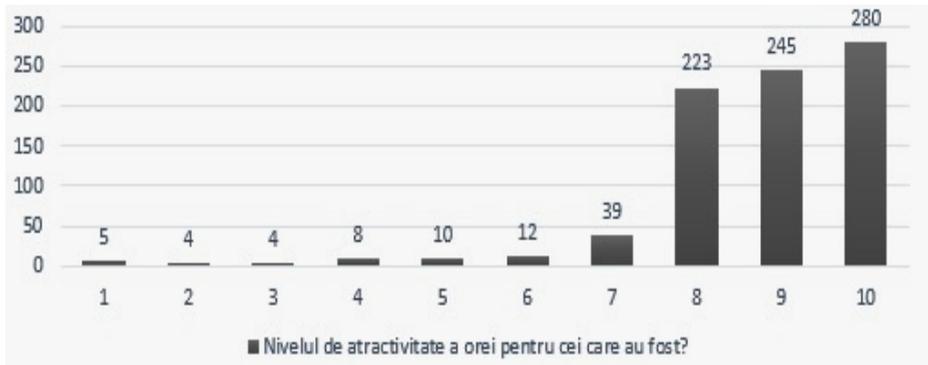
by the University or an association)?”), over 53% responded that they did not participate to any physical activity (other than the physical training classes) organized by the University. The main explanation that students gave was the “lack of information”. 57% confirmed the fact that they did not know when the sports competitions/ physical trainings were being organized. The evaluation of the students’ perception over elements like the professional and material endowment of the University for the activity, the attractiveness of sport and physical training classes or the satisfaction degree towards sport activities organized by the University, shows a positive result with an average of 8,11 on a scale from 1 to 10 for all elements. Therefore, for the professional and material endowment on the sports activities of Babeş-Bolyai University, the students appreciate the teachers’ training, but they also confirm that the lack of space is a problem for the dynamic of the classes, “as there are too many students in a small place”.

Table 1. The grades for the professional and material endowment of the University



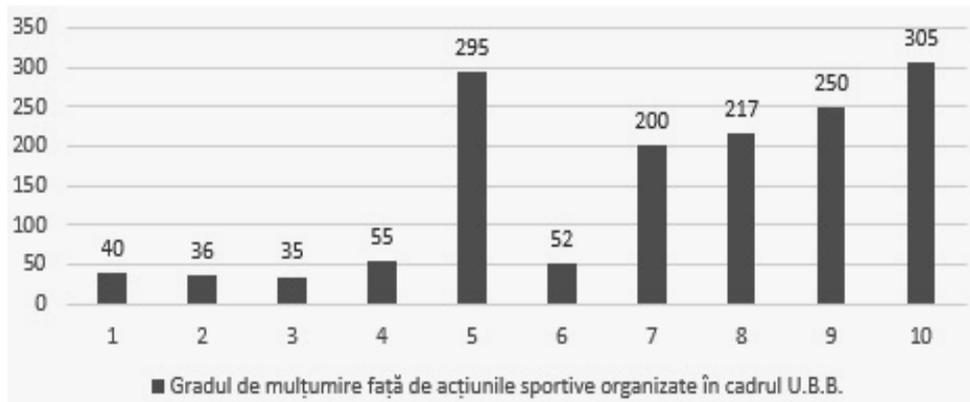
From the attractiveness of sport and physical training classes’ point of view, the respondents say that the schedule is an obstacle to perform physical activities, considering it “unsatisfying”, but they appreciate, at the same time, the wide range of options from where they can choose physical activities they want to perform during classes (volley, basket, fitness). There were taken into consideration only the answers of 830 students that were present at least once at the physical training classes.

Table 2. The attractiveness of sport and physical training classes for students

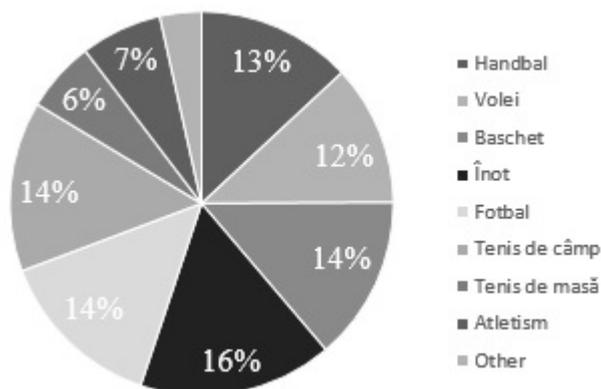


Referring to the satisfaction degree towards the sports actions organized by the Babeş-Bolyai University (BBU) of Cluj-Napoca, students are not entirely satisfied, most of them grading 5 (Table 3) on a scale from 1 to 10 this element, thus pointing out the lack of interest/lack of involvement from University's behalf in these type of actions.

Table 3. The satisfaction degree towards the sports actions in BBU

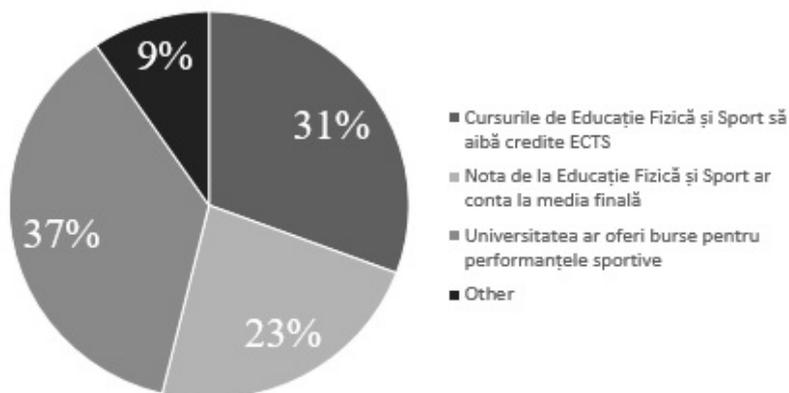


As expectations and desires, the students manifested a real interest in a larger variety of sport disciplines that they could practice during classes, among which swimming (16%) and tennis (14%) were mostly selected, 4% saying that fencing, horse riding and tourist orientation could be among their favourite disciplines (Graph no 4). Being asked what kind of elements would determine a better involvement in the physical and sports activities, the students indicated scholarships for sports performance from the University as a solution.



Graph no 4. Students' favorite sports

Results show that extrinsic motivation is stronger than intrinsic motivation among students, which were not being interested in the benefits of performing voluntary physical activity (Graph no 5).



Graph no 5. Determining factors for the physical activity

Conclusions and recommendations

8% of participants responded that they do not perform any physical activity besides those performed during physical education classes. 92% of respondents were being interested in practicing a sport in their free time. The fact that out of 57% participants at the physical education classes, more than a half participated to only 5 classes, suggest that BBU should be more involved in the process of stimulating students to physically exercise.

The BBU's teachers specialized in physical education (PE) and sport were being appreciated for their dedication during classes. As a suggestion, PE specialists should pay more attention at the students' involvement in physical activities and at their problems. Students expressed their willingness to be involved in sport activities, other than PE classes, organized by BBU, with the condition that those activities would be professionally organized and communicated.

As a recommendation for the future, PE teachers should include in their classes short talks about the benefits of practicing physical activity outside the academic schedule.

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IMPLEMENTING AIKIDO IN PHYSICAL ACTIVITY PROGRAMS WITH 9-10 YEAR-OLD CHILDREN

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ION-PETRE BARBOȘ¹

ABSTRACT. No doubt, in the last years we are witness to maintain supported to make improvements in content and form of the Educational Program from domain of Physical Education and Sports in our country. These searches are concentrate in two great direction: 1. for identifying new instruments resources to increase the attractiveness of lessons and physical education and sports. 2. for improving bio-motor potential in young children. To achieve these two points we developed a project for the children enrolled in the "Brassai Samuel" High School of Cluj-Napoca, in the period 01.10.2013-1.06. 2014, entitled "*Strategies to approach physical training in school children by applying aikido exercises in physical activities in the classroom*". This pilot experiment is part of a research project entitled "Diversifying educational exercise (martial arts) in children of 9-10 years of age to improve health". Groups were formed with 3rd and 4th grades pupils. The children who attended these classes were 9 and 10 years old. The number of participants (N) being enrolled was 40 (boys), tests were applied to 10 children, 5 per each group (experiment and control), with the consent of their parents.

Keywords: *School curriculum programmes, physical activity, aikido, test, indices, correlations, children.*

REZUMAT. *Implementarea Aikido în programul de activități fizice la elevii de 9-10 ani.* Fără îndoială, în ultimii ani asistăm la o încercare susținută de a aduce îmbunătățiri în conținutul și forma Programei de învățământ, în domeniul Educației Fizice și Sportului din țara noastră. Aceste căutări se focusează, atât pentru identificarea unor noi instrumente și mijloace cu care să creștem atractivitatea lecțiilor și a activităților de educație fizică și sport, dar și pentru îmbunătățirea potențialului biomotric al elevilor de vârstă mică. Astfel, am implementat în cadrul Liceului "Brassai Samuel", din Cluj Napoca, în perioada 01.10.2013 – 01.06.2014, proiectul „Strategii de abordare a pregătirii fizice la elevii de vârstă școlară mică prin aplicarea exercițiilor aikido în cadrul activităților fizice la clasă”.

Cuvinte-cheie: *programa școlară. activitate fizică, aikido, test, indice, corelație, tineri*

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Introduction

Every national institution of education tries to offer different "school curriculum" that would attract a larger number of children in activities but at the same time to be a form of training needed for outlining a healthy lifestyle, as well as active from physical activities point of view (National Education Law, art. 1/2011).

Along with widening, the choice of physical activities programs by introducing aerobics exercises, fitness or swimming lessons during physical education classes the content of sports activities was improved, greatly contributing to increasing their attractiveness.

Among other sporting branches that were able to attract the interest of school children there are martial arts, found in many schools from other continents. In Romania, in the recent decades, have been entered in sporting activities supplementary, several branches Oriental arts (judo, karate, aikido) which quickly won the thousands of practitioners, children and adult people as well.

Aikido, as sport activity, promoted by us, means "Martial Art" loved by all sections of society, "from children to adult people as well" for his educational valences, but also for "exotic oriental" with which is surrounded it.

The project motivation

The concept from which we are starting the project is defining ways to make improvements in "educational curriculum" aiming to increase the attractiveness of physical education classes, attracting young children to practice physical activities.

The implementation of practicing aikido in the physical activities program for young children took into account several objectives found in "philosophy of martial arts" being associated with the idea of strenuous physical exercise which, in addition to the effects of technical training, improve our physical condition and bring a better control of weight. Similar research projects can be found in the works started by: Faculty of Human Development, Kobe University (www.h.kobe-u.ac.jp).

The project aimed to start attractive physical activity programs to offset the current trend towards sedentary. A sedentary lifestyle causes among many other harmful consequences, the alarming increase in number of obese children. Current statistics on the prevalence of obesity show worrying figures as the number of overweight people has increased dramatically every year. The lifestyle of parents, disordered eating, and the lack of physical activity in the daily schedule of the children are among the triggers.

This pilot experiment is part of a research project titled "Diversify educational exercise (martial arts) in infants 9-10 years to improve health", and last but not least, the aim of this pilot experiment is that by using exercises contained in "Aikido program for pupils aged 9-10 years old", and correlating effects on motric development potential (speed, agility, strength, stamina, balance) can be determined by measurements these improvements qualitative and also increase the attractiveness of these activities.

Among the benefits of the project pursued by promoting our research, we mention:

- controlling sedentary lifestyle, weight gain of young children (overweight and/or obesity);
- attracting a large number of children in those activities;
- strengthening the balance, knowing that at this age these skills are stabilizing, the technical exercises from aikido (falling techniques) contributing to its improvement (Homma, Gaku, 1993).

Materials and Methods

a. Time and place of the research

The project was conducted between 01.10.2013 - 15.06.2014 at "Brassai Samuel" High School, Cluj-Napoca, in the gymnasium.

Materials used: Gym suits, kimonos, mattresses, trellises, gymnastics benches, mirror.

Time table activities: Tuesdays and Thursdays, 4.00-5.30 pm, during "After school" time.

Children: Groups were formed with 3rd and 4th grades pupils. The children who attended these classes were 9 and 10 years old. The number of participants (N) being enrolled was 40 (boys), tests were applied to 10 children, 5 per each group (experiment and control) having the consent of their parents.

b. Project purpose

"Aikido for children" was intended to be a project for children of primary school.

Purpose: Application of physical and technical training programs using physical exercises that are specific to athletics and aikido. This way we intend to contribute to improving motoric potential of children and to increasing the attractiveness of the classes for extracurricular physical activities.

Objectives

1. Improving motric abilities (speed, agility, strength, stamina) using specific athletics and aikido exercises.
2. Improving balance and coordination.

The research hypothesis

The promoted program that includes specific athletics and aikido exercises can produce beneficial effects (measurable, quantifiable) on improving motoric potential in 9-10 years old children.

c. Procedures

Research Methods: The battery of tests

We acted in implementing pilot experiment in two directions, physical activity program conducted with the experimental group subjects and physical activity program conducted with the control group subjects:

Table 1. The program of physical activity

THE EXPERIMENTAL GROUP	CONTROL GROUP
<p style="text-align: center;">LESSON 1</p> <ul style="list-style-type: none"> ▪ Speed running the 20-meter with bottom start and standing start; ▪ Running speed with change of running direction at signal. Distance: 20-30 meters; ▪ Walking on beam or gym bench in a given direction, facing or not the direction of movement; 	<p style="text-align: center;">LESSON 1</p> <ul style="list-style-type: none"> ▪ Exercises running, jumping exercises, exercises throws with the ball ▪ Running speed change of direction running to beep. Distance 10-20 meters; ▪ Long jump from place at the and sound signal, five repetitions linked; ▪ Runs over different little obstacles; ▪ Relay race;
<p style="text-align: center;">LESSON 2</p> <p>Technical exercises aikido:</p> <ul style="list-style-type: none"> ▪ Starting from the edge of the mattress with the grasping the partner, pulling or pushing each other until one of the two 	<p style="text-align: center;">LESSON 2</p> <ul style="list-style-type: none"> ▪ Exercises, crawling, climbing, lifting and transport objects, escalating; ▪ Basic motor skills, walking, running, throwing - grip,

THE EXPERIMENTAL GROUP	CONTROL GROUP
<p>leads the other in the opposite side of the mattress. Number series: 3-10 Number of repetitions: 2-3; Pause duration: 1 to 2.0 minutes;</p> <ul style="list-style-type: none"> ▪ Moving on back. Serial number: 5. Duration: until the end of the mattress ▪ Move on the mat. Audio signal. Stop. ▪ Keeping a combat position. Serial number: 4. Duration: time the timer (1-15 seconds); ▪ Movements on the mat blindfolded. Serial number: 4. Duration: 1-2 minutes. 	<ul style="list-style-type: none"> ▪ Exercises of organization and order, general physical development exercises, application exercises.

Note: The second part of each lesson physical activities were organized dynamic games and applications covering some routes.

The research method

In this project, we used the following research methods: natural experiment, challenged experiment, the longitudinal multivariate, invoked type. Data analysis was carried out with substantially non-parametric tests (*Wilcoxon and Mann-Whitney U test*).

The error threshold is accepted $\alpha = 0.05$, meaning that we accept a 95% probability that the test result is not accidental. Due to less of subjects (5 + 5), interpretation of the results by nonparametric tests encountered some difficulties, but overall have been significant advances at the experimental group.

Within this study we used for the evaluation we used for the assessment and quantification the results achieved by subjects found in the following EUROFIT tests (Eurofit, 1993).

1. Flamingo balance test - the test of balance on one foot left and right.
2. «BEEP» -running 20 meters x n – endurance.
3. TRANSFER- running - 10 x 5 meters - speed.

Results and data analysis

Following of the two examinations, initial and final, we obtained the following results:

Table 2. BALANCE test results - compared to the two groups

GROUPS	Media	The average difference	Median	Standard deviation	Minimum	Maxim	Amplitude	Variation coefficient
Control	22.20	9.00	19	9.52	12	35	23	42.9%
Experiment	31.20		28	7.73	24	40	16	24.8%

MANN-WHITNEY U- Test

Table 3. Rank values

GROUPS	N	Rangs medium	Sum of ranks
Control	5	4.20	21.00
Experiment	5	6.80	34.00
Total	10		

Table 4. Parameter values

Parameter test	Result
Z	-1.358
P (2-tailed)	0.175
Magnitude- effect	0.43

We note that at the test of balance the average of the experiment group is higher than the one of the control group by 9 sec (40.5%), average being 31.20 to experiment, respectively 22.20 to control. The results vary from 12 and 35 at the control group, and from 24 to 40 at the experiment group. The dispersion of data around the average is inhomogeneous at the control group and relatively homogeneous at the experiment group. The value of the index of the effect size (0.43) shows a medium to large difference between the two groups. According to the nonparametric Mann-Whitney U test, there are no significant statistical differences between the two groups, $z = -1.358$, $p = 0.175 > 0.05$. The null hypothesis is accepted. Graphical representation of individual times, averages and their difference for the two groups is shown in Fig. 1.

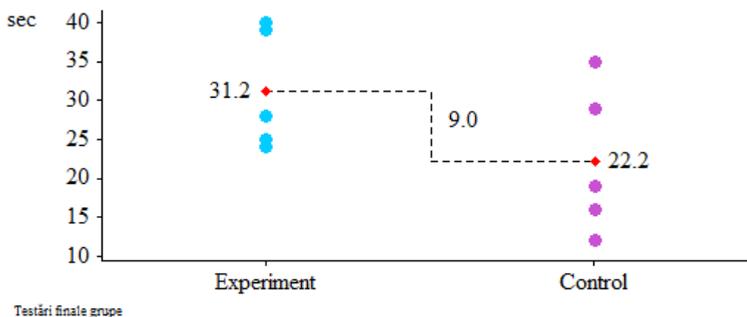


Fig. 1. Test balance

Table 5. Results “BEEP-TEST” - Compared to the two groups

GROUPS	Media	The average difference	Media n	Standard deviation	Minimum	Maxim	Amplitude	Variation coefficient
Control	105	42	120	34.96	67	140	73	33.3%
Experiment	147		128	65.63	67	240	173	44.6%

U Mann-Whitney Test

Table 6. Rank values

GROUPS	N	Rangs media	Sum of ranks
Control	5	4.80	24.00
Experiment	5	6.20	31.00
Total	10		

Table 7. Parameter values

Parameter test	Result
Z	-0.736
P (2-tailed)	0.462
Magnitude- effect	0.23

As we can see at the test "Beep" - Running endurance – the average of experiment group is higher than the one of the control group by 42 seconds (40.0%), the group average being 147 at experiment group, respectively 105 at the control group. Results vary between 67 and 140 at the control group, and between 67 and 240 at the experiment group. At both testing the dispersion data around the average is inhomogeneous, in which case the central tendency of the data is best represented by the median. The index of the effect size (0.23) indicates a low to medium difference between the two groups. Nonparametric Mann-Whitney U test shows that there are no significant statistical differences between the two groups, $z = -0.736$, $p = 0.462 > 0.05$. The null hypothesis is accepted. The graph in Fig. 2 shows the individual times values, averages and their differences for the two groups at final testing.

Running endurance

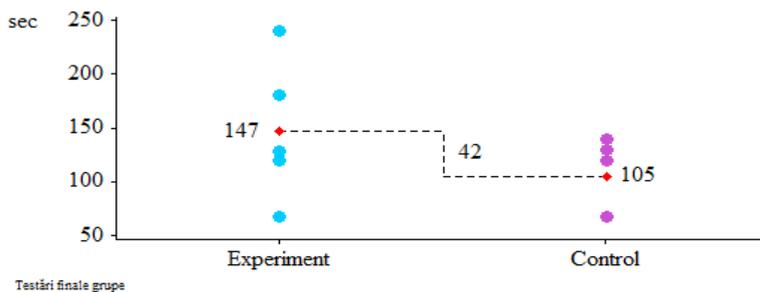


Fig. 2. Running endurance

Table 8. Results TRANSFER comparative test to the two groups

GROUPS	Media	The average difference	Median	Standard deviation	Minimum	Maxim	Amplitude	Variation coefficient
Control	37.60	-10.8	38	6.27	29	46	17	16.7%
Experiment	26.80		28	5.72	18	33	15	21.3%

MANN-WHITNEY U- Test

Table 9. Rank values

GRUPE	N	Rangs media	Sum of ranks
Control	5	7.60	38.00
Experiment	5	3.40	17.00
Total	10		

Table 10. Parameter values

Parameter test	Result
Z	-2.193
P (2-tailed)	0.028
Magnitude- effect	0.69

The average of the experiment group at "Transfer" Test - running 10 x 5 m is lower than the one of the control group with 10.8 sec (28.7%), averages being 26.8 at experiment, respectively 37.6 at control. The results vary between 29 and 46 at the control group and 18 to 33 at experiment. At both testing sessions, the dispersion of data around the average is relatively homogeneous. The index of the effect size (0.69) indicates a very big difference between the two groups. According to the nonparametric „Mann-Whitney U-Test” there are important statistical differences between the two groups, $z = -2.193$, $p = 0.028 < 0.05$. We reject the null hypothesis and accept the research hypothesis. Fig.3 shows individual time, averages and their difference for the two groups at the final testing.

Running 10 x 5 meters

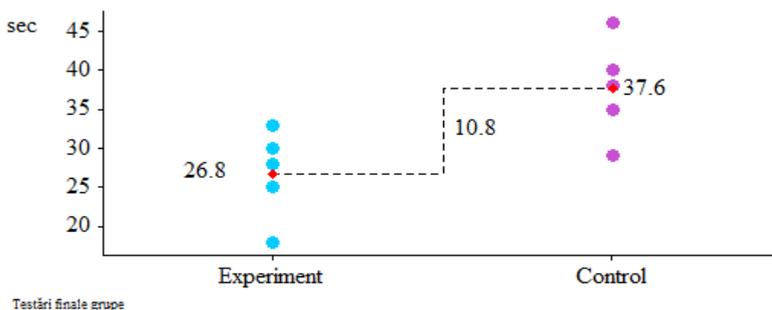


Fig. 3. Running - 10x5metri

Conclusions

Following the results obtained, we detach the need for a strategy to diversify the content of training programs for young age children and the inclusion of technical exercises of aikido can be an option in this regard.

The results achieved have shown progress on multiple directions: speed, strength, balance at the students of the experimental group, although there are significant differences only at speed parameters. Finally we find that the hypothesis of this research was in large validated.

The fact that the program of activities included aikido techniques has provoked in children a positive state of mind during the entire period of research. Children were gladly willing to resume work.

In conclusion this project can be improved considering the aim pursued by widening the choice of exercise programs, including elements and exercises from sports branches agreed by children.

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WAYS OF IMPROVING PHYSICAL QUALITIES IN JUDO BY UCHI KOMI

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ABSTRACT. The Uchi-Komi study is an increasing concern among the researchers. Numerous studies called Uchi-Komi Fitness Test (UFT) have shown a positive role both improve of some motric qualities necessary in judo, as one as related to weight loss, or maintaining it at a constant value (Almansba et al., 2007). Studies are made on the groups of judoka male and female with ages between 20 and 29 years old, differences between the sexes is ± 3 years with various levels of training, from intermediate to advanced.

Keywords: *Uchi-Komi, Respiratory Volume (RV), Butsukari-geiko, Nage-komi, Te-waza, Koshi-waza.*

REZUMAT. Metode de îmbunătățire a calităților fizice în judo prin Uchi-Komi. Studiul Uchi-Komi cunoaște o creștere în rândul cercetătorilor. Numeroase studii care folosesc Uchi-Komi Fitness Test (UFT) pe judoka de sex masculin și feminin, cu vârste cuprinse între 20 și 29 de ani și nivele variate de pregătire, pornind de la nivel intermediar până la un nivel avansat, arată rolul pozitiv în îmbunătățirea unor calități motrice necesare în judo, cât și în reglarea masei corporale (Almansba et al., 2007).

Cuvinte-cheie: *Uchi-Komi, volum respirator (VR), Butsukari-geiko, Nage-komi, Te-waza, Koshi-waza.*

Introduction

Uchi-Komi is a method used in judo in order to repeat a number of techniques over a period of longer or shorter time. Uchi-Komi translates to "repetition". The term was taken from Kendo, japan martial arts, and professor Jigoro Kano (1860-1938) introduced it to the Kodokan-Judo since the early

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years of school. Over time, the method has improved, and it is used today, to improve speed, strength and endurance, with all their variants and to improve the skill in executing a technique. Studies related to this method have been made in many countries of the world, and there are some in Romania. At international level, the best known studies are those of Almansba et al. (2011) and Azevedo et al. (2007).

Uchi-Komi as a form of training, should not become a simple routine designed to fill a gap in judo sport training, but it must follow throughout the execution, a perfect coordination between head - hands - trunk - legs, keeping a distance (ma-ai) enough to allow a good development of action. On the other hand, we cannot go to Uchi-Komi execution as long as the practitioner did not have the basic elements (judo principle) of a technique (gripping - kumi kata, unbalancing–Kuzishi, loading, projection–Nage waza-insurance and self-insurance).

Materials and Methods

Advantages and disadvantages of Uchi-Komi

Besides improving the technique, as a basic factor in Uchi-Komi, it also aims to improve some basic motor skills, decisive for finishing a technique. However, Uchi-Komi cannot fully solve the application of techniques in competition or fight situation, because their execution is static, on the spot and not on the move as is Butsukari geiko, which is much closer to real combat situations.

Another Uchi-Komi disadvantage is the fact that the projection Nage-Komi, which is in fact the end of a technique, is not executed. Long-time practice of only Uchi-Komi could cause imbalances between the components of a technique.

Studies conducted by De Cree and collaborators have shown that initial values of Respiratory Volume (RV) increased during the first six weeks of practice (De Cree et al., 1995), and then remain constant, as a consequence of overcompensation and adaptation (Callister et al., 1991). This gives us an orientation for combining the Uchi-Komi with other methods of improvement existing in judo.

Uchi-Komi requires, besides the knowledge of the technique, a series of qualities such as mobility, ability to stretch the muscle, a quality that in the last years has been lost by many judoka because they were concentrated on many strength exercises that have shortened muscle fibre.

The advantages of the Uchi-Komi are those related to the orientation in space, especially in turns back to Uke (as in arm techniques, as Te-waza, or hip technique, as Koshi-waza).

Other advantage is the increasing of the speed of execution of technique through use of several muscle groups, not only one, or two groups isolated.

The development of general force is an important factor for execution of a technique. Uchi-Komi achieves that objective, because the studies undertaken demonstrate an increase in strength (Léger et al., 1984).

The chemical changes caused by Uchi-Komi practice have been demonstrated by studies conducted by Callister et al., who which recorded elevated lactic acid, 1.1 - 9.1 mmol/ L (Callister et al., 1991).

Uchi-Komi methods

Speed Uchi-Komi

Speed is a very important motor skill for judo practitioner. As speed is an acquired motor skill (Nenciu, 2002), the number of repetitions on period of time can vary from one judoka to another. According to Hantau I. (2005), it is recommended to execute Uchi-Komi for 7 seconds in order to improve the speed of execution of a technique.

Our proposals for speed Uchi-Komi

Number of repetitions: 5-7 seconds

Technique: (Three techniques) - Tai-otoshi, Seoi-Nage, Koshi-guruma,

Number of series: 5-6/ technique

Break time: 3-5 minutes

Endurance Uchi-Komi

Studies have shown that throughout the execution of endurance Uchi-Komi aerobic capacity increases significantly, at both male and female judoka. These values are different from one category to another, and the most significant are those from the higher category.

So, to women, were reported values between 43 and 53 mL / kg, at 1-minute execution, while male judoka obtained higher values, between 44-64 mL/kg, for a period of 1 minute (Aziz, Tan & Teh, 2002).

Applying in combination with Nage Komi (projection art) allows a judoka to improve his speed of execution in the endurance and strength condition. A study conducted by Franchini, Artioli & Brito (2013) showed that the project every three second, for one and a half minutes, on several series, provides an increase in heart rate up to 183b /min. This provides an opportunity to increase the resistance in judo by specific path judo.

The maximum and minimum heart rate (HR max and HR min) showed a high reliability during Uchi-Komi resistance (ICC > 0.90) with a measurement error of < 2%.

Proposals for endurance Uchi-Komi by the circuit, proposed by Lidor et al. (Lidor et al., 2005)

Materials: kimono, rope, gymnastics bank.

Number of stations: 10

Station 1: 4x8m – The two judoka are facing the front at 8 meters.

Station 2: ippon-seoi-nage (the authors' proposal Nage-waza)

Station 3: climbing rope

Station 4: Output of Kesa Gatame

Station 5: jump over a gym bank.

Station 6: o-uchi-gari

Station 7: 25 crunches on back on tatami

Station 8: Output from yoko-shiho-gatame

Station 9: 20 push-ups with arms support on the ground, feet on a bench
gym

Station 10: 8 Projections with your favourite technique.

Our proposals – strength Uchi-Komi

Being in the strength regimen, Tori could choose a heavier partner or two partners to increase the difficulty of their load.

Proposal of force Uchi-Komi

Uke will be a partner with at least 10 kg heavier. Tori will realize Uchi-Komi with detachment of Uke from the tatami (with load).

Number of repetition: 10 / left-right= 20

Technique: Tai-otoshi, Seoi-Nage, Koshi-guruma,

Number of series: 4-5

Pause: 2-3 minutes

Discussions

Besides improving the technique, as a basic factor, Uchi-Komi also aims to improve the basic motor skills, decisive for finishing the technique. However, Uchi-Komi cannot fully solve the application of techniques in competitive or combat

conditions, because their execution is static, on the place and on the move. Butsukari geiko is closer to the real judo competition (shiai).

Another disadvantage of Uchi-Komi is that it does not execute the projection (Nage Komi), which is actually the end of a technique. Practicing only Uchi-Komi for a long time could cause imbalances between components of technique.

Studies conducted by De Cree and collaborator have demonstrated that the initial values of Respiratory Volume (VR) increased during the first six weeks of practice (De Cree, Lewin & Barros, 1995), then remain constant, as a consequence of overcompensation and effort adaptation (Callister et al., 1991). This gives us an orientation for combining Uchi-Komi with other existing methods of training in judo.

Uchi-Komi supposes besides the knowledge of the technique, and a number of qualities such as: mobility, muscle-stretching ability, a quality that in recent years many judoka have lost because of focus training on a large number of strength exercises that made it shorter muscle.

The advantages of Uchi-Komi are those related to spatial orientation, especially in turns back at Uke (as in arms technique, Te-waza or hip technique, Koshi-waza). Increasing the speed of execution of a technique, by using several muscle groups and not just an isolated one.

Practice of Uchi-Komi it can be achieved on a small space, 2 m², which gives the coach the possibility to observe better the technique. The development of general force is an important factor in the execution of technique. Uchi-Komi achieves that objective studies undertaken demonstrate increased strength (Léger et al., 1984).

Chemical changes caused by the practice of Uchi-Komi have been demonstrated by studies conducted by Callister et al., who had elevated lactic acid levels, 1.1 -9.1 mmol/L (Callister et al., 1991). These studies were conducted on subjects aged between 20 and 29 years old; but we do not have data for veteran judoka, who participate in veteran competitions, aged over 30 years. Judoka over 30 years old have different physiologically and psychologically particularities. It is important to know what are the ideal parameters a judoka over the 30 years old can reach without affecting their health status.

Considering all these aspects, we came with a one-year study proposal at the Faculty of Physical Education and Sport for 2017-2018 with veteran judoka from "Universitatea-Cluj". We study the speed at Uchi-Komi, for judoka veterans between 30 to 35 years old. We chose this motric quality, because over 30 years of age the speed decreases (Holyloszy & Coyle, 1984), but we are assuming that continuous training, over 30 years old, can bring major improvements in speed execution of judo techniques.

The 10 judoka who are part of the study, participate at the veteran and Kata competition, and have four judo training per week. The results will be public in two stages.

Conclusion

The Uchi-Komi training for judoka between 20 and 29 years old, offer the opportunity to improve basic motor skill (power, speed, endurance), qualities that can improve at a level close to that of Shiai (competition). The lack of scientific research for veteran judoka, over 30 years old, did not provided us with information about how we should developed training for veterans.

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VARIANTS OF IMPROVEMENT PHYSICAL QUALITIES IN JUDO BY UCHI KOMI

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SUBJECT-BASED EXAMINATION OF THE HUNGARIAN BASKETBALL REPLACEMENT - EDUCATION DUE TO THE SPORT CULTURAL CHANGE OF ATTITUDE

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ABSTRACT. Significant changes characterize the replacement teaching since 2011. The most important was the introduction of TAO program and in parallel, the Public Health and Sport XXI programs also made their effects felt. In addition, the Teaching basketball players united organization professional workshop was born. From inactive kids, more and more get into sports teaching and competitions. As a starting point it is a positive choice, however, some other resources in the sport culture are deficient. At least, from the perspective of personal and objective conditions. There are no equal conditions. There are huge gaps between workshops that provide training, coaches are still not well paid, there is a low number of full time employees or well-prepared coaches, and these are only a few of the reasons why the quality of their life is lower. However, one of the basic conditions of the successful training work is a secure background. During the research we collected data about the opinion of replacement coaches, about the role and status of coaches and the functioning of the sports teacher/pedagogue programmes in our country. Other data focused on the environmental resources (institutions, toolkit) and on human resources (readiness and studies of trainers), on the most important problems of sports educational programme (its goal, content, research-evaluating, sport culture, changes, elements on competition balance, equal chances). We have also examined some of the problems that mostly define the work of trainers and the positive examples that work well in practice besides many problems related to replacement-training, the enhancing and keeping talented people in the system successfully.

Keywords: *theoretical paradigm changes, opinion of basketball coaches, talent mentoring, sports professional program*

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Introduction

The sport supporting system of the Hungarian Corporation tax allowance (TAO) provides opportunity for the involvement of significant resources in case of view-team sports, including basketball. The aim of the support is to have as many amateur basketball players to play under better circumstances as possible. As an effect of the supports, more and more people started to do sports in Hungary, which - in a long run, can lead to basketball to be more successful. By involving market funds, TAO program has brought many professional workshops' financial independence.

The details of the tax allowance are contained in the Government Regulation of July 1, 2011. All profitable, tax-paying Hungarian corporations can provide support. This state measure of billions has a great impact on the educational work of coaches, as in comparison to the previous decades, many other options are available for instructors. That is the reason why the comprehensive study of the actual state of replacement of the sports is justifiable.

The extent of the changes of the past five-six years became an important question. The other practical reason is that the lack of available quality facilities is a question of fact. The coach's preparedness, experience and the examination of the relation between their financial recognition is interesting besides the inherited problems. We wish to make the participation of the school PE teachers in the new national basketball program visible.

Our main aim is to get answers from the trainers working in the replacement basketball. Our goal is to get to know the followings:

- Coaches teaching the sport and the state of basketball teaching in Hungary,
- Subject background of the sport (it's aim, content, survey-analysis, changes of sport culture, elements of the racing balance, equal chances)
- Available material, financial, personal and social resources, values and conditions
- Worries and problems
- Practical training of the optimal basketball teaching

Situation Analysis

According to our knowledge, coaches teaching the sport experienced development in the teaching process in basketball after the introduction of TAO program (e.g. in the supervision of professional workshop and thank to the Teach basketball players unified federal program and to the competition system, etc.)

However, because of other conditions such as facility problems, there are deficiencies. Thanks to the central (national, federal) measures, there is a significant sport cultural connection between the organizational and the school subject sport activity. The importance of teaching basketball significantly increased in the public educational PE, The quality assurance system works as planned with the lead of the sport association (professional, financial) however, it does not have as big of an effect as important it would be. We believe that there are no equal conditions in Hungary, so the relevance of the TAO lies in the fact that the inequality of chances can be reduced by careful instructor - educator work and management.

1. In Hungary, there are great gaps between the clubs and educational institutes participating in replacement in respect of the resources of the sport cultural system in spite of the growing supports, risk the teaching of a quality replacement.

2. Despite of the difficulties, differences and the programs, there are some good practical examples which has positive pedagogical effect which justifies the priority of the the topic of comprehensive replacement teaching. The relevance of our examination is in the usage of the social exploitation and the scientific bases of new approaches owing to our results can be expected.

Because of the development of the content of the Teach basketball players program studying of the results of the examined person will be an important, that is, the examination of the aims and content believed to be important by them during the replacement-teaching.

The expected results can show significant differences and similarities in case of the teaching of boys and girls. Besides the gender and age group properties, the professional qualification, experiences, the place of teaching and the type of the replacement institution can be informative.

The examination of the sport's teaching program could not only bring practical outcome, it can also have long-term advantages. The replacement teaching have to face many 21th century challenges, which have an effect on the growing-up generation as well. It has to be realized in some age groups that the chosen talents burn out, stop active sporting before time and the invested resources will not return and the professionalization of kids will become disproportionate. In spite of the mass-moving activity, the decrease of the effectiveness of talent mentoring and athletic sufficiency is an inherent phenomenon. However, the clear aim of replacement teaching is the sufficiency of active, quality athlete kids.

The goal of the talent-centred replacement teaching is the involvement, choosing, mentoring and keeping of kids. Based on the known national research it can be said that in our time, the premature stop of active, talented kids occurs as a similar problem worldwide. That is why the teaching program of some sport

culture should be rethought as soon as possible. Goals, tasks, requirements, methods and their restructuring. All these refer to a serious problem in such hierarchical systems like replacement in basketball competition. The importance of the research is based on that it tries to forecast these changes. It tries to find solutions and answers to the actual problem.

Theoretical background

The research started from the results of different studies.

The first was created after one year of the introduction of TAO program and it got to the restructuring of the educational arena. *Fighting for sport opportunities: On a new way in talent mentoring and the performance-oriented educating in basketball teaching - Basketball Academy DE, Nagy Á. (2012)* The continue of it was the first-round examination of trainers. *The role of culture-responsible; the role of basketball coaches in reducing the cultural delay of the sport Nagy-Barna (2012.)*. This was followed by a research of a longer historical period that brought attention to the changes of the athletes' value system. *Sport cultural stereotypes of the professionalization in the program of basketball teaching* (Nagy, 2013). The deficiencies were visible the whole time in the structure of the a1 sport's subject structure, in the human and financial conditions, in inequality, curricula, teaching program that significantly influenced the whole process of replacement teaching.

Spackman (1983) states, that the game's game is the solution of problems. The model of the solution of the game helps to identify problems, form a tactical consideration of problems in athletes. Booth (1983) examined the offensive play, so that athletes have to know how to win or how not to lose. Doolittle (1983) and Jackson (1983) researched the method supporting understanding. They monitored pedagogues using the method. It resulted in success and activity in case of students with fewer abilities too.

They were able to involve more kids to the game who enjoyed playing. According to Kirk (1983), understanding a game is much more than knowing facts about it or make the skill to their own. He made a difference between those who could play and the intelligent gameplay. Those, using intelligent gameplay were able to adapt to every situation and can choose their skills that are suitable for the given situation. Then, the athlete lives together with the game, reads it, knows it, the understanding method is not a perspectival method but the acquiring of the game's basic principles and main thoughts.

Our hypothesizes

It is natural that the educational methods show huge differences, which we should know in order to eliminate and reduce the possibility of time loss as soon as possible, as the success of the educational program stands on more feet and success has to be achieved everywhere so a chance remains for development, that is, the talents can come to fruition. That is the reason why we considered the following hypothesizes to be appropriate for the detailed knowledge.

1. Trainers experienced development after the introduction of the TAO program and the in parallel with the sport programs.

a) Those central measures can be identified which in connection to the TAO supports oblige the professional workshops to the purposeful, verifiable teaching work, where the goals are suitable for the age group, that is, they keep rights, duties, methods and tools in a frame, curriculum-likely.

b) According to our hypothesis, basketball trainers feel development in some areas since the introduction of TAO program and the central, unified sports educating program in 2011. However, they draw attention to some significant deficiencies in connection to the sport culture's resources.

c) We also suppose that the central measures have an effect on the whole vertical structure of the basketball teaching from the preparation groups to the university age group. From talent searching to succeeding.

2. The second hypothesis is about the subject level approach of basketball. It refers to such areas like central problems; the primary and main goals of education; quality and depths of the teaching material; period of time; relevance of the method of evaluation.

Hypothesis: The social value, appreciation, importance and role in the state's health care and sport strategy of basketball teaching grew. In this way, its dominance can be recognized in the school sport teaching and the sport preferences of kids. However, the effects of quality assuring control of the organization became less than how important the feedback would be. We also suppose that there are no equal conditions and opportunities of sports teaching. There are serious differences that have some economic, geographical, sport political and historical r

3. According to our hypothesis, there are deficiencies in the recognition and mentoring of talents and in the trainer's readiness and motivation, which endanger the quality of education.

4. Those feel the difficulties the most who work day by day as trainers at the practical surface of educating. PE teachers and trainers. We suppose that despite the deficiencies of institutions and difficulties, there are quantity and exemplary, easy to follow practical places, which is pedagogical effect is positive and helps. Moreover, prove the subject-approach priority of the examined sports in the new central education program. We also use open questions to identify the problems with which expert directly face in schools, clubs and academies. We also researched if there are outstanding good examples in our country. This could be a school program, workshop job or educational method or anything else that can be connected to replacement teaching. Moreover, we can make a difference between the examined trainers based on their ages, gender and studies.

5. We suppose that the opinion of coaches are different depending on where they live and where they work, on what level of workshop work they are participating and how much time and energy they can spend with trainer job.

Method

The research spreads to whole Hungary, including Budapest: one of the representative agglomeration areas, counties, regions. The data will be collected in 2017-2018.

Pattern: we chose a layered pattern, so the pattern can be representative and relevant at the same time, according to the goals of the program.

Method: we used the cross-sectional questionnaire for the asked ones with open and closed ended questions. The questionnaire will expectedly contain six parts, which will connect to goals and hypothesizes accordingly.

Participants: basketball coaches who represent the regions of Hungarian basketball education and a quantity, professional workshop (Basketball schools, preparatory groups, amateur association of school student Olympics, age group clubs, university clubs, replacement mentoring centrums, academies) Based on the size, number, coach arm of the workshops and their special efficiency.

At the beginning of 2017, we estimated the number of coaches to be around 970-1000 persons. The number of persons of the planned pattern is 50-100 persons.

The number of athletes thought by them is 500-1000 persons. At the end, we will choose 10-20 educational institutes from the possible and known list that are eligible for the previously set research criteria. The filling of the questionnaire works after the previous permission of lead coaches and professional leaders in every case.

For the first try, we went the questionnaires electronically and via post as well to the participants of the chosen method. For the preparation of the up-to-date list, we also used the TAO database of the Hungarian Basketball Players National Association.

We are also prepared to have spare associations in case someone rejects the filling of the questionnaire or fills it out invalidly.

Number of the expected questionnaires: (N=50-100)

Analysis: Besides the descriptive, frequent data, we wish to use the Pearson correlation and the Khi square test to determine variables.

If the table would show less than five values, we would like the exact test of Fischer. We hope that the significance p will be less than 0.05.

Expected results

Firstly, we expect to receive a result that refers to the development of basketball replacement teaching after the introduction of TAO program. For example, the state of basketball replacement teaching is higher, there are fewer obstacles in the way of continuous development and many more fits the previous research's criteria, (grew in number, championship participation, success of talents, selection) also, the quality of life, preparation, qualification of trainers got to a higher level, not only their number grew (Profiteer coaches). The opinion of coaches suggests that that the central professional program and the measures helps the quality education and mentoring, the growing of competition-readiness and also the competition balances will be equal. There will be a chance to examine what goals and subject materials trainers prefer in each age group. The frequency, time, rate of trainings will be very informative for the updating and drafting of the subject program. We expect a better picture in connection with which are those environmental conditions that are obligatory in order to reduce the differences between workshops.

Not only on a scientific level but also in the circle of the whole basketball team the opinion spreads that the objective, institutional and personal conditions and resources are still below average for the quality replacement educating. The questionnaire's further quality and quantity analysis could provide more data about the state of the institution, devices and toolkit. In this way, we can have a typical, national picture about the type and state of professional workshops.

The questionnaire contains male and female answers as well. This way we can reveal the differences and the similarities, which can draw attention to profession connected to gender.

However, it is worth mentioning that female coaches are mostly working in lower age groups. Their judgment greatly influences the results; that is why further research is needed. Besides the gender parameters, many other have a significant importance (age, qualification, studies, place of education, and type of workshop).

Significance of the research

The subject approach of the Hungarian basketball replacement not only brings results pleasing the actual interest but will also be useful in the future. The educating program of the sports face many 21th century challenges in some age groups which strongly influence the effective and successful usage of TAO program; the mentoring and success of talents; increasing of competitiveness; optimizing the competition balance; and also the carrier path, life quality and professionalization of trainers and kids.

Thanks to the state concept, the budget and significance of the preferred professional, educational and development program is very serious and the developments and results cannot be viewed indifferently. Soon, it will worth to rethink some element of the basketball sport culture; goals, tasks, contents, methods, resources and the necessary transformations. All these can cause problems in the complicated hierarchical system and in the education of replacement. The base of our research that it tries to foresee these changes, that is the work search solutions constantly.

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MOUNTAIN BIKE ACTIVITY IN NATURAL AREAS: IMPACTS AND IMPLICATIONS (CASE STUDY: THE CODRISOR FORREST PARK)

HOREA ȘTEFĂNESCU^{1*}, DAN MONEA¹

ABSTRACT. An exploratory literature review was conducted into the biophysical and social impacts of mountain biking in Romania and around the world. This review provided the basis for an impact assessment method that could be applied to mountain biking in natural areas. Mountain biking is increasing in popularity in Romania and Bistrița-Năsăud county.

Keywords: *mountain bike, natural areas, implications*

REZUMAT. *Ciclismul montan, impact și implicații asupra zonelor naturale (studiu de caz: pădurea Codrișor).* Se discută tot mai mult despre implicațiile biologice, fizice și sociale induse de MTB, ciclismul montan care tinde să devină unul din mijloacele de bază ale motricității "outdoor". Și pentru că zona de desfășurare a activității specifice este mediul natural, trebuie abordat principalul modul în care traseele MTB afectează echilibrul natural al zonelor de interes. Principalul mod de investigare este axat pe prelevarea probelor de teren, furnizate de tehnica actuală (GPS). Datele obținute trebuie să permită aprecierea justă a impactului pe care amenajarea unui traseu (cu una sau mai multe piste) îl are în contextul afectării mediului natural.

Cuvinte-cheie: *ciclism montan, arii naturale, impact, implicații*

Introduction

A literature review was conducted into the biophysical and social impacts of mountain biking in Romania and around the world. It provides the basis for an impact assessment method that could be applied to mountain biking in natural areas.

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Hypothesis

This report addresses mountain biking as a recreational activity by examining styles of riding and the corresponding demands of riders. It also identifies the major impacts of mountain biking and explores potential management techniques for developing sustainable mountain biking activities in natural areas. A method of assessing mountain biking impacts has been field-tested. The study was conducted in Codrișor Forrest Park a popular recreation in the area of Bistrița. Park rangers have previously identified areas in the Park where mountain bikers have created informal trail networks and technical trail features.

Mountain biking is increasing in popularity in Romania and this is adding to the demand for more space in natural areas for recreational activities (Goedt & Alder, 2001; Faulks, Richtie & Fluker, 2007; Standing Committee on Recreation and Sport, 2006; CALM, 2007). Mountain biking can affect the environment but the extent of the activity is not fully understood (Goedt & Alder, 2001; Chiu & Kriwoken, 2003).

This situation constitutes a problem for natural area managers, as impact information is needed to ensure mountain biking in natural and protected areas is sustainable. This report addresses mountain biking as a recreational activity looking at the styles of riding and the corresponding demands of riders. It also identifies the major impacts of mountain biking and potential management techniques for developing sustainable mountain biking activities.

A rapid assessment tool, using GPS, was developed to quantify the effects of mountain biking in natural areas and tested in Codrișor Park, where mountain bike created informal trails and modifications to existing trail systems is acknowledged as a problem by Park management. This assessment tool can effectively quantify the actual area impacted by the creation of mountain bike specific informal trails and associated trail modifications. It also provides management with informative and interpretive maps of the impacted area.

Objectives of Study

- To understand mountain biking as a recreational activity in terms of style and demand.
- To provide an initial determination main social and biophysical impacts of mountain biking in natural areas.
- To understand current methods for assessing and managing mountain biking in natural areas.

- To develop a trial assessment technique for quantifying the effects of the main biophysical impacts identified.
- To relieve the development of the mountain biking in Bistrița.

Methodology

An exploratory literature review was conducted to explore the styles of mountain bike riding, the attitudes that are typically attributed to each style and the impacts that these styles would have on a natural area. From this, important issues could be examined in order to determine the major effects of mountain biking in natural areas, the main management implications and what management strategies might be employed.

A GPS was used to track a previously identified informal trail network in GPS data was transferred into a GIS and overlaid onto a map of the Codrisor Forrest Park. The data was analysed on the GIS to quantify the impacts of informal trail networks. The methodology allowed the information to be displayed visually on maps.

Key Findings

Four different categories of mountain biking were defined: cross country, downhill, free and dirt jumping. It is recognised that there are similarities and overlap between the categories with some bikers riding in more than one style. The biophysical and social impacts of these rider groups were found to vary and understanding rider demands is paramount to providing appropriate facilities and management strategies.

Social conflict between hikers and mountain bikers is a potentially serious issue that needs to be addressed by natural area managers. Many research projects have focused on social aspects and the management implications and strategies are well understood.

The biophysical impacts of mountain bikers are less well documented and therefore are not so clearly defined.

Future Action

Conduct research into quantifying the impacts of more aggressive riding styles, skidding and breaking, on trails in natural areas. Use the GPS and GIS mapping assessment tool to determine the extent of the mountain bike

impacts in natural and protected areas, by tracking all known mountain bike impacted areas. All impacted sites can be plotted on a Park map to provide an overall baseline condition assessment of the Park that can then be monitored over time. Develop a management strategy and rehabilitation plan to ameliorate the most affected areas. Where mountain biking is a significant recreational activity a plan should be developed that considers closing off some trails for rehabilitation, instigates maintenance on other trails to make them suitable for the designated recreational use and examines alternative locations where facilities accommodating the more impacting activities, technical trail features, can be developed.

Display an impact map and interpretive signage at Park information areas to inform mountain bikers about the consequences of their actions.

Mountain Biking as a Recreational Activity

Mountain biking is a rapidly growing activity in the whole world (Goedt & Alder, 2001; Faulks et al., 2007; Standing Committee on Recreation and Sport, 2006; CALM, 2007), but there is little understanding of the size and scope of the market (Faulks et al., 2007; CALM, 2007).

In 2004, in Europe, 14% of men and 7.1% of women participated in cycling (Faulks et al., 2007). This represents a 15.3% increase from 2001 (Faulks et al., 2007). The survey, however, does not show what proportion of people are riding mountain bikes or riding in off-road situations. In 2006, cycling was reported to be the fourth biggest physical activity in Australia for people over 15 years. Of the 753,843 bikes sold in Australia in 2004, 69.8% were mountain bikes (Bradshaw, 2006). What is interesting to note is that Western Australia has 10% of the national population yet 14% of bicycle sales (Bradshaw, 2006).

At the retail level, one billion dollars is spent on cycling in Australia each year (Bradshaw, 2006). Surveys in the US reveal that since 1998 about 50 million people have participated in mountain bike activities each year (Outdoor Industry Foundation, 2006). In the US, the increase in the popularity of mountain biking has outpaced efforts to understand and therefore manage mountain biking in natural areas.

Mountain biking has many benefits appealing to different markets. It can be a source of fitness, fun, mental activity, technical challenge, recreation and entertainment in the natural environment (Horn, Devlin & Simmons, 1994; Goedt & Alder, 2001; CALM, 2007; IMBA, 2007). Cycling can provide a range of social and economic benefits to regional areas and the wider community by

stimulating tourism and recreational spending (IMBA, 2004; Faulks et al., 2007). The lack of research into cycle tourism may be inhibiting the development and marketing of cycle tourism (Faulks et al., 2007). Research in the US has shown that mountain biking contributes \$133 billion to the US economy; it supports nearly 1.1 million jobs and provides sustainable growth in rural communities (Outdoor Industry Foundation, 2006).

Research for the US Mountain Bike Plan (Bicycle SA, 2001) indicates that mountain bike riding will continue to increase in popularity, particularly in non-organised recreational mountain bike riding. Improvements in technology are making mountain biking in natural areas easier and therefore available to riders of all abilities (O'Donnell & Carroll, 2003). An increase in the number of riders may lead to increased recreational pressures on peri-urban natural areas. In the US, there is a popular belief that all mechanisation should be banned from wilderness areas (Scott, 2003; O'Donnell & Carroll, 2003). The International Mountain Bicycling Association (IMBA) encourage mountain biking in natural areas in the US. They aim to balance the social, recreational and environmental needs of various users so mountain biking can be sustainable.

Mountain Biking Styles: mountain biking activities vary in terms of skills, exercise, motivation and equipment (Goeft & Alder, 2001; CALM, 2007; IMBA, 2007). Mountain biking can be divided into several different categories; cross country, touring, downhill, free riding, dirt jumping (IMBA, 2007). There are crossovers between the categories and riders may participate in more than one type of riding (IMBA, 2007). Bikers prefer to ride in natural settings and on trails with a variety of features such as slopes and curves (Goeft & Alder, 2001). They also found that males, approximately 30 years old, are the most common participants in mountain biking in New Zealand, UK, the US and Germany (Hollenhurst, Schuett & Olson, 1995; Goeft & Alder, 2001).

Impacts of mountain biking in natural areas: the impacts of mountain biking in natural areas can be arranged into four categories: social, biophysical, human safety, and political (Kerr, 2003). In the US, the political impacts are significant, as mountain biking is not permitted in wilderness areas. Therefore, people who wish to ride bikes in these areas often lobby against the creation of new wilderness areas (Kerr, 2003).

Social Impacts: conflict is a major social impact of mountain biking in natural areas (Schuett, 1997; Carothers, Vaske & Donnelly, 2001; Kerr, 2003; CALM, 2007).

Table 1. Distribution of the categories

Cat.	2015	2016	2017
Elite.	30	40	120
Wom.	0	5	35
Juni.	5	12	40
Master.	10	10	9
Chil.	6	16	7
TOTAL	51	81	270

Social conflict – perception and cause

a. Mountain biking causes unacceptable environmental impacts

- Bad trail design
- Heavy trail usage
- Bad riding practices
- Low maintenance of trails
- Erosion caused by other user groups
- Erosion caused by water

b. Mountain bike riders and other visitors are at risk from falls and collisions

- Potential collisions between different user groups
- High speeds
- High technology users and high risk riders
- Rider has a low skill level
- Blind corners and slopes
- Failure of cyclist to alert hikers of their presence

c. Mountain bikers have goals that are incompatible with the perceptions of other users

- Disturbance of wildlife,
- Intrusion into solitude of other users
- Intimidation of 'lower technology' user
- Low standards of etiquette
- Multi use trails for incompatible user groups (Derived from Horn et al., 1994; Moore, 1994; Carothers, 2001; CALM, 2007; IMBA, 2007)

Conflict can be related to the mode of travel, the focus of the trip, user expectations, attitudes and perceptions of the environment and the level of user tolerance (Moore 1994).

It is apparent that conflict is often asymmetrical, being greater on the side of the 'lower technology' user or the most vulnerable user, walkers feel conflict towards cyclists that cyclist do not reciprocate (Moore, 1994; Horn et al., 1994; Beneficial Designs, 1999; Carothers et al., 2001).

As mountain biking is often perceived as the 'new user', more traditional users may be less tolerant of it (Schuett, 1997; Mosedale, 2003). Similarly, mountain bikers were found to be content to share trails with anyone except motorised vehicles (Goeft & Alder, 2001). This is consistent with the theory that conflict is often perception based, with people being scared of being hit by a bike (Horn et al., 1994; Kelley, 1998).

Single or multi use trails?- The presence of mountain bikes on multi use trails can be a major source of social conflict (Schuett, 1997; Carothers et al., 2001; Kerr, 2003; CALM, 2007). Many mountain bikers are content to ride on rail trails, wide trails with relatively smooth surfaces (Goeft & Alder, 2001; IMBA, 2007), which are commonly designated multi use trails. Furthermore, multi-use trails have many advantages to the natural area manager as there is less of a trail network to maintain and more visitors can be directed on to one trail. This potentially reduces the number of trails required and hence the amount of land affected. However, some more adventurous mountain bikers may prefer the challenges and solitude provided by single track (Goeft & Alder, 2001; IMBA, 2007; CALM, 2007).

Single track does not necessarily mean single use but the nature of the trail and the rider style may make it incompatible with non-mountain bike users (CALM, 2007). These trails often cover rough terrain and include natural technical trail features (TTFs), drop offs and jumps. Accommodating hikers and bikers on a single track.

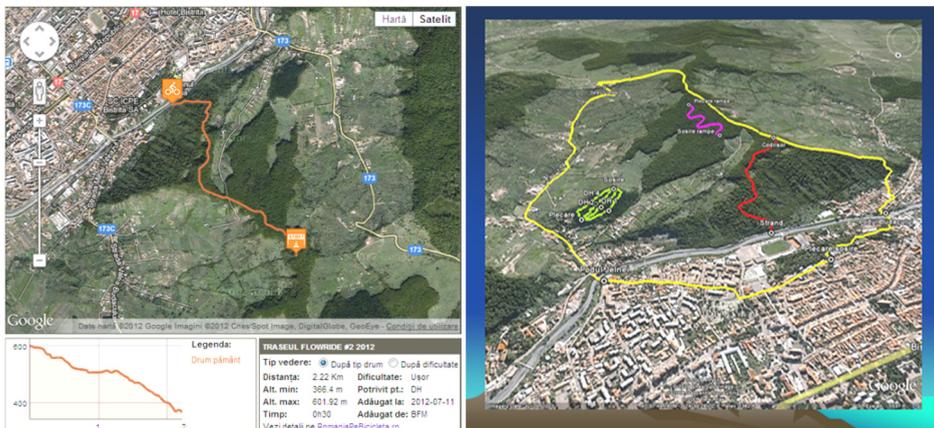
Human Safety Impacts: many natural area users are concerned about the possibility of collisions with fast moving mountain bikes suddenly appearing along trails where visibility is low (Horn et al., 1994; Kerr, 2003). Another risk of mountain biking is the potential of injury from falls when tackling more technical trails or TTFs. Informal trails and TTFs that are not built to an acceptable standard can be a danger to the unsuspecting rider (CALM, 2007). There are many examples of lawsuits in the US where riders who have suffered injuries on trails have attempted to prove that the natural area management was at fault (IMBA, 2007).

Biophysical Impacts: the biophysical impacts of mountain biking in natural areas have not been clearly understood until very recently (see Newsome and Davies in press). Comprehensive reviews of the literature by Sprung (2004) and Marion and Wimpey (2007) concluded that mountain biking is no more damaging than hiking, although at the same time, it is agreed that bikers, and hikers, would cause some environmental damage from their presence in natural areas.

Such impacts can be general trail erosion, reduction in water quality, disruption of wildlife and changes to vegetation. Hikers and bikers have similar impacts on vegetation, preventing vegetation growth close to the trail centreline (Thurston, Reader, 2001). By comparison, horses, cause more damage than bikers do, as they dislodge more material and use wider trails (Wilson & Seney, 1994).

Nonetheless, in natural areas, it can be difficult to attribute erosion to a particular user group. Use levels are often unknown and vary between user groups. Bikers also ride in a variety of styles, each style having different impacts. An inexperienced cross-country rider on a wide, clear multi use path is likely to have less impact than a more aggressive rider cutting off trail through native vegetation. The impacts of informal trails and the creation of TTFs along paths have been identified as problematic but have rarely been documented (Marion, Wimpey, 2007).

Experiment: Bistrița Codrișor Bike Park Evolution



MOUNTAIN BIKE ACTIVITY IN NATURAL AREAS: IMPACTS AND IMPLICATIONS

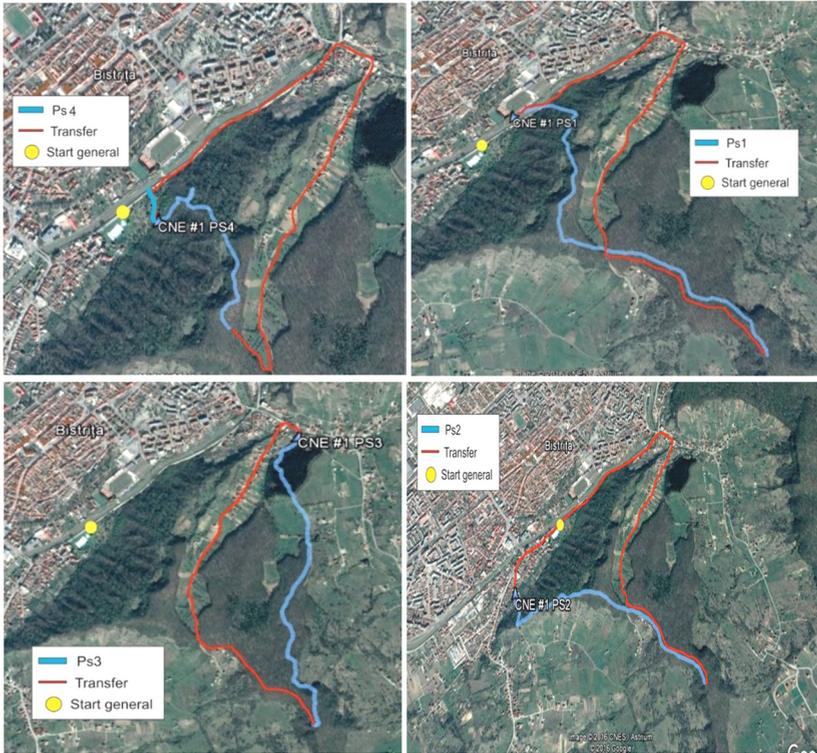


Fig. 1. Bike track evolution between 2010-2017



Fig. 2. 2017 Enduro Cup, national contest, map of the racetrack

Conclusions and suggestions

The tracks had all been created from natural materials found close by in the forest, such as fallen trees, rocks and dirt and blended into the environment. The GPS assessment method can provide an accurate and informative assessment of the impact of mountain bikers in Codrisor Park and similar areas. The method can quantify the impact on a natural area by calculating the amount of land cleared. This information can then be displayed on an informative map. This process should be repeated to assess each informal trail identified by trail inventory or from ranger knowledge.

The total area impacted can then be calculated by summing the individual areas from each assessment. This will give a total area impacted for the natural area. Each assessment can be displayed on a map of the natural area to give visual representation of the impact.

This study explored the research on mountain biking and its impacts on natural areas. Past research has indicated that the relative impacts of bikers and hikers in natural areas are similar. However, previous research has used controlled passes of hikers and bikers along with general trail assessment methods to determine mountain biking impacts. Furthermore, previous research has not adequately catalogued the impacts of mountain biking in natural areas.

A recurring theme in these observations is the perceived degradation of the Park by the user and their response to that. Many of the fire management tracks are severely degraded. There are large water channels running along the tracks and the surface is unstable in many areas. If Parks are to be managed in a sustainable manner and want to support recreation then they need to be given the resources to do so.

Park management needs to demonstrate to the users that it is doing all it can to maintain the Park, such as to rehabilitate degraded areas and badly eroded or unused fire management tracks. Effort is also required to educate users about environmental issues and management strategies. Without these measures, users may continue to be unaware of the damage they are causing and will have no incentive to change their behaviour.

Recommendations

Use the GPS mapping assessment tool to determine the extent of the mountain bike impacts in protected areas by tracking all known mountain bike impact areas. All impact sites can be quantified and plotted on a Park map to provide an overall impact assessment of the activity.

Develop a management strategy and rehabilitation plan to ameliorate the most affected areas. This plan should consider closing off some trails for rehabilitation, maintenance of other trails to make them suitable for the designated recreational use and consideration of alternative locations where facilities accommodating more impacting activities, such as technical trail features on designated mountain bike trails, can be developed.

Display an impact map and an interpretive notice at Park information areas to inform mountain bikers about facilities, trail use and the consequences of their actions in non-designated areas.

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STRATEGIES FOR INCREASING THE PHYSICAL FITNESS OF EMPLOYEES IN THE WORKPLACE

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ABSTRACT. Introduction. Industrialization and the development of modern societies led to an evolution of the motor behaviour of humans. Physical tasks at the workplace got easier, tools that are more modern were invented, and in some cases, it was totally taken by machinery and robots. Unfortunately, deskwork being a sedentary activity, health related issues started to concern our society. **Methods.** The short review of the specialized literature has been done by abstracting data from the eligible articles resulted after searching for the related keywords in scientific databases. **Results.** Authors offer many reasons why strategies for increasing the physical fitness of employees should be implemented at the workplaces and give examples of successful interventions like: involving employees in health related contests, offering free or partially subsidized access to sports facilities and clubs, implementing exercises into the working day or awarding the participation in companies' health programs with incentives. **Conclusion.** The lack of physical exercise affect the health status of the sedentary employees and thus his productivity and cause other derived economic, social and psychological issues. In the current context, promoting physical activity strategies at the workplace is a must. These actions are beneficial for not only the employees and employers but also for physical education and sports specialists as such actions will eventually also increase the number of jobs for them.

Keywords: *physical fitness, workplace, strategies, sedentary, employees*

REZUMAT. Strategii instituționale de creștere a nivelului formei fizice angajaților. Introducere. Industrializarea și dezvoltarea societății moderne au condus la o modificare a comportamentului motric uman. Sarcinile fizice la locul de muncă au devenit din ce în ce mai mici și mai puține, pe măsură ce uneltele moderne au fost inventate, iar în unele cazuri sarcina a fost preluată în totalitate de mașini și roboți. Din păcate, munca de birou fiind o activitate sedentară, problemele de sănătate cauzate de aceasta au început să ne preocupe ca societate. **Metode.** Această scurtă trecere în revistă a literaturii de specialitate a fost făcută rezumând informația provenită din articole de cercetare eligibile, rezultate din căutarea cuvintelor cheie în bazele de date științifice. **Rezultate.** Autorii

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cercetărilor oferă în studiile lor multiple motive pentru care firmele ar trebui să implementeze strategii de creștere a fitnessului angajaților și dau exemple de intervenții cu succes precum: implicarea angajaților în concursuri cu tematică relaționată cu sănătatea, oferirea de acces gratuit sau subvenționat la cluburi sportive, implementarea exercițiilor fizice în programul zilnic de muncă sau recompensarea participării la programele de sănătate ale firmelor. **Concluzie.** Lipsa exercițiului fizic afectează sănătatea angajaților sedentari și astfel productivitatea lor și cauzează, de asemenea, alte probleme de natură economică, socială și psihologică. În contextul actual, promovarea strategiilor de implementare a exercițiului fizic la locul de muncă este necesară. Aceste acțiuni sunt benefice nu numai pentru angajați și angajatori, ci și specialiștilor în educație fizică și sport întrucât astfel de acțiuni vor crește în final și numărul de locuri de muncă pentru aceștia.

Cuvinte-cheie: *fitness fizic, loc de muncă, strategii, angajați, sedentari*

Introduction

Physical work is nowadays becoming almost extinct in modern societies as it is replaced by the work of robots, making it easier for people to make a living. Unfortunately, desk work is mainly a sedentary activity, employees being bound to sit several hours at the office, sometimes in front of a monitor, therefore resulting in health related issues like: stress, anxiety, exhaustion, inefficient sleeping, depression, foggy vision, headaches, neck and shoulder pain, migraines, high blood pressure, cardiovascular illness, loss of flexibility, weight gaining, muscular mass loss, metabolic syndrome, diabetes and others (Computerworld, 2008). According to the above mentions specialized website, Computerworld (2008), office work wears out the human body and causes health alterations. Considering the above-mentioned, physical education and sports specialists should be interested in intervening and improving the physical and health related fitness of this category.

Method

The short review of the specialized literature has been done by abstracting data from the eligible articles resulted after searching for the related keywords (physical fitness, workplace, strategies, employees, sedentary, health related fitness) in scientific databases.

Literature summary

Reviewing the scientific literature results in the summary found below. Firstly, we must acknowledge that the main reasons people practice physical exercise are the need of movement, the need of an optimum health and the need of fulfilment and satisfaction (Tudor, Grigore & Tudor, 2014). The above mentioned authors also conclude that practicing physical activities in groups of people satisfies a large panel of needs which are closely tied to the multilateral development of personality and to the improvement of physical aptitudes, also having a direct effect on the increase of the quality of life.

Rodahl (1989) says that the human body is designed for physical work. The muscular body mass of humans is the equivalent of more than half of the body weight and is designed to energize the body and to perform muscular work. The human physiologic functions imply dynamic rhythmic activity alternated with periods of relaxation. Bergqvist (1995) states that taking the individual away from the repeated cycles of rhythmic contraction and relaxation may predispose the individual to pain, disability conditions, absenteeism, reduced performance in the workplace or to other unwanted outcomes. Even when work conditions and the ergonomic needs are improved, static tension and reduced mobility remain as major predictors of muscular and bone issues, pain, sick leave and other effects of a negative health status. Physical fitness can be defined as the ability to perform physical work at a satisfying level (Council of Europe, 1995). It also often refers to high performance in sports, context in which the fitness is oriented towards a specific task in order to maximize the main components needed in a specific sport.

More generally, physical fitness refers to the necessary mechanical work in an individual's occupation, daily activities and leisure activities. For most individuals in developed countries muscle effort is generally unnecessary at work and daily activities. In this context, fitness refers to an adequate general functionality that can withstand the physical challenges without constraints. It has been found that although physical requirements at work are decreasing, the work capacity of employees decreases to a critical level if there are no physical activities in leisure time that increase fitness. The topic of this research is further motivated by the more and more accentuated prevalence of overweight at the level of the population, 42.4% of Romanian citizens having a Body Mass Index (BMI) that includes them in the overweight category conform Eurostat (2008). MBE Livingstone (2001) studies show that the obesity level in Europe is increasing, mainly in eastern and southeastern countries. This fact is emphasized worldwide by studies like Wang, Monteiro, & Popkin's (2002) that took place in the United States of America, Brazil, Russia and China.

Other recent studies (Tudor & Tudor, 2013) stress that a sedentary lifestyle causes obesity, a bad body posture, low muscle tone, a body mass index and an increased fatty tissue, spine deformities, lack of mobility and flexibility, muscle atrophy, cardiovascular problems, anxiety, etc.

Physical inactivity, among other factors like smoking or an unbalanced diet are elements constantly present in today's lifestyle, rapidly increasing the number of individuals suffering from diabetes, cardiovascular illness or obesity (Bocu, Lupu, Tache & Laza, 2001).

Excess weight is the most prevalent risk factor for cardiovascular disease and one of the factors that improves the least over time in the case of those diagnosed with heart disease. In the recent past, several studies have shown that obesity can cause cardiovascular disease through various mechanisms (Lopez-Jimenez & Cortes-Bergoderi, 2011). However, these conditions can be prevented, the World Health Organisation having recommended 30 minutes of moderate physical activity a day, quitting smoking and a healthy balanced diet.

Reports (Shepell, 2014) offer many reasons why strategies for increasing physical fitness should be implemented at the workplaces. For example costs for employee absence or benefits for cardiovascular disease, cancer and stress can top to 70% of a company's benefit costs. On the contrary, organisations that implemented health improvement programs at the workplace report 11% higher revenue. A summary of workplace fitness strategies includes fully or partially subsidized gym memberships and on-site sports facilities, organised competitions (triathlons, weight loss targets, etc.), workplace walking while on duty and incentives for participating in the company's health programs (free fitness resources, extra time off of work etc.)

Studies had the objective of emphasising some aspects that should be taken into account in order to apply large-scale strategies of promoting physical activity among employees and their families. It is also mentioned that the workplace setting could be useful in promoting the level of exercise through frequent exposures to interventions that influence the employees and indirectly, their families. Furthermore, employers represent a strong stakeholder group that should have an influence on public health policies designed to create physical environment for work at work, as well as within the community (Pronk & Kottke, 2009).

Conclusions

The effects of the lack of physical exercise affect the health status of the sedentary employees and thus his productivity, as (Meerding, Jzelenberg, Koopmanschap, Severens and Burdorf, 2005) also suggest and also cause other derived economical, social and psychological issues. In the current context

promoting physical activity strategies at the workplace is a must. These actions are beneficial not only for the employees and employers but also for physical education and sports specialists as such actions will eventually also increase the number of jobs for them.

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