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(RECOMMENDED CITATION)

THE OBSERVATION, THE HANDLING AND THE CONTROL OF THE SELECTED VARIABLES APPLIED TO THE PILOT STUDIES' SUBJECTS

AURICA DOINA CUCEU[1], MARINICA DOREL CUCEU[2,*], EMILIA FLORINA GROSU[3]

ABSTRACT. This work is the second part of the thesis, respectively of the pilot research. Preliminary research was structured in three stages, in order to check the value of the handled variables, and the recording of the subjects' responses included in research. *Objectives*: - recording the level of the studied parameters for the initial testings; -designing, selecting and applying of all resources proposed as an independent variable in the experiment; -recording the researched parameters' level for intermediate testing; -processing and explaining the data . *Methods of research*: - in the pilot research we have used the following methods: the bibliographic study of the required material, observation method, experimental method, test method, graphics, statistical method and logical method. *Results*: Following the practice of physical exercise as aerobic gymnastics, during a semester, researches' students who formed samples (experimental and control) were tested at the beginning and after three months of research. The results obtained in control samples for , standing long jump' immediately length, mobility and body mass index were statistically processed, and their analysis shows the evolution of indices obtained by the experimental group versus the control group. *Conclusions*: Analyzing the obtained results during the pilot research, we can say that they confirm the pilot researches' hypotheses. Means and methods used in the pilot study proved to be good so that we could conclude that the research can continue.

Keywords: pilot research, exercise, health, independent variable.

REZUMAT. ***Observarea, manevrarea şi controlul variabilelor selectate şi aplicate subiecţilor în studiul pilot***. Lucrarea de faţă este partea a -II- a a tezei de doctorat, respectiv studiul pilot. Cercetarea preliminară a fost structurată în trei etape, cu scopul de a verifica valoarea variabilelor manevrate şi de a înregistra răspunsurile subiecţilor cuprinşi în studiu. *Obiective*: - înregistrarea nivelului parametrilor investigaţi la testarea iniţială; - conceperea, selectarea şi aplicarea mijloacelor propuse ca variabilă independentă în experiment; - înregistrarea

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nivelului parametrilor investigaţi în testările intermediare; - prelucrarea şi interpretarea datelor obţinute**.** *Metodele cercetării:* - în cercetarea pilot s-au folosit următoarele metode: studiul materialelor bibliografice necesare, metoda observaţiei, metoda experimentală, metoda testelor, reprezentarea grafică, metoda statistică, metoda logică. *Rezultate:* În urma practicării exerciţiilor fizice sub forma gimnasticii aerobice, pe perioadă de un semestru, studentele care au format eşantioanele (experiment şi control) supuse cercetării, au fost testate la începutul cercetării şi după trei luni. Rezultatele obţinute la probele de control lungime de pe loc, mobilitate şi indicele de masă corporală au fost prelucrate statistic, iar analiza lor prezintă evoluţia indicilor obţinuţi de grupa experiment faţă de grupa de control. *Concluzii:* Analizând rezultatele obţinute pe parcursul cercetării pilot, putem spune că ele confirmă ipotezele cercetării pilot. Mijloacele şi metodele folosite în studiul pilot se dovedesc a fi bune astfel încât tragem concluzia finală că cercetarea poate continua.

Cuvinte cheie*:* studiul pilot, exerciţii fizice, sănătate, variabila independentă.

Introduction

Health's problem was, is and always will be studied. Exercises have a fundamental role to maintain a control over it.

The main objective of physical education and sport is to improve and maintain health. The importance of this objective for the human being is clearly shown from health's definition; if you are not physically, mentally and socially healthy you don't have a comfortable balance in life. This comfort is achieved by physical activity.

Given the overwhelming importance of health for humans, we propose to show the role of exercise in improving and maintaining it.

The American doctor Richard Stuart Downie considers that health involves two components:

1) "physical, mental and social;
2) Fitness - fitness optimum with four S;
- Strength (physical force);
- Stamina (force, physical strength);
- Suppleness (physical suppleness);
- Skills (skill, physical ability)."[4]

Physical inactivity is considered the largest worldwide public health problem of the XXI century. Nowadays it is well documented that chronic diseases are based on the lack of exercise and a sedentary lifestyle. This requires some

[4] Downie, R.S. et al (1992) - Health promotion, models and values, Oxford, Oxford Univ. Press

intervention on our part, trying to change the mindset about the importance of youth physical exercises, through argumentation and application of physical education and sports methods for the improvement of health through exercise.

Material and Methods

Preliminary research was structured in three stages, in order to check the value of the handled variables and record subjects' responses in the study.

Phase I

At this stage we studied the available literature, we fixed the objectives, the scope, the assumptions and the researches' methods, and we settled the examined sample:

The purpose of the research:

Verifying all the methods and means that we will use in order to improve health and self-esteem of the subjects in this research.

Researches' hypotheses:

- We assume that applying aerobic body styling programs for the experimental group it improves the body mass index, compared to the control group, who performed regular physical education classes;
- We assume that applying aerobic body styling programs for the experimental group, the results obtained of the motion qualities, expansion and mobility, changes compared to the control group, who performed regular physical education classes;

Research sample:

Subjects included in this research were selected at the beginning of the academic year 2012-2013, among female students in their first of the Faculty of Letters of the North University Center in Baia Mare. Following discussions with the team of students from six majors, we formed the experimental group and control group, based on their choices to participate in aerobics program (experimental group) or normal physical education (control group). The age of female students making up these samples is more than 19 years and each sample is composed of 30 students.

Phase II

This is the stage in which the initial values have been measured and recorded, the stage where it was applied the aerobics styling program and the measuring and recording of the intermediate values.

Initial testing:

In October 2012 we made the measurements and recordings of initial values for samples and tests of the pilot research:

- Standing long jump;
- Mobility from sitting (flexion of the trunk before from the seated position);
- Body mass index;

Applying aerobic body styling programs with exercises taken from aerobics gymnastics was originally developed during the first semester. Thereafter measurements were carried out and recordings of the intermediate tests.

Phase III

It is the stage that provided the statistical processing, analysis and interpretation of data and conclusions drawn from the pilot research.

The statistic processing

The centralized data was processed using SPSS system.

The calculated statistical indicators are: the Mann- Whitney test – to identify the significant differences between the two samples, arithmetic mean and standard deviation.

Results

Results from initial testing of experimental and control groups were analyzed by logical comparison with results from tests of the two intermediate groups.

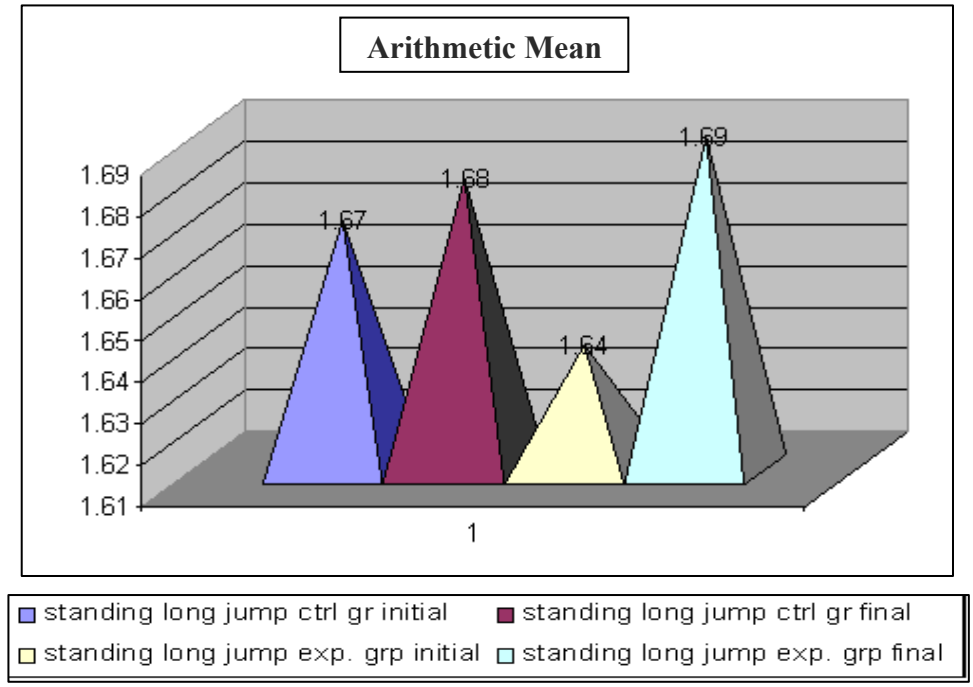
In order to compare increases for the two samples we applied the Mann-Whitney test, used to identify the significant differences between the data used in this research (data from aerobics class versus data from physical education class). By the theoretical interpretation of the U test results, for samples larger than 30 subjects, we used the two cases: Ze <Zc - the case where the null hypothesis is accepted, and Zc > Ze in which case both research hypotheses are accepted. Indicators calculated for the differences in the standing long jump through Mann-Whitney U test are: Ze=2.05 and Zc=1.80, as a result the research hypotheses are accepted. When analysing the 'mobility' test for the experiment sample Ze = 1.90 while for the control group Zc = 1.68. Both these case and the above, the research hypotheses are accepted. For the B.M.I. (body mass index) results are Ze = 2.51 and Zc=2.26 that confirmed the research hypotheses.

After being processed statistically, in terms of arithmetic mean and standard deviation, the obtained values for the 'standing long jump' are summarized in Table No.1, the ones of the 'SITTING mobility' in Table No. 2 and 'body mass index' values in Table No. 3.

Table 1.

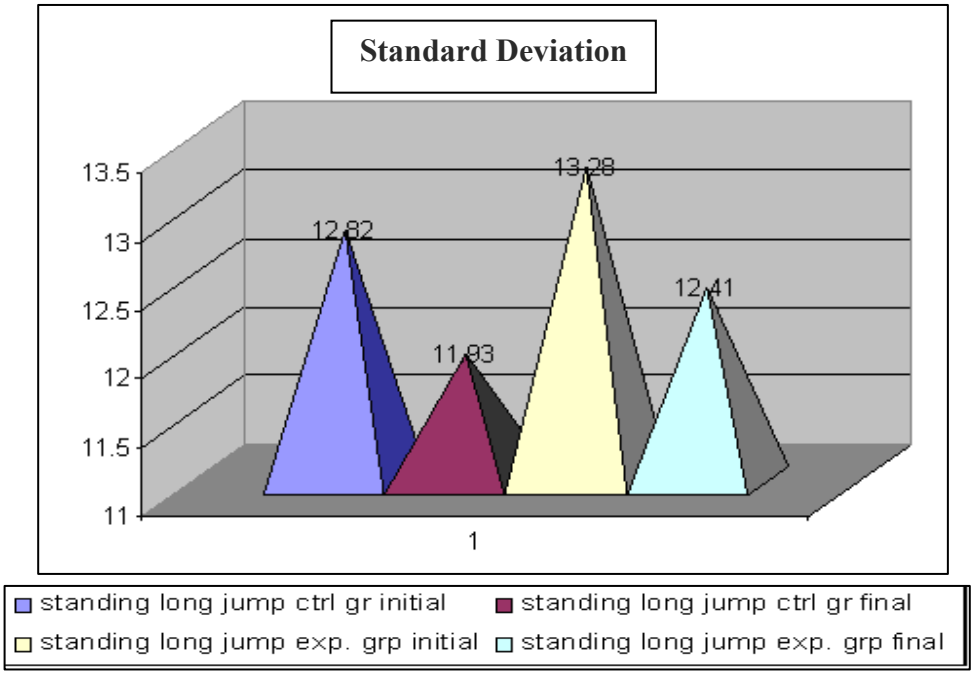
The values of arithmetic mean and standard deviation
for the control sample "standing long jump"

Parameters	Control group		Experiment group	
	Long jump initial test	Long jump intermediate test	Long jump initial test	Long jump intermediate test
Arith. mean	1.67	1.68	1.64	1.69
Std. deviation	±12.82	±11.93	±13.28	±12.41



Graphic 1. Arithmetic means' values for 'standing long jump'

Table No. 1 and Chart No. 1 present the arithmetic means' evolution for the 'standing long jump', from initial testing on intermediate testing. In the control group it increased from 1.67 m to 1.68 m. In the experimental group increased from 1.64 m to 1.69 m. It appears that this parameters' arithmetic mean value of the experimental group improves at the intermediate testing compared to initial testing, with 0.05 m and 0.01 m in control group.



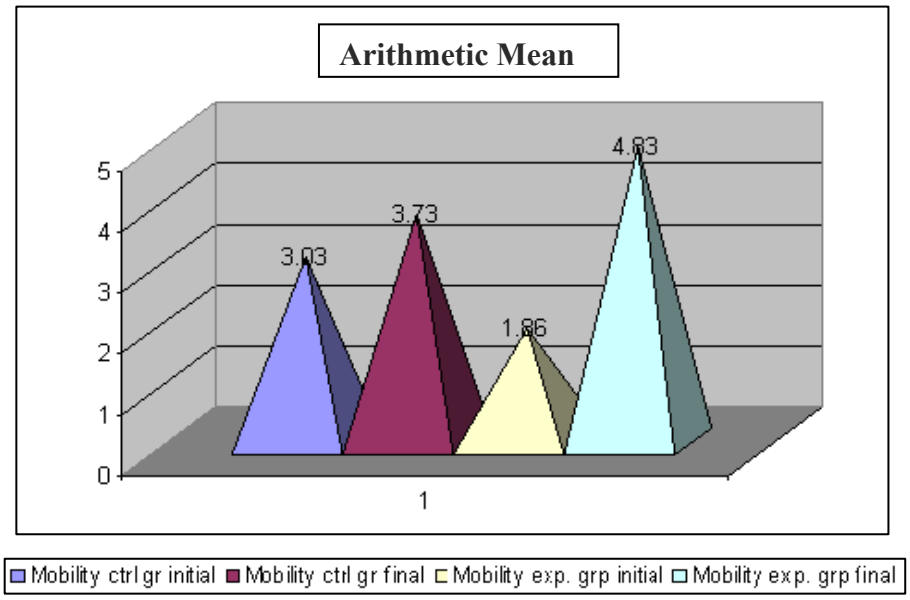
Graphic 2. standard deviations' values for 'standing long jump'

Table No. 1 and Chart No. 2 present the evolution for the standard deviation at 'the standing long jump'. In the control group it decreased from 12.82± to ± 11.93, from initial testing to the final one, so as to ± 0.89 points. In the experimental group it decreased from 13.28 ± to ± 12.41, meaning± 0 87 points. Comparing, we observe an increase of homogeneity, both in the experimental group and the control group.

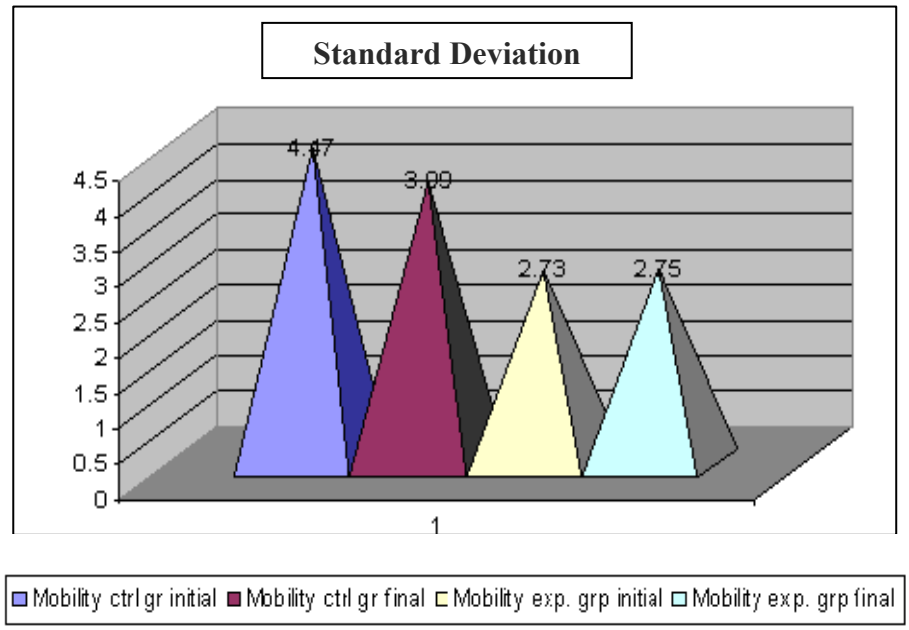
Table 2.

Values of arithmetic mean and standard deviation
of the sample 'coxofemoral joint mobility'

Parameters	Control group		Experiment group	
	Mobility initial test	Mobility intermediate test	Mobility initial test	Mobility intermediate test
Arith. mean	3.03	3.73	1.86	4.83
Std. deviation	±4.47	±3.99	±2.73	±2.75



Graphic 3. Values of arithmetic mean of the sample 'coxofemoral joint mobility'



Graphic 4. Values of standard deviation of the sample 'coxofemoral joint mobility'

Table No. 2 and Chart No. 3 present the arithmetic mean for sitting mobility test. In the control group, the value increases from 3.03 to 3.73, meaning 0.7 cm. Arithmetic mean values, in the experimental group, increased from 1.86 to 4.83, meaning 2.97 cm. Comparing values between control group and experimental one, progress is visible positive in favor of the experiment group, as a result of the effectiveness of aerobic exercises.

Table No. 2 and Chart No. 4 present the standard deviation of sitting mobility test. In the control group, the value decreases from ± 4.47 to ± 3.99, meaning ± 0.48 points, and hence an increase in the homogeneity of the group. Values in the experimental group increased from ± 2.73 to ± 2.75, meaning ± 0.02 points, so hence an insignificant decrease in the homogeneity of the group.

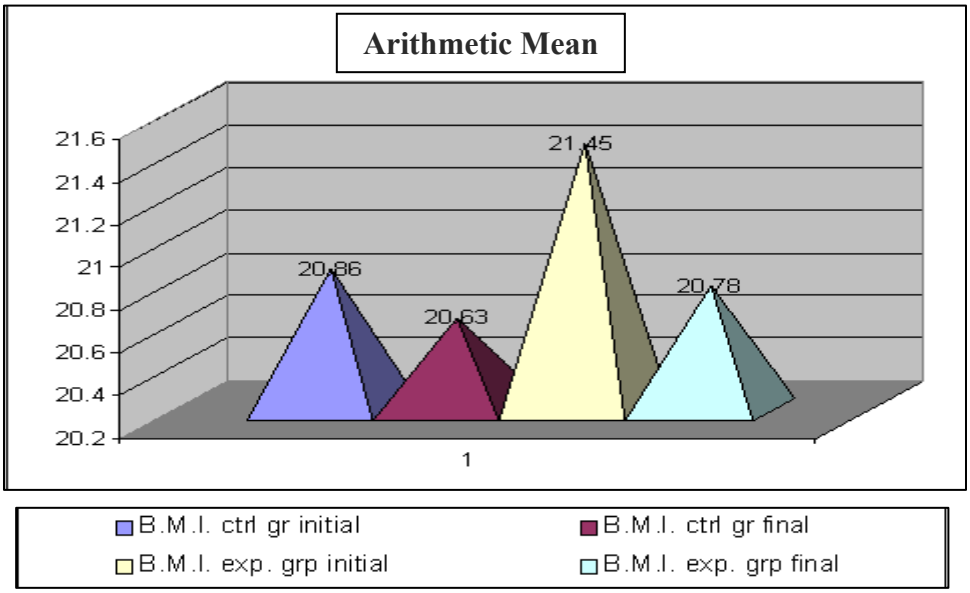
Table 3.

Values of the arithmetic mean and the standard deviation
for the Body Mass Index (B.M.I.)

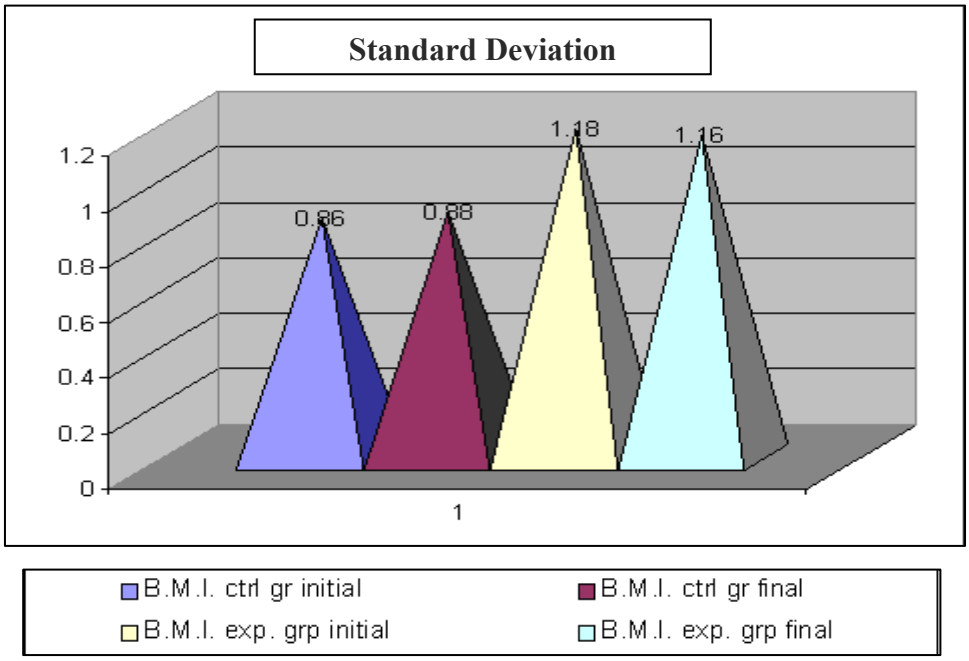
Parameters	Control group		Experiment group	
	B.M.I initial test	**B.M.I intermediate test**	**B.M.I initial test**	**B.M.I intermediate test**
Arith. mean	20.86	20.63	21.45	20.78
Std. deviation	±0.86	±0.88	±1.18	±1.16

Table No. 3 and Chart No. 5 present the evolution of the arithmetic mean for the B.M.I. In the experimental groups, it decreased from 21.45 to 20.78, i.e. 0.67 kg, while in the control group it decreased from 20.86 to 20.63, i.e. 0.23 kg. The result is a superior improvement for the B.M.I. in the experimental group versus the control group.

Table No. 3 and Graphic No. 6 present the evolution of the standard deviation for the B.M.I. In the experimental groups, the values decrease from ± 1.18 to ± 1.16, i.e. ± 0.02 points. We deduce that the homogeneity of the experimental group during the analyzed period increases, as happens in the control group where the standard deviation is ± 0.86 at the beginning and ± 0.88 at after interim tests.



Graphic 5. Values of arithmetic mea for the Body Mass Index



Graphic 6. Values of standard deviation for the Body Mass Index

Conclusions

After the interpretation of the data we can conclude:

- The experimental group progressed more for the 'standing long jump' test, the 'mobility' test; as for the 'B.M.I' there is an increase comparing to the to the control group;
- The aerobics body styling program applied to the experiment group were effective in reaching the goal;
- Students who participated in aerobics classes fared better for the B.M.I. than those who participated in regular physical education class.
- Analyzing the overall results obtained during pilot research, we can say that they confirm pilot research hypotheses.

Means and methods used in the pilot study proved to be good so that we can conclude that research can go on.

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VISUAL CONTROL OF POSTURAL BALANCE OF FIELD TENNIS PLAYERS

COSMIN MIHAI MOCA[1,*]

ABSTRACT. *Background*. Cognitive control processes include a broad class of mental operations including goal or context representation and maintenance, and strategic processes such as attention allocation and stimulus-response mapping. Cognitive control is associated with a wide range of processes and is not restricted to a particular cognitive domain. *Aims*. The aims for this research are the following: 1. The determination of area and length for the trajectory of the weight center's projection using AMTI Netforce platform, 2. Identifying the influence of the visual stimuli over the postural balance; *Methods.* The methods used: 1. The AMTI Netforce platform (Hardware and Software), 2.Using the postural balance measurement from AMTI Netforce for: a) eyes opened no aiming point, b) eyes opened with aiming point. *Results.* After the statistical analysis we have the following: a) for the initial test: M_{LI}=152218.44, SD_{LI}=113973.166 (for the trajectory length of center of gravity) and M_{AI}=15328.81, SD_{AI}=3465.370 (for the trajectory area of center of gravity); b) for the final test: M_{LF}=5960.86, SD_{LF}=5283.156 and M_{AF}=2613.83, SD_{AF}=1564.17. *Conclusions*. These results suggest that the visual control really does have an effect over the balance control of the tennis players. Specifically, our results suggest that when the subject has a visual way to control his posture, the balance control increases.

Key words: balance, visual control, sport, psychology, cognitive control

REZUMAT. ***Controlul vizual al echilibrului postural la sportivii care practică tenis de câmp.*** *Premize*. Procesele controlului cognitiv includ o amplă clasă de operaţii mentale care includ reprezentanţa şi menţinerea obiectivelor şi a contextului. Totodată controlul cognitiv include şi procesele strategice precum alocarea atenţiei şi formarea hărţii stimul-răspuns. Controlul cognitiv este asociat cu o largă paletă de procese care nu este restrânsă la un domeniu cognitiv particular. *Obiective*. Obiectivele acestui studiu au fost: 1. Determinarea ariei si a lungimii traiectoriei proiecţiei centrului de greutate utilizând platforma AMTI Netforce, 2. Identificarea influenţei stimului vizual în controlul echilibrului postural. *Metode*. Metodele folosite: 1. Platforma de forţă AMTI Netforce (Hardware

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și Software), 2. Utilizarea platformei AMTI Netforce pentru a măsura echilibrul postural: a)cu ochii deschişi fără reper, b) cu ochii deschişi cu reper. *Rezultate*. După prelucrarea statistică a datelor avem următoarele: a) pentru testul inițial: M_{LI}=152218.44, SD_{LI}=113973.166 (pentru lungimea traiectoriei centrului de greutate) and M_{AI}=15328.81, SD_{AI}=3465.370 (pentru aria traiectoriei centrului de greutate); b) pentru testul final: M_{LF}=5960.86, SD_{LF}=5283.156 and M_{AF}=2613.83, SD_{AF}=1564.17. *Concluzii*. Aceste rezultate sugerează existența unui control vizual ridicat al echilibrului postural la sportivii care practică tenis de câmp. În special rezultatele noastre sugerează că atunci când sportivul are posibilitatea de a-și controla postura, controlul echilibrului crește.

Cuvinte cheie: echilibru, control vizual, sport, psihologie, control cognitiv

Background

"Cognitive control" is a construct from contemporary cognitive neuroscience that refers to processes that allow information processing and behavior to vary adaptively from moment to moment depending on current goals, rather than remaining rigid and inflexible. Cognitive control processes include a broad class of mental operations including goal or context representation and maintenance, and strategic processes such as attention allocation and stimulus-response mapping. Cognitive control is associated with a wide range of processes and is not restricted to a particular cognitive domain. For example, the presence of impairments in cognitive control functions may be associated with specific deficits in attention, memory, language comprehension and emotional processing. Given its pervasive influence, impaired cognitive control could account for many of the widespread impairments exhibited by people with schizophrenia and other neurodevelopmental disorders. (Carter & Cho 2004)

It is the set of brain processes necessary for goal-directed thought and action. Remembering a phone number before dialing requires cognitive control. Also, anything outside routine requires cognitive control (because it's novel and/or conflicting with what you normally do). This includes, among other things, voluntarily shifting attention and making decisions. (Cole & Schneider, 2007)

A mountain of evidence is accumulating that a common set of brain regions are involved in cognitive control. We looked for these regions specifically, and verified that they were active during our experiment. The brain regions are spread across the cortex, from the front to the back to either side. However, it's not the whole brain: there are distinct parts that are involved in cognitive control and not other behavioral demands. We defined the cognitive control network as the parts of the brain active during a line search task. This

task involves remembering a target line orientation, attending to each probe line orientation, and making a decision about whether each probe is what is being looked for. We then looked at spontaneous neural activity during rest periods to measure how the network's regions are connected. (Cole & Schneider, 2007)

Cognitive controls are defined by Klein et al. (1959) as ego structures or stable organizational dispositions that regulate thought processes. In psychoanalytic terminology, they are characterized as secondary thought processes that produce consistency in a person's perceptual, memory and thinking activities. Cognitive controls are assumed to be relatively "conflict-free" mechanisms and are thought to reflect an individual's customary modes of facing reality.

A cognitive control is thought to unfold in a behavioral sequence that is integrated by an intention or aim, e.g., to judge size in an experiment. Cognitive controls are considered to be the organizing principles that guide the interplay of perceptual, memory and motor processes and the determiners of cognitive responses. A given cognitive control is thought to operate within a limited range of situations that pose similar adaptive requirements. Thus the ability to generalize behaviors particular to a given control are dependent upon the requirements of a given situation. Klein et al. (1959) assume that there are a finite number of cognitive controls and that they are idiosyncratically organized within each individual. It is assumed that cognitive controls interact, serving alternately as an intermediary, catalyst or initiator of behavioral tendencies.

Hypothesis

Visual control influences the postural balance in field tennis players.

Methods and materials

Subjects

The subjects of this study were 20 student-athletes enrolled in the tennis learning courses at the Faculty of Physical Education and Sport at the Babes-Bolyai University, and they were between the ages of 19 and 21 years old. The whole tennis course was 4 months long, therefore allowing us to see if there was an effect over the subjects.

Methods and the Steps of the Research

We used the AMTI Netforce platform for the initial and final test. The test consists of measuring the balance quality with and without a visual aiming control. The software from the force platform laid out, among others, two

measurements for each subject called: length (measured in cm) and area of the center of gravity's projection (measured in cm^2).

The initial and the final measurements correspond with the moment they finished the course, because we wanted to see if there was a better or worse balance control regarding the existence or non-existence of a visual control.

We compared these two measurements for two different situations:

1. The subjects had no visual reference aiming point; they had to look at a blank wall;
2. They had a small target placed on the wall.

The values of the gathered data were analyzed using SPSS 17.0 and the test used was paired sample t-test because we wanted to see if the visual control variable had an influence over the postural balance.

Results

Table 1.

Paired sample statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Lung_I	152218.44	20	113973.166	25485.175
	Lung_F	5960.86	20	5283.156	1181.350
Pair 2	Area_I	15328.81	20	3465.370	774.880
	Area_F	2613.83	20	1564.170	349.759

Table 2.

Paired sample correlations

		N	Correlation	Sig.
Pair 1	Lung_I & Lung_F	20	.497	.026
Pair 2	Area_I & Area_F	20	.332	.153

Table 3.

Paired sample test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Lung_I - Lung_F	146257.582	111439.658	24918.665	94102.216	198412.947	5.869	19	.000
Pair 2	Area_I - Area_F	12714.983	3295.277	736.846	11172.746	14257.220	17.256	19	.000

Discussion of the results

For the trajectory length of the center of gravity, there was a significant difference in the scores for the initial test stage(M_{LI}=152218.44, SD_{LI}=113973.166) and the visual control stage(M_{LF}=5960.86, SD_{LF}=5283.156); tv(19)=-5.869, pv=0.000. These results suggest that the visual control really does have an effect over the balance control of the tennis players. Specifically, our results suggest that when the subject has a visual way to control his posture, the balance control increases.

For the trajectory area of the center of gravity, there was a significant difference in the scores for the initial test stage (M_{AI}=15328.81, SD_{AI}=3465.37) and the visual control stage (M_{AF}=2613.83, SD_{AF}=1564.170); ta(19)=17.256, pa=0.000. These results suggest that the visual control really does have an effect over the balance control of the tennis players. Specifically, our results suggest that when the subject has a visual way to control his posture, the balance control increases.

Conclusions

All in all our study has shown that, regarding field tennis, the balance control is tightly linked with the visual control that a player has. Considering the fact that the values for the length and area of movement of the center of gravity have improved we can determine that field tennis training can increase the balance control with a visual marker.

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STUDY OF ADAPTATION PSYCHOMETRIC INSTRUMENTS THAT MEASURE ANXIETY, SELF-EFFICACY AND MOTIVATION FOR SPORT PERFORMANCE

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ABSTRACT. Research has shown that human intelligence was encouraged thinkers since antiquity. Since Plato (428 IH), Aristotle (384 IH), Augustine (354 IH) and until today. Numerous studies have been published with the aim to verify the effectiveness of psychological intervention programs to increase athletic performance (Greenspan and Felz, 1989 Vealey, 1994; Weinberg and Comar, 1994). From a total of 45 trials, 38 of them, then 85% were found positive effects on performance. Psychological methods, techniques and strategies refer to practices which lead to psychological skills. Each of psychological methods, if properly learned and applied, leading to psychological skills. Examples of psychological skills: intrinsic motivation, self-confidence, attention control, activation control, control anxiety. (Christmas M. 2005).

The main objective of this study is to adapt and check psychometric properties of the scales chosen to measure motivation, anxiety and self-efficacy.

Key words: psychometric instruments, anxiety, self-efficacy, motivation

REZUMAT. ***Studiu de adaptare a instrumentelor psihometrice ce măsoară anxietatea, autoeficacitatea şi motivaţia pentru sport de performanţă*.** Cercetările au demonstrat faptul că inteligenţa umană a stârnit interesul gânditorilor încă din Antichitate. Începând cu Platon (428 I.H.), Aristotel (384 I.H.), Augustin (354 I.H.) şi până în zilele noastre. Numeroase studii au fost publicate cu scopul declarat de a verifica eficacitatea programelor de intervenţie psihologică în creşterea performanţei sportive (Greenspan şi Felz, 1989; Vealey, 1994; Weinberg şi Comar, 1994). Dintr-un număr de 45 de studii, 38 dintre ele, deci 85%, au găsit efecte pozitive asupra performanţei. Metodele psihologice, tehnicile sau strategiile, se referă la practicile care conduc la dezvoltarea abilităţilor psihologice. Fiecare din metodele psihologice, dacă sunt învăţate şi aplicate corect, duc la dezvoltarea abilităţilor psihologice. Exemple de abilităţi psihologice: motivaţia intrinsecă, încrederea în sine, controlul atenţional, controlul activării, controlul anxietăţii. (Crăciun M. 2005). Obiectivul principal al acestui studiu este de adaptare şi verificarea proprietăţilor psihometrice ale scalelor alese pentru a măsura motivaţia, anxietatea şi autoeficacitatea.

Cuvinte cheie: instrumente psihometrice, anxietate, autoeficacitate, motivaţie

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In this study we chose to focus on three psychological factors, anxiety sports performance, sports performance motivation and self-efficacy. We chose these three factors from the theoretical principles of cognitive behavioral psychology that explain achievement behavior through behavioral ABC model. ABC model of behavior is based on Skinner's original model (1974), but is supplemented with information derived from modern research (Albert Bandura and Julian Rotter) on information processing that each individual derives the stimuli. This model argues that stimuli, either internal or external causes in terms of information processing at which they are subject, performing a certain behavior.

Self-efficacy, anxiety and motivation are important antecedents that may affect the realization of behavior. Thus, a high level of anxiety could adversely affect the performance of the athlete, while a high level of efficiency and self-motivation positively influence the performance of an athlete.

Regarding the feeling of self-efficacy, studies suggest that it has a positive role in perseverance and athletic performance, being associated with lower levels of competitive anxiety (Pajares, 2005; Parks, 2005).

Bandura (1977, 1986, 1997) defines the concept of self-efficacy as the belief of being able to successfully execute a specific task in order to achieve a particular outcome (egg, self-recognition or recognition of the coach). Since the first publication of the concept of self-efficacy (Bandura, 1977) were published over 60 research articles specifically related to sports performance (Moritz, Feltz, Mack and Fahrbach, in press).

The self-efficacy developed by Bandura checks the powerful and sporty.

Perceived self-efficacy is a strong and consistent predictor of athletic performance (Schunk, 1995). As a general rule, compared to people who doubt their capabilities, those with a sense of high self-efficacy work harder, persist in the task and reach a higher level of performance (Christmas,2008).

Dzewaltowski (1989) report a positive relationship between behaviors associated with exercise, intention, attitude and self-efficacy.

Dzewaltowski et al. (1990), Courtney & McAuley (1993), Dishman (2001), and Hagger et al. (2002) shows that there is a moderate correlation between self-efficacy and participation in physical activities both young adults and the older ones, and Yordy & Lent (1993) and Armitage & Conner (1999) argue that self-efficacy is an important predictor for physical activity. According to the study by Brawley & Martin (1995), self-efficacy cover between 3 and 25% of the variance in behaviors associated with activity and exercise (Chiu & Kayat, 2010).

Regarding motivation, Brasile and Hedrick (1991) showed that motivational factors are paramount: integration into a group with social interaction, recognition, respect and sense of belonging. This type of sports

participation and strengthen factors are often encouraged by friends, family and health professionals.

Motivation is the center of many of the most interesting sports both as a result of the development of social media, such as competition and behavior of coaches, and the influence of development on behavioral variables such as persistence, learning, and performance (Duda, 1989; Vallerand, So & Ryan, 1987). Given the importance of these consequences for athletes, can easily understand the interest of researchers linked to motivation as it relates to sport. Several conceptual perspectives have been proposed to better understand the motivation of athletes (Roberts, 1992). One view has been shown to be useful in this field posit that behavior can be intrinsically motivated, extrinsically motivated, or unmotivated (So, 1975, So & Ryan, 1985, 1991). This theoretical approach has generated a considerable amount of studies that are relevant to sport (Bribri, Vallerand, Blais and Pelletier, in press, So & Ryan, 1985, ch. 1, Fortier, Vallerand, Brikre and Provencher, in press, Vallerand, So Ryan, 1987).

Unmotivation form of motivation is similar to the concept of "learned helplessness" (Abramson, Seligman & Teasdale, 1978). There is no intrinsic motivation, but extrinsic. When athletes are in such a state, they no longer identify good reasons for them to continue training. Eventually they may even decide not to practice their sport.

In the anxiety this is a concept that is widely discussed by athletes and sports professionals. People involved in competitive sports should be aware of the symptoms related to anxiety. Once aware of the situation, it would be prudent to deal with anxiety issues.

According to Kremer and Moran (2008) a reason to have a tendency to be tense before the competition could be related to the pressure of being noticed. Spectators at any sport constantly evaluates the abilities of athletes, looked, and this can be extremely daunting for those who are not prepared to deal effectively with this pressure. Not wanting to fail can strain bunch more on a player when they are aware of being observed and the stress continues to increase.

For a lot of athletes anxiety can be a very unpleasant feeling, physiological symptoms, including increased heart rate, sweaty palms and muscle tension. In fact, Ray and Weise-Bjornstal (1999) highlighted seven possible categories in which an athlete can experience stress, including emotional, cognitive and behavioral.

Anxiety stems from concern over the lack of control over circumstances (Mind, 1999). During a competition, the adrenaline can be released. Liberation of adrenaline may have positive and negative effects. Among the positive effects include alertness, physiological arousal that the body is prepared for

explosive activity (Mind, 1999). Athletes and their support system should identify stressors and then formulate an individualized plan to manage stressors. Shame and embarrassment are constant threats in sports because the game is usually played in front of people (Ferraro, 1999).

Given the influence of these factors, as shown above, we pursue the research project to measure these three concepts and to influence them in a psychological intervention on athletes. In this respect, this study aims to examine the psychometric qualities of the instruments selected to measure these concepts.

Objectives

The primary objective of this study is the adaptation and evaluation of the properties selected psychometric scales to measure motivation, self-efficacy, and anxiety.

Method

The first step was to adapt the scales from English into Romanian. For translation into Romanian were recruited two independent translators. Translators were one year master's students in clinical psychology with Cambridge Advanced Certificate in English.

There were some differences between the two versions. Differences were not significant for the purposes of item. Some items were hard to understand. These were discussed by coordinating with an independent expert (psychologist), decided which version is the best.

Back translation was done by two psychologists who speak Romanian; with very good English skills (I could not locate native English speakers who are experts in Romanian).

There were some differences between the two translations. A native English speaker (an exchange student came from a university in Europe, the Faculty of Psychology) was asked to examine the two versions and see if there were significant differences that affect meaning elements. Graduate student concluded that there were no such differences - some differences were probably due to our translators use limited vocabulary but did not affect the meaning. There were some minor adjustments made to the pilot version of the questionnaire.

In addition we added a question on each questionnaire exercise. This question does not enter the final score of the test; its purpose is to familiarize children with the look questionnaire and how to answer the question. They helped to answer the questions we added to each a visual landmark

Subjects

Final versions translated the scales were applied on a sample of 110 athletes from nine sports specialties. Some sports such practices are both individual sports and team (gymnastics, martial arts, athletics, swimming, football, volleyball, table tennis, dance sport, judo.).

Athletes were 44 boys and 66 girls aged 6-12 years (mean 8 years) (descriptive data).

Table 1.

Descriptive data about the subjects included in the study representing the age and sex

N=110				
Age	M=8	Min.=6	**Sex**	f=66
	Max.=12			m=44
Sports Practiced	**Number of subjects**	**Sex f m**		**Retest subjects**

Table 2.

Descriptive data about the subjects included in the study representing disciplines practiced

Gimnastics	21	18	3	15
Dance	14	14	0	7
Judo	9	6	3	5
Ping – pong	10	5		5
Swimming	10	5	5	4
Athletics	10	4	6	4
Football	12	0	12	5
Basketball	6	6	0	0
Karate	18	8	10	12

Instruments

1. Thus, performance anxiety in sport have chosen to measure the scale Sport Anxiety Scale-2 (SAS-2) (SAS-2 Smith, R.E., Smoll, F.L., Cumming, S.P. and Grossbard, J.R., 2006). The gauge contains a number of 15 questions (items), which allows measurement of multidimensional sport performance anxiety by measuring individual differences in somatic anxiety, care and concentration disturbance, to be studied antecedents and consequences of cognitive and somatic anxiety performance in children.

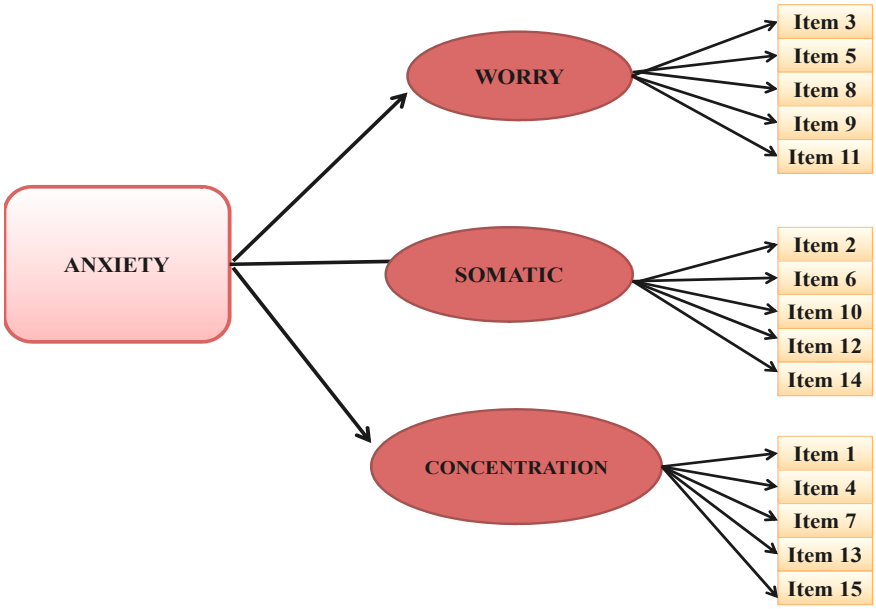

Figure 1. Confirmatory factor analysis of the SAS-2 items

Each question has 4 possible answers, choose one option that fits. The first option means at all (not afraid at all), the second option means little (afraid least) the third variance means pretty much (you're pretty much afraid) and latter means a lot (and very scared).

2. Motivation for sports performance we chose to measure the scale The Sport Motivation Scale (SMS-28) (Pelletier, L.G., Fortier, M.S., Vallerand, R.J., Tuson, K.M., Briere, N.M. and Blais, M.R., 1995). The scale comprises 28 questions (items), which measures the intrinsic motivation (to know, to succeed, to be stimulated), extrinsic motivation (identification, introjections, external regulation) and unmotivation. On this scale, loose I added a subscale measuring desire to obtain performance in sports.

The motivation scale original version built for adults allows the calculation of scores on the subscales to identify different types of motivation (ie, to know, to succeed, to be stimulated, and so on). Applying this scale in children aged 6-12 years questions have been modified either to structure or content as to be applicable to children. So as not to affect the validity of the subscales we will use in the research project only the total score.

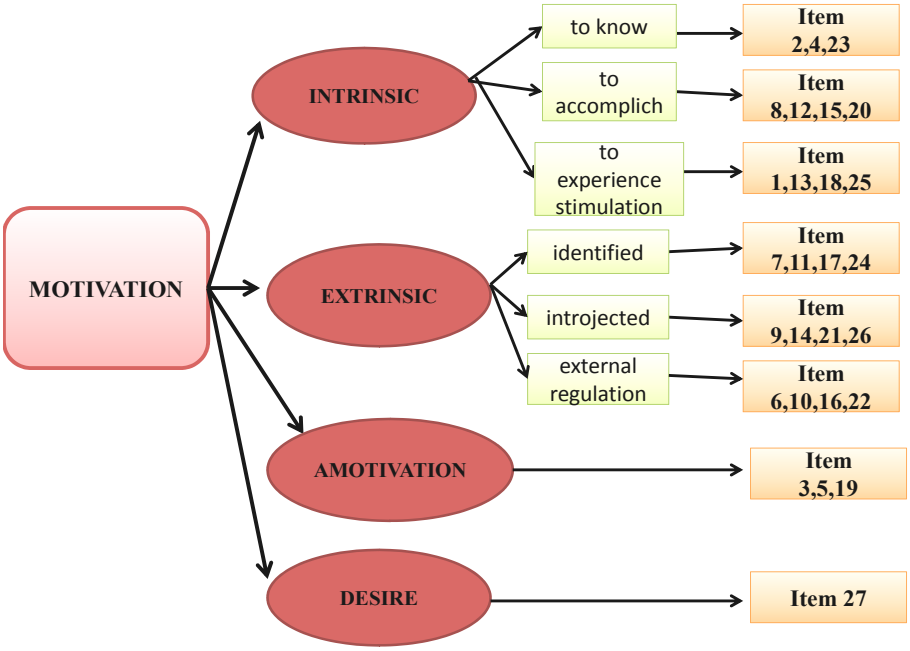

Figure 2. Confirmatory factor analysis of the SMS items

Each question has 4 possible answers, choose one option that fits. The first option is not a reason (not that doing sports), the second version is little reason (this is one reason for coming to the sport, but one small), the third option is good reason (this is a good reason for coming to the sport) and latter very important reason (this is a very important reason).

3. For self-efficacy for sports performance, we chose to measure the scale Physical Activity Self-Efficacy Scale (PASES) (Bartholomew, J.B., Loukas A.E., Jowers, M. and Allu, S., 2006). Version adapted and calibrated for the Romanian population was adapted to assess self-efficacy in relation to sports. In this study, we used the items as they were translated and presented.

Self-efficacy scale includes 8 items that can be ranked from 1 to 4 (1 - scarcely 2 - Not so good 3 - may well, 4 - may very well).

Although a number of investigations since the self-effective approach as a general rule self-efficacy is conceptualized as being specific.

The self-efficacy scale in addition to the 8 questions of scale we added four questions specific to each sport. Self-efficacy is a construct specific area; the more accurate question is relevant both measured construct (Bandura). The four questions were constructed for nine sports that were included in this

study to have a variety of results for validity many sports. Pt. each subject three experienced coaches were asked to define and describe four essential skills for performance in that sport. Based on discussions of these experts were selected 4 questions containing those features on which there was anonymous.

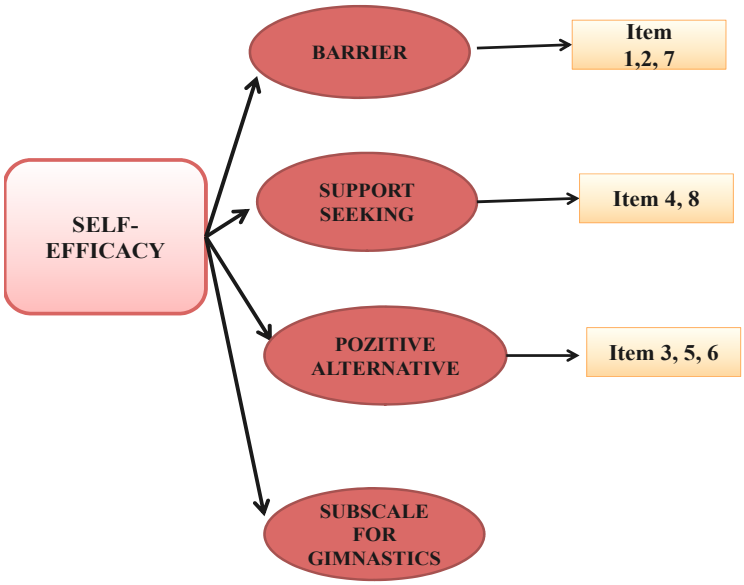

Figure 3. Confirmatory factor analysis of the PASES items

Procedure

Individuals were contacted through various ways and in various places.

Athletes were contacted by coaches and parents, who were asked to sign an agreement that has been specified for research and deployment algorithm.

Questionnaires were given a code number, so that participants can respond anonymously, and were offered for completing the A4 envelope so that submissions remain confidential and at the same time facilitate the collection of questionnaires.

The 3 scales were applied athletes translated by an assessor who read the questions and answer surrounded by sports. The questionnaires were applied individually, without time limit. Given the age of the children have chosen this to maximize the reliability of the data collected. Out of the tested athletes I reapplied the same questionnaires after 6 weeks to measure the stability of the results.

Results

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

We analyzed scales adapted in terms of their fidelity. Fidelity refers to a psychological test scores obtained expresses the extent to which the actual values of the construct that the test is measuring. Test translation, adaptation of another language can lead to some changes in the perception and understanding of the construct measured. It is therefore important to measure fidelity. This has two aspects: internal consistency and stability over time results.

Internal consistency is the extent to which items measure the same variable. We analyzed the internal consistency alpha Crombach method.

Table 3.

A coefficient for internal consistency
Crombach Anxiety Scale Performance in Sports

SAPS	α Crombach
Total	0.892
Subscale Somatic	0.687
Concern	0.761
Impaired concentration	0.826

For **Anxiety Scale Sport Performance** Crombach α value is 0.892, indicating a high reliability of the scale (Murphy and Davidshoper 1998). The analysis shows loyalty subscale indices for 0.687 worth subscale somatic subscale value of 0.761 to 0.826 for anxiety and impaired concentration subscale. These indices indicate medium and high fidelity.

Table 4.

Coefficient for internal consistency
Crombach Anxiety Scale Performance in Sports

SAPS	α Crombach
Total	0.892
Subscale Somatic	0.687
Concern	0.761
Impaired concentration	0.826

For **Motivation Scale for Sport Performance** Crombach α value is 0.850, indicating a high reliability of the scale (Murphy and Davidshoper 1998).

Table 5.

Coefficient for internal consistency
Crombach Motivation Scale for Sport Performance

SMSP	α Crombach
Total	0.850

For **Self-Efficacy Scale** for sports performance for the 8 questions that show self-efficacy for physical condition score is 0.769 which indicates a fairly large scale. For the 4 questions we built examined the internal consistency for the 9 sports. Thus gymnastics internal consistency coefficient is 0.831 which indicates a high fidelity. Dance coefficient is 0.789 which indicates a high fidelity. For judo coefficient is 0.772 which indicates a high fidelity. Table tennis coefficient is 0.108 which indicates a very low fidelity. For swimming coefficient is 0.194 which indicates a very low fidelity. For athletics coefficient is 0.481 which indicates a low fidelity. For soccer coefficient is 0.348 which indicates a very low fidelity. Basketball coefficient is 0.789 which indicates a high fidelity. For karate coefficient is 0.626 which indicates a moderate to low fidelity.

Outside subscales for swimming, table tennis, athletics and soccer subscales have good internal consistency indicating that the questions measure the same construct. Of interest to us is the great value of the subscale for the gym that will be used later in the research project.

Table 6.

Crombach α coefficient for internal consistency of
self-efficacy Scale for Sports Performance

SASP		α Crombach
Total		0.769
Subscale	Gimnastics	0.831
	Dance	0.789
	Judo	0.772
	Ping-pong	0.108
	Swimming	0.194
	Athletics	0.481
	Footbal	0.384
	Basketball	0.789
	Karate	0.626

Stability of the results indicates the extent to which different applications as subject similar results. For constructs that do not vary over time stability is an indicator of loyalty construct. Anxiety, motivation, self-efficacy in the absence of an intervention on athletes should not vary within a short time. To check the stability of time we calculated the correlation coefficients between the first and second application of the subscales. For this analysis we have a lot of 57 athletes were reapplied to the same scale. The results show very high correlation between the first and the second application.

Anxiety score is 0.998

Motivation score is 0.995

Self-efficacy score is 0.997

To be specific subscale self-efficacy sport whose long-term stability is very high (0.999).

Table 7.

Correlation coefficients (Pearson) between the first and second application of the scales Anxiety Scale Performance in Sport (SAPS)

CORRELATION			
		Score SAPS	Scor SAPS 2
Score SAPS	Pearson Correlation	1	0.998
	Sig. (2-tailed)		0.01
	N	57	57
Score SAPS 2	Pearson Correlation	0.998	1
	Sig. (2-tailed)	0.01	
	N	57	57
Correlation is significant at 0.01 (2-tailed)			

Table 8.

Correlation coefficients (Pearson) between the first and second application of the scales Motivation Scale for Sport Performance (SMSP)

CORRELATION			
		Score SMSP	Score SMSP 2
Score SMSP	Pearson Correlation	1	0.996
	Sig. (2-tailed)		0.01
	N	57	57
Scor SMSP 2	Pearson Correlation	0.995	1
	Sig. (2-tailed)	0.01	
	N	57	57
Correlation is significant at 0.01 (2-tailed)			

Table 9.

Correlation coefficients (Pearson) between the first and second application of self-efficacy scales Scale for Sport Performance (SASP) specific to each sport

CORRELATION			
		Score SASP specific	Scoer SASP 2 specific
Score SASP specific	Pearson Correlation	1	0.999
	Sig. (2-tailed)		0.01
	N	57	57
Score SASP 2 specific	Pearson Correlation	0.999	1
	Sig. (2-tailed)	0.01	
	N	57	57
Correlation is significant at 0.01 (2-tailed)			

With these results in a relatively broad group of athletes we calculated for each scale range part that fits a low score, medium and large to enable us to report the results of future studies that will include smaller samples and size. Thus we calculated average scores range considering the mean and standard deviation of scores obtained. A low score is below average - one standard deviation and a high score is above the mean + 1 standard deviation. The range of mean ± 1 standard deviation indicates an average score.

To lower anxiety score is <17, higher than 30, medium 17-30

For low motivation score is 68, high is 92 and 69-91 is medium

For small sub self-efficacy score <25 (0-24) and the high score is> 33, between 25-32 average.

Specific self-efficacy small <10, high 18, average 10 to 18

Table 10.

Mean and standard deviation for the 3 scales

Media	Standard deviation		
Scale	Score low	Score medium	Score high
SAPS	≤ 17	18-29	≥ 30
SMSP	68	69-91	92
SASP	≤ 25	26-32	≥ 33
SASP specific	≤10	11-17	≥18

Discussions

Our main objective was to adapt three scales that measure three psychological factors relevant to sport performance. I also wanted to check the psychometric properties of the variants in Romanian. To this end we analyzed the feature fidelity tests. Being an adaptation we examined the validity of the

test as it is not affected by the scale and adapt its translation into another language. Our results showed that the performance Anxiety Scale translated into Romanian sport version has a very good fidelity first expressed both internal consistency coefficients and the time stability analysis results.

For Motivation Scale for Sport Performance Our results again show good psychometric properties with a very high coefficient of internal consistency and good stability over time. The self-efficacy scale for athletes to physical activity is a high internal consistency and stability of the very good results.

The sport -specific self-efficacy subscale had results that showed good stability while the results for each of the nine sports , but the internal consistency analysis results are good only for subjects gymnast, dance, karate, judo and basketball, these subscales can be used to further study the ability of self-efficacy measure specific sport. Subscales for swimming, table tennis, football and athletics should be resumed and analyzed composition of items to have adequate psychometric properties is before being used in other studies. Relevant research project is the result obtained for the subscale of the gym, so we can use this to measure the self-efficacy subscale of the gymnasts' performance to be included in the research project. The application of these scales in a group of athletes spread allowed us guidance and calculation rules that we use in future studies.

Conclusions

In conclusion the three scales adapted subscale built new gym have good psychometric properties that will allow us to adequately measure the level and evolution of these three constructs in an intervention project to increase sports performance and emotional adjustment in performance gymnasts.

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STRUCTURED PROGRAMS OF PHYSICAL ACTIVITY IN THE AQUATIC ENVIRONMENT FOR PARTICULAR GROUPS OF PEOPLE

FELIX MIHAIL STĂNESCU[1,*]

ABSTRACT. Physical exercise in water is the most appropriate method for developing or maintaining fitness, weight control, to prevent degeneration of functional systems of the body, either due to aging or the lack of regular physical activity, for people of any chronological or organic age, without being tied to the level of functionality or mobility of the body. This method gives the specialist precise control of the impact on joints and tendons and on the heart rate and blood pressure during exercise. The potential of the proposed method is significant; the results obtained so far in recovery or rehabilitation therapies, as well as in the area of educational and recreational activities, are indisputable and make physical activity in the aquatic environment to be the most recommended or prescribed, when necessary, by professionals of the physical activity or by doctors. ACSM and AHA recommend structured programmes of physical activity with minimum 30 minutes duration for at least 3 days per week (not consecutively), in order to follow up the stimulation of oxidative metabolism through out aerobic exercises, together with exercises for improving muscular resistance and articular mobility.

Keywords: special groups of people, aquatic environment, structured programs.

REZUMAT. ***Programe structurate de activitate fizică în mediul acvatic pentru grupuri speciale de persoane.*** Exerciţiul fizic în apă este metoda cea mai indicată pentru dezvoltarea sau menţinerea, fitness-ului, a controlului greutăţii corporale, pentru prevenirea degenerării sistemelor funcţionale ale organismului, fie datorate procesului de îmbătrânire, fie prin lipsa activităţii fizice regulate, la persoane de orice vârstă cronologică sau biologică, fără a fi condiţionat de gradul de funcţionalitate sau mobilitate al organismului. Această metodă permite specialistului un control precis al impactului asupra articulaţiilor şi tendoanelor şi asupra frecvenţei cardiace şi a tensiunii arteriale în timpul efortului. Gradul de aplicabilitate al unor astfel de programe este foarte ridicat, ţinând cont că se pot desfăşura activităţi atât în piscine acoperite, cât şi în piscine în aer liber, în lacuri sau râuri pe porţiunile amenajate pentru agrement, dar şi pe malul mării. Potenţialul metodei propuse este semnificativ,

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rezultatele obţinute până în prezent atât în terapii de recuperare sau reabilitare, cât şi în aria de activităţi educative şi recreative, sunt incontestabile şi fac ca activitatea fizică în mediul acvatic să fie cea mai recomandată sau prescrisă, atunci când este cazul, de către profesionişti ai activităţilor fizice sau de către medici.

Cuvinte cheie: grupe speciale de persoane, mediu acvatic, programe structurate.

Introduction

Common pathologies of a developed society are the main cause of sick leaves and expenses in the budget for health:

The contemporary modern society we live in generates a series of unhealthy behaviors among the masses, leading to the development of a number of common pathologies both in our country and in the European Union, namely:

- Chronic lumbar or cervical pain
- Osteoporosis, arthrosis, arthritis or rheumatism
- High blood pressure
- High cholesterol level
- Diabetes type II
- Depression, anxiety
- Varicose

All these pathologies, through the size they have touched and the subsidies from the state budget that the public health system needs in order to deal with them, is actually, a real "epidemic" of the XXI century that absolutely require finding and implementing viable solutions for control and prevention (Warburton, 2006).

Objectives

The benefits obtained from physical activity in the aquatic environment, either by valuing those directly related to practice or specialty training or through their effects on health risk factors are:

- Improving blood circulation and heart function;
- Improving lung function;
- Maintaining and improving joint mobility;
- Balanced muscle development;
- Lowering the pressure on the backbone;
- favoring relaxation;
- Developing self-confidence and balance;
- sleep benefits;

- Increases appetite;
- Favors socio-emotional relationships.

Justification

XXI Century - **"epidemiological transition"**

- 60 % of current mortality in developed countries is caused by diseases related to the lifestyle;
- It is expected that this figure will rise to 75 % in 2020;
- 40 % of young people of 15 years old in the EU states declare that do not conduct regular sports activities (Fuster, 2009).

The effects of a sedentary lifestyle, generated especially by the characteristics of a technological society and the lack of adequate education of the population are:

- Hypercholesterolemia;
- High blood pressure;
- Positive energy balance- obesity;
- Diseases of the locomotor system;
- Diabetes mellitus;
- Anxiety.

Among the leading causes of mortality, there are the following pathologies: cardiovascular diseases, hypertension, acute myocardial infarction, diabetes mellitus type II, osteoporosis, breast and colon cancer. For them it was shown that sports activity performed regularly, as part of a **healthy lifestyle is protective** (Myers, 2002).

Since antiquity Ancient Greece passed a memorable and valid concept throughout civilizations: "Mens Sana in Corpora Sano" (healthy mind in a healthy body).

This ideal is based on the "five laws of health":

- Breathe fresh air;
- Eat healthy foods;
- Drink only natural beverages and in a proper form;
- Practice physical exercise;
- Adequate sleep (Hippocrates of Cos - 460-370 BC., Claudio Galeno – first century BC).

Public Health Strategies

• Promoting a healthy lifestyle:

- Performing organized sports activities to enhance the health of individuals and communities they belong to, promoting the adoption of a healthy lifestyle and a healthy environment;

• Health protection:

- Development of actions directed **to control the environment,** in its largest sense: at work, in public transportation means, etc.

• Efficiency as the main criterion:

- Effectiveness, efficiency
- Performance of sports activities to achieve the desired effect.

• The Health System vs. Sanitary System

- Developing a national system for health improvement which would generate lower costs in the sanitary system (Aguado, 2005).

Materials and work methods

Structured Programs vs. Unstructured Programs:

Structured Programs are those programs of physical activity performed in closed spaces, specially designed for various sports activities (paddle, squash, fitness, aqua gym, swimming, indoor football, basketball, handball, volleyball, aerobics, gymnastics, etc.), with fixed schedule and controlled by specialists (trainers, coaches, teachers).

Unstructured programs are those physical activities carried out on their own by the population, without an well-established schedule, not controlled by a specialist and, generally, organized outdoors, arranged by the local administration (multi-sportive terrains, bike trails, parks and recreational spaces, etc.) (Lopez-Grueso, 2009).

Structured programs are recommended to the detriment of the unstructured ones, because they can be controlled and adjusted as necessary (customized training), thus avoiding possible injury or other complications of the functional systems required, caused by improper programming of intensity and volume of the exercise, corresponding to each category of users.

Participants

By **Special Groups** we understand all those persons who are functionally limited in a permanent or temporal form, due to one or more affected systems, requiring both an appropriate adjustment in the amount of exercise and its intensity, specific to each category, as follows:

- Persons with physical and psychiatric disabilities
- Third age persons, over 45 years old
- Children in Pediatric Stage (0-4 years old)
- Pregnant women

- Cardiovascular Diseases
- Respiratory Diseases
- Obesity and poor nutrition (weight control)
- Diabetes Mellitus (Type I and II)
- Diseases of the Locomotor Apparatus (osteoporosis, arthritis, etc.).

Aquatic environment - environment with antigravity features

The aquatic environment has been used as a therapeutic agent since ancient times, by the great civilizations such as Greece and Ancient Rome, China, India, or Japan. Nowadays we live in a time of great interest related to the balneology and hydrology. For more than 20 years, swimming is used as complementary medium of different therapies available. Specifically, specialist doctors (traumatologist, rheumatologists, cardiologists, oncologists, etc ...) in clinics, hospitals or health centers, prescribe their patients the participation in therapeutic swimming programs due to the countless benefits that the aquatic environment brings to the human body.

There are three major **perspectives related to the activity in the aquatic environment**:

1. Recovery Perspective
2. Preventive Perspective
3. Recreation Perspective

The aquatic therapy facilitates movement, which is due to several factors: reduced gravity force, floating action, hydrostatic pressure and water temperature. Buoyancy effect reduces the axial load of the spine, allowing movements hard to realize on land or even impossible for certain groups of patients. Also, due to the hydrostatic pressure, heart rate is lower by 10 beats per minute than on land, however, depending on the level of submersion of the body (Tuero, 1995).

Intervention protocol for different patient groups

1. Initial evaluation and determination of risk factors:
- Par-q (practice questionnaire of the physical activity)
- Health questionnaire
- Informed consent form
2. Exercises against Resistance Evaluation
3. Evaluation of Cardiorespiratory Resistance
4. Assessment of the Flexibility and the Spine
5. Anthropometric Assessment

Structuring Model of a session:

Table 1.

Model developed by Felix Stănescu

Provided activities	Active mobilization exercises of body segments	Combination of head-arms-legs movements with respiration	Compensating exercises
Objectives	- Strengthening connective and contractile tissue, - Improving force against resistance, - Aerobic capacity development, - Developing flexibility.		
Materials	Aquatic pulsometer, floating stick, gym weights, swimming raft, swim fins, pullpush.		
Group	8- 12 patients, 1- 3 auxiliary volunteers		
ATTENTION!	- Rapid fatigue in the aquatic environment; - Body thermoregulation (attention to color and lips); - Possible breathing difficulties.		

Warming up	10-15 min
- general: 40- 60% VO2max, 55 - 70 Fcmax; - stretching: 3x15-30 sec/ muscular group, 90 - 100% ROM; - specific: intensity 100%, intermittent actions 2 - 8 sec, 85% of VAM, active recovery	
Main Part	30- 40 min
- Development of lower body muscle strength: 3x10-15 rep., 1-3 min. recovery, execution speed: high- very high; - Development of upper body muscle strength: 3x8-12 rep., 1-3 min. recovery, execution speed: high- very high; - Development of cardio-respiratory resistance: 4 - 6x1-2 min., 2-5 min. rec., average execution speed; - Improving balance and postural control: 8-12x1 min., 30 sec. - 1 min. rec., execution speed: Medium-high.	
Return to Calm	5 min
- 40- 60% VO2max, 55 - 70 Fcmax; - Stretching: 2x15 - 30 sec/ muscular group.	

Discussion

The value of an Active Lifestyle is reported to the quantity - quality of physical activity performed:

Promoting Physical Activity is a great **Public Health policy** due to its positive effects related to various **chronic diseases, mental and physical function and life quality**. The effects are greater if, in addition, there are established other **healthy habits**: Healthy diet (weight control, reduced consumption of animal fats and fast sugars, higher consumption of fruits and vegetables, etc.), no tobacco, no other drugs (without alcohol abuse), stress management, adequate sleep hours (an “ordinate” life), etc.

Objective health measures: Maximal Oxygen Consumption (Course-Navette) and Body Mass Index (BMI)

Table 2.

(Moreno, 2007)

Classification	IMC (kg/ m2)		
	Main values	**Additional values**	**Attributed values**
Underweight	**< 18.60**	**< 18.60**	
Severe	< 16.00	< 16.00	2
Moderate	16.00- 16.99	16.00- 16.99	4
Acceptable	17.00- 18.49	17.00- 18.49	6
Normal	18.50- 24.99	18.50- 22.99	7
		23.00- 24.99	7
Overweight	**>= 25.00**	**>= 25.00**	
Pre-obesity	25.00- 29.99	25.00- 27.49	6
		27.50- 29.99	5
Obesity	**>= 30.00**	**>= 30.00**	
Type I	30.00- 34.99	30.00- 32.49	4
		32.50- 34.99	4
Type II	35.00- 39.99	35.00- 37.49	3
		37.50- 39.99	2
Type III	>= 40.00	>= 40.00	1

The amount of Physical Activity may be obtained from a single session or by accumulation (over a number of days in series with a duration greater than or equal to 10 minutes). Daily and work activities, of moderate or high intensity and with a duration superior to 10 minutes should be considered as part of the duty of the prescribed Physical Activity (PA) program.

Muscular strength and endurance

- 8-10 exercises (the main muscle groups): exercises against the resistance and gymnastic exercises with own body weight (all degree of joint mobility);
- 8 to 12 repetitions (10-12 RM), third age and various pathologies 10 to 15 repetitions;
- 2 days or more/week (non consecutive).
- Flexibility exercises:
- 4 or more repetitions/stretching for each of the major muscle groups (especially the most rigid) to the point of discomfort;
- 2-3 or more days/week;
- Passive Techniques (maintaining 10-30 sec.) and active (6 sec. contraction + 10-30 sec. assisted stretching).

Aerobic activity

• **Option 1:**

- PA of moderate intensity (3-6 METs; 55-70 % FCmax);
- At least 30 min / day;
- Minimum 5 days / week.

• **Option 2**:

- PA of "vigorous" intensity (>6 METs; > 70% FCmax);
- At least 20 min / day;
- Minimum 3 days / week.

• **Option 3**:

Combination of **Option 1 + Option 2**.

Flexibility Exercises

• 4 or more repetitions/stretching for each of the major muscle groups (especially the most rigid) to the point of discomfort;

• 2-3 or more days / week;

• Passive Techniques (maintaining 10 to 30 sec.) and active (6 sec. contraction + 10-30 sec. assisted stretching), (ACSM/ AHA, 2010).

Conclusions

"Prevention education is the most powerful weapon which you can change **the health of the world."** Ronald E. LaPorte

Following the knowledge accumulated along the Erasmus program I have closely acknowledged the beneficial effects of the exercises in the aquatic environment on the physical and mental health of the practicing individuals.

I noticed that the practice of physical activities in natural environments is very attractive for any type of person, from the youngest to the eldest.

Also, the personal moral feelings were fulfilled by the satisfaction seen in the children with special needs that I have performed sportive activity in the aquatic environment.

In general, the benefits of systematic Physical Activity are

- It develops general and special motor skills, particular to the aquatic exercises
- It develops psychic abilities of self confidence but also in the aquatic environment

- It develops social and communication skills with other people from other cultural and social environments

- It improves the cardiovascular and respiratory capacity due to the influences exercised by the aquatic environment

- Mental relaxation occurs due to further oxygenation of the brain through physical exercise

- There are performed extensive movements in all joints, movements that on land cannot be achieved, improving greatly joint mobility.

- A very good control of body weight through fun and relaxing exercises.

- It produces general relaxation and a very good mental state for pregnant women.

As a result of practical experience and the information gathered I started a project to conduct aquatic sports activities with different categories of people in specific groups.

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THE DEVELOPMENT OF BASIC MOTORSKILLS THROUGH PLAYFUL ACTIVITIES IN CHILDREN WITH SPECIAL EDUCATIONAL NEEDS

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ABSTRACT. ***Introduction*.** A basic characteristic of people with special educational needs is the emergence of a certain state of instability, emotional imbalance, marginalization, or in more serious situations, a total break between individual and society**.** ***Objectives*.** The identification and selection of some motion games; the application of motion games in the development and improvement of motor skills; the evaluation of students' involvement in the proposed motion games. ***Material and methods*.** The research was carried out on a group of 4 students with special educational needs, students of the "School Center for Inclusive Education" from Cluj-Napoca and was held from October 2012 to June 2013. The methods used were: observation, interviews, analysis of documents and case study. After having reffered to different books and works specialized in this field, we identified and selected a number of 12 motion games. This is the material that formed the basis of the present study. ***Results*.** Each of the four students have evolved differently, because each of them have their own pace of development. ***Conclusions***. We arrived at the following conclusions: the improvement of the fundamental movements and postures of the body and of the various segments of the body of all the four students; the organization of movements in actions; the improvement of the motion skills by handling the object of the game, through the implementation of the necessary balance of technical processes and actions of the game.

Key words: special educational needs, motion games, motricity

REZUMAT. ***Dezvoltarea deprinderilor motrice de bază prin intermediul activităţilor ludice la copiii cu cerinţe educative speciale. Introducere.*** O caracteristică de bază a persoanelor cu cerinţe educative speciale, este apariţia unor stări de instabilitate, marginalizare, dezechilibru emoţional, sau în situaţii mai grave, ruperea totală a relaţiei individ-societate. ***Obiective.*** Identificarea şi selectarea unor jocuri de mişcare; aplicarea jocurilor de mişcare în vederea dezvoltării şi perfecţionării deprinderilor motrice de bază; evaluarea implicării elevilor în jocurile de mişcare propuse. ***Material şi metode.*** Cercetarea a fost realizată pe un

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grup de 4 elevi cu cerinţe educative speciale, elevi ai Centrului Şcolar pentru Educaţie Incluzivă, Cluj-Napoca şi s-a desfăşurat în perioada octombrie 2012 - iunie 2013. Metodele folosite au fost: observaţia, interviul, analiza documentelor şi studiul de caz. În urma consultării unor culegeri şi lucrări de specialitate, s-au identificat şi selectat un număr de 12 jocuri de mişcare, acestea constituind materialul care a stat la baza prezentei lucrări. ***Rezultate.*** Fiecare elev din cei patru, au evoluat diferit, deoarece fiecare dintre aceştia au un ritm propriu de dezvoltare. ***Concluzii***. Am constat următoarele: îmbunătăţirea poziţiilor şi a mişcărilor fundamentale ale corpului şi ale diferitelor segmente ale corpului la subiecţi; organizarea mişcărilor în acţiuni; formarea deprinderilor motrice, prin mânuirea obiectului de joc, prin echilibrul necesar execuţiei procedeelor tehnice şi a acţiunilor de joc.

Cuvinte cheie: cerinţe educative speciale, jocuri de mişcare, motricitate.

Introduction

The concept of "special educational needs" was released in 1978 in the UK, on the occasion of the Warnock Report, a document that has been the basis for the reforms of the special education in this country. Since 1995, the term was introduced in the Law of Education in Romania. Thus, this term refers to the educational program requirements for certain categories of students with disabilities and some categories that have difficulties in school.

A basic characteristic of people with special educational needs is the appearance of states of instability, marginalization, emotional imbalance, or in the worst cases, a total breakage of the individual-society relationship.

The category of children with special educational needs includes both children with disabilities and children without disabilities, but who have problems to adapt themselves to the demands of school.

The motion game, as a means of physical activity, represents a complex form of motion that, due to its characteristics of form, content and effects, is used since very early infancy. The many tasks of a moving game requires an ordering of the games based on some criteria: some related to the form of the game, others to the game content, others to the number of players or the season in which it is practiced. During the game, the child runs, jumps, crawls happily, climbs and his movements become more accurate. In the game, children overcome their shyness and timidity more easily and they develop their creativity and their self-esteem. The game also develops attention, memory, reasoning, a sense of responsibility, commitment to the team, spirit of discipline and order, it educates one's determination, honor and fairness.

Objectives

- identification and selection of motion games;
- application of motion games in order to develop and improve basic motor skills;
- assessment of students' involvement in the proposed motion games.

Materials and methods

The study group

The research was carried out on a group of 4 students with special educational needs, pupils of the „School Center for Inclusive Education", Cluj-Napoca and ran from October 2012 to June 2013. The group consists of three boys and one girl, aged between 15 and 16. One of the pupils in the group is cared for by social parents at "Spring" family house from Floresti and three others from the Institution for Child Protection No. 1 –the residential service for children with disabilities in Cluj-Napoca.

Table 1.

Presentation of the study group

Name	Age	Sex	Provenience	Medical data
I.A.	15 years old	male	institutionalized	hyperkinetic conduct disorder, weight deficit
I.Ş.	15 years old	male	institutionalized	hyperkinetic conduct disorder, weight deficit
L.R.E.	15 years old	female	institutionalized	hyperkinetic conduct disorder, spina bifida sacral
L.M.	16 years old	male	institutionalized	dorsal kyphosis

Research methods

The students' personal data were extracted from school records and interviews with the caregivers.

The methods that allowed us to collect data and information about subjects and subsequently to analyze and to organize our goals were: observation, interviews, document analysis and case study.

The motion games applied

After reading different specialized studies, we identified and selected a number of 12 motion games that constitute the material which formed the basis of this paper. The selected games were taken exactly as found in the

bibliographic sources or they were transformed or adapted to the specific needs and characteristics of students with special educational needs.

In the selection of the games we took into consideration the following criteria: the contents of the games that include basic motor skills (walking, running, jumping, throwing and catching), the physical possibilities of the subjects for their execution, affordability and understanding the text (content understanding and respecting rules of the game). The following are motion games used in this paper:

- **Specific motion games for walking:** "the footsteps", "the walking dwarf", "the tripping horse"

Fig. 1. – The game "the footsteps"

Fig. 2. – The game "the walking dwarf"

Fig. 3. – The game "the tripping horse"

- **Specific motion games for running:** "the race numbers", "the twins", "take your island"

Fig. 4. – The game "the race numbers"

Fig. 5. – The game "the twins"

Fig. 6. – The game "take your island"

- **Specific motion games for jumping:** "the decajump", "skip the line", "the string"

Fig. 7. – The game "the decajump"

Fig. 8. – The game "skip the line"

Fig. 9. – The game "the string"

- **Specific motion games for throwing and catching:** "the squirrel", "catch and throw", "the ball through the tunnel"

Fig. 10. – The game "the squirrel"

Fig. 11. – The game "catch and throw"

Fig. 12. – The game "the ball through the tunnel"

Results

The motor activities carried out with the selected group that included motion games were applied systematically throughout the school year. This was achieved by involving the students in some group activities and in activities such as one to one (teacher-student, student-student). Each of the four students has evolved differently because each of them has their own pace of development. However, the activities used differential treatment of the students, thus taking into account the particularities of each individual, with emphasis on those related to their psychomotricity.

We have to mention the purpose of our activities was not to achieve some sport performances among children, but we intended first of all to offer an alternative that would constitute a means of developing some motor skills and then to offer them the possibility to relax and to communicate with others in order to help them to integrate themselves more easily in a social environment. Therefore we followed the results obtained by each subject (level of development and improvement of driving skills) from one activity to another without comparing the subjects among them.

Case study no. 1

With regard to motor skills, the subject is moving through a messy walk inappropriately, showing imbalance while walking. Running up the stairs, alternating feet but less chaotically. Hits with the foot and the ball accurately, throws the ball to 1-2 m, but does not properly assess the trajectory and speed of the ball, does not appreciate the sight distance.

Case study no. 2

It shows limitations in the performance of motor actions. The control and the coordination of movements are relatively good, but there are difficulties in imitating, the movements rate is extremely slow, lazy. The children move forwards, inappropriately, they present balance while walking. They run up the stairs, alternating feet rather rambling. While throwing and catching an object coordination is wrong. They hit the ball with the foot and throw the ball accurately at 1-2 m.

Case study no. 3

He stands up, heels on the ground, but not in proper balance, he climbs stairs alternating feet, runs, jumps, still with both feet together. He hits the ball accurately, throws the ball at 1-2 m, he has control of his breathing.

He imitates some movements and he listens to verbal commands certain hand movements, he crumples a paper sheet; he unbuttons buttons and stitches; he picks up and throws objects with less precision for a particular purpose; he spins whirligig; he makes a circle with a pencil following the outline of a coin; he makes a ball from a string, he knocks the ball with the palm of the earth; he understands the meaning of gestures performed by others and he even follows the instructions; he loosens and blends assembled toys; he kneads the dough; he handles scissors and he cuts by a model but with less precision and he dresses themselves properly.

Case study no. 4

The pace while walking is slow, he walks on his knees because of the length step and his height. He climbs the stairs, alternating feet, he run randomly, he slightly kicks the ball with his foot. He does with lot of difficulty the activity of catching and throwing because of the lack of coordination and interest, he catches weaker than throws, he throws the ball at 1-2 m.

Carried out by imitation, some hand movements, crumples with one hand a piece of paper, folds paper, unbuttons buttons, stitches, picks up and throws objects with little accuracy for a particular purpose; whirligig spins, gathers string on the ball, makes a circle with a pencil outline of a coin designs copied increasingly complex, sews easily, has enhanced writing skills, unwraps and assembles toys, combines knead dough, uses scissors, cuts by model, dresses himself and correctly; turns the pages of a book one; holds a pencil in his hand.

Conclusions

By analyzing the motion games developed by the four subjects, we conclude the following: an improvement of the basic positions and movements of the body and different body segments in subjects; the awareness and the identification of different parts of the body, the body scheme representation, a mental representation of the actions; orientation organization and structuring of spatial and space-time, the perception of time and space in relation to itself; the organization of movements in actions; the training of the motor skills by handling the object of the game, the necessary balance execution of techniques and actions of the game.

Thus, after applying the motion games, the I.A. and I.S. subjects show visible progress in walking and running. If at the beginning of our experiment the body is rigid, their eyes are down and their chin on their chest, at the end the walking and running are balanced, their movements more organized, they have a correct posture, a body alignment and an increase of the stability. Because of the existing motor difficulties the subjects have difficulties in the execution of jumps, throws and catches; there is a lack of coordination in their bimanual and oculomanuale movements, in the orientation in space and in appreciating the shape and the speeds of the objects.

The subject LRE has a very good motricity and a fast pace and he fails to act easily during the games and to complete the task correctly and in time. An availability for the activities, the involvement and a constant attention, the level of the development of the motor skills, the capacity of adaptation and of self-confidence in his capacities are issues that, together, contribute to the further development of his independence, facilitating social integration.

Because of his motor limits at present, subject LM has difficulties in most of the games. During the game his pace movement is extremely slow and lazy, and if the teacher stimulates him, he performs the task in a hurry, without concentration, in a fast pace, giving the feeling that his desire is to escape from work. When walking he presents swings, incorrect posture with rounded back, the running on his knees, lack of precision in the jump movement, throwing and catching. From the social point of view he has a better interaction with others in the group, showing interest in initiating contacts with others.

In the end of our the study we can say that the motion games have proven their efficiency, our student registered visible progress in their the motor capacity and in their communication skills, confirming thus the objectives of the present study, that the involvement of children with special educative needs in activities that satisfy their need for moving, it facilitates the formation of skills and habits which lead to a harmonious development of the whole body, thus maintaining health.

Applied daily in the bodily activities of children with special educational needs, the motion games are considered by experts as important means of formative and educational factors. The participants in the game are learning the motion skills and they order their body movements, thus preparing themselves for work and life.

The activities that include movement games can be applied to other subjects, at any age if they have good results they can be diversified by increasing the complexity of the activities.

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A STUDY ON METHODS AND MEANS USED TO INCREASE THE INTENSITY PARAMETER TO A JUNIOR FOOTBALL GAME TEAM

SEPTIMIU ORMENIŞAN[1,*]

ABSTRACT. Today, the football game is characterized by a rich competitive activity, to which, in addition to domestic championship games, there are added the official and friendly matches and various other occasional competitions. If we consider that the current game, compared with the ones in the past, has become more dynamic, players are obliged to run continuously, performing many changes of pace, the battle has became more fierce and it requires a higher energy consumption; - there are needed both technical and tactical processes which are more improved and a more complex tactical thinking. All these can give us an overview of the many qualities needed to the valuable player and of the very high demands being placed on him, during a competitive year. In order for the football player to face such requests, he must possess a luggage of valuable physical qualities and a solid preparation, by means of which he can bear, in optimal conditions and without repercussions, the big and always growing efforts of the game.

Key words: football, dynamic, players, intensity, parameter.

REZUMAT. ***Importanţa pregătirii organizate a juniorilor rezultă din asigurarea unui proces instructiv-educativ care să corespundă la toate cerinţele ştiinţei antrenamentului.*** Aceasta presupune cunoaşterea particularităţilor biopsiho-sociale ale fiecărui junior pe trepte de vârstă, dar cu deosebire contradicţiile dintre aptitudini (genetice şi dobândite) şi dinamica personalităţii, cu implicaţii directe asupra conţinutului şi metodologiei pregătirii. Abordarea componentelor antrenamentului, metodologia folosită, dinamica parametrilor efortului cu valori proprii etapelor sau ciclurilor de pregătire, precum şi organizarea şi desfăşurarea unor lecţii de antrenament atrăgătoare, mobilizatoare, dinamice şi interesante, trebuie să fie adaptate strict la treptele de vârstă respective. Numai în aceste condiţii pot fi îndeplinite obiectivele intermediare şi finale de etapă sau treaptă de vârstă. Fotbalul dezvoltă la un înalt nivel spiritul de echipă şi facilitează ridicarea pe o treaptă superioară a unor calităţi psihice preţioase cum sunt: voinţa, perseverenta, spiritul de abnegaţie şi de sacrificiu, dârzenia, tenacitatea, gândirea combinativă, promovarea soluţiilor

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surpriza etc. Imensa varietate a situaţiilor şi problemelor solicită o mare capacitate de adaptare la dimensiunile şi condiţiile jocului, stăpânirea perfectă a elementelor de tehnică, o gândire tactică adecvată situaţiei create. Structura motrică a exerciţiilor este aciclică, caracterizată printr-o varietate de variante ale mişcărilor şi un efort diferit.

Cuvinte cheie: fotbal, dinamică, jucători, intensitate, parametru.

Introduction

The importance of organized training of the juniors results from providing an instructive-educational process which meets all the requirements of the science training. This requires the knowledge of bio-psycho-social particularities of each junior in age steps, but especially the contradictions between the skills (genetic and acquired) and dynamic of the personality, with direct implications on the content and the methodology of training.

Approaching the components of the training, used methodology, the dynamic of the parameters of effort with own values of stages or cycles of training, as well as organizing and developing various attractive training lessons, mobilizing, dynamic and interesting, there must be adapted strictly to the those age stages. Only under these conditions there can be fulfilled both intermediate and final objectives of stage or of age stage.

The football develops at a high level the team spirit and facilitates the raising on a superior level of precious psychical qualities such as: the determination, the perseverance, the spirit of dedication and sacrifice, willingness, tenacity, combined thinking, surprised solution, etc. The great variety of situations and problems requires a great capacity of adaption to both the dimensions and the conditions of the game, a perfect mastering of elements of technique, an adequate thinking tactic to the created situation. Propellant structure of the exercises is acyclic, characterized by various types of movements and a different effort.

Conceptualizing the intensity parameter

C. Bota and B. Prodescu-Anton (1997), studying the great diversity of physical efforts performed in everyday life, but especially in sports activity, highlight the possibility of their classification into several categories, in relation to certain criteria.

Thus, depending on the intensity of the effort, we observe the following types of the effort:

- ***Maximal intensity effort,*** lasting 10-15 seconds and it is characterized by the highest energy flow (the amount of energy released per unit time). Being questionable the duration of this effort, some give a smaller range 3-8 seconds (Zatiorschi). Energy is released anaerobically from the ATP.
- ***the effort of submaximal intensity***, lasting up to a minute. The release of energy is also done anaerobically
- ***High intensity effort***, lasting up to 6 minutes, with energy release both anaerobically and aerobically
- ***Moderate intensity effort***, lasting up to 60 minutes. The formation of energy is done aerobically in conditions of relative stable state. There is a certain balance between oxygen consumption and oxygen requirements. Yet, it recorded a small oxygen deficit, which will be covered after effort, by increased oxygen consumption. The energetic substrate is represented by the carbohydrate.
- ***Low intensity exercise***, lasting between 60 minutes and several hours, in which the forming of energy takes place aerobically. The entire necessity of the oxygen is covered by consumption, so it appears the true steady state (steady-state). The energetic substrate is represented by carbohydrates and lipids.

The intensity parameter, in most cases, is left at a free active movement level demanding, in the best case, the elastic function of the musculo-articular formations and not contractile function of the muscle, the only one which can provoke the intensification of the muscular metabolism which has as a base the trofic effects necessary to the developmenet of body muscle.

The intensity of the effort can be characterized as variable, going from the lowest and moderate up to submaximal and even maximal, than the player enjoys short but very useful and valuable breaks, for restoring the biologic potential which was sometimes jeopardize by exhaustion. Both football training and competitions demand intensely the musculoskeletal, nervous system, cardiovascular system of the footballers which, also, produce favorable morphological and functional changes. Through immediate changes of compensation, the footballers are capable to promptly get adapted and with great efficiency to more exigent requirement of the modern game, while the late changes (of training) aims the growth of the general biological potential of sportsmen, increasing the effort capacity and strengthening the health.

Both intensity and volume must be subordinated to obtaining complexity after which they also increase up to the limit of requirements, where there will be applied the development of skills, also propellant activities. In developing the force, the specific of the parameters of the effort consists of simultaneous priority of the volume and intensity.

The increase of intensity is based on accumulation produced from one stage to another, from one lesson cycle to another. The accumulation is produced on the basis of the volume. This is the reason why the volume must be correlated with the intensity. Very often this correlation is neglected in the sense that action is done with the same volume and intensity over long periods of time, using only the lifting procedures with the weight that is slowly increased and of the circuit limiting the isometric procedure. The first two procedures increase the muscle mass, but not the tonicity.

In sport medicine it is more and more required the ideea that in the case of both trained childrens and juniors, after the effort it is seen not only the change of heate rate, but also the adjustment of the volume of the beatting. It is seen in heart rate frequency at effort, where at equalt effort, the heart rate is smaller at those trained. Heart rate at effort is slightly raised at girls. (A. Demeter, 1981, 1982, 1983).

The most suitable age for developing the optimum physical capacity for effort is junior age. (A. Demeter, 1983).

Through an intense and systematic training for the general development that the footballers develop, the body answers to demand by an increase in heart rate due to distention of the heart, but the weight of the cord is increased at 16-17 years old. It was found that the circulatory system, as limited factor, plays an important role in the appreciation of the physical capacity at the juniors. By decreasing the heart rate and increasing blood pressure at effort, we get to a state where the circulatory system adapts easily to big efforts. (A. Dragnea, 1999).

The research was made at F.C. Universitatea Cluj, from Cluj-Napoca, during January 2012-June 2012 on a number of children born in 2000 and 2001 and I had as a support Mr. Sarmasan Ovidiu.

Methods

1. Bibliographical study;
2. Pedagogical observation;
3. Consultation, analysis and interpretation of planning documents;
4. Recording and data processing:
   - Personal data and morphological indices
   - Functional indices (F.R., F.C., T.A);
   - Indices of checking norms;
   - Correlation on lesson cycles of effort parameter;
   - Graphical representation of the dynamics of the parameters of effort.

Regarding the dynamics of the parameters of effort, it appears through volume in annual planning and through volume and intensity in the stages plans. I can say that especially in the stage plan it appears a structuring of the parameters of effort and after testing functional indices during preparation to conclude to what extend the coach managed to relate to these parameters.

System testing and gathering data in order to obtain physiological indics necessary to the final analyze

Pedagogical observation and testing were made during the development of the experiment. Thus, I retained the personal data and morphologic indices, and in addition I made several tests in order to obtain the physiological indices necessary to the final analyze. With these findings, tests and information I have analyzed separately and after that in general the evolution of the instructive-educative process reported to the aimed objectives from the perspective of the way the dynamic of parameters of intensity of effort had or not a positive influence.

Table 1.

Searched subjects – antropometric measurements

	Name and surname	The year of birth	Waist cm)	Weight	T-100 gr.
1.	S. C.	2000	147	31	1,52
2.	B. E.	2000	142	39	1,08
3.	T. B.	2001	135	26	1,35
4.	R. F.	2000	138	28,5	1,33
5.	C. P.	2000	138	25,5	1,49
6.	L. A.	2001	149	35,5	1,38
7.	C. P.	2000	149	38	1,29
8.	D. M.	2000	149	29	1,24
9.	R. I.	2001	149	33,5	1,37
10.	U. M.	2000	144	32	1,37
11.	M. R.	2000	136	37,5	1,78
12.	S. F.	2001	136	30	1,20
13.	V. P.	2000	136	27	1,33
14.	N. B.	2000	150	36,5	1,37
15.	S. D.	2000	135	27,5	1,27
16.	M. M.	2000	148	36	1,33
17.	C. D.	2000	149	34	1,44
18.	S. I.	2000	151	33,5	1,52
19.	M. L	2000	147	33	1,42
20.	A. G.	2000	141	27,3	1,49

Table 2.

Testing results of propellent qualities (initial and final)

Nr. Crt.	30m start standing		Jumping. long, from a fix point		Dribbling in straight line of 30m		Dribling in triangle 2x		Shot at gate		600 m
	T.I	T.F	T.I	T.F	T.I	T.F	T.I	T.F	T.I	T.F	T.F
1.	5,2	5,0	150	165	6,7	5,8	17	16,8	14	16	2,29
2.	6	5,2	142	155	7	5,9	17,9	16,9	16	19	2,45
3.	6,1	5,3	150	160	7,8	6,9	17,9	17,1	12	16	2,36
4.	5,8	5,5	145	155	7,2	6,2	17,8	15,4	11	16	3,05
5.	5,6	5,2	155	165	6,8	5,9	17,6	16,8	11	16	2,37
6.	5,9	5,5	150	155	4,7	6,6	19,3	18,5	10	15	2,54
7.	5,6	5,4	160	165	7,9	6,1	17,1	16,8	13	16	2,46
8.	5,8	5,7	150	160	7,3	6,3	18,8	18,0	12	15	2,48
9.	5,6	5,4	145	160	7	6,7	17,3	16,9	11,5	16	2,45
10.	5,8	5,5	140	155	7,9	6,9	20,1	16,3	12	17	2,47
11.	5,9	5,3	150	160	8,1	6,3	17,9	17,3	10	16	2,32
12.	6,1	5,6	140	140	9,2	7,5	18,1	19,2	11	15	2,30
13.	5,6	5,3	150	160	7,2	6,0	17,8	17,1	11	15	2,40
14.	5,2	5,1	160	165	6,8	5,9	17,1	16,4	11	16	2,40
15.	6,1	5,2	150	165	7,6	6,8	17,6	16,5	12	17	2,42
16.	5,3	5,0	175	185	6	5,6	16,2	16,2	14	20	2,05
17.	5,3	5,1	165	170	6,9	5,8	16,4	15,1	12	19	2,28
18.	6	5,5	140	150	8	6,3	19,5	18,2	13	16	2,38
19.	5,7	5,1	160	170	6,6	6,1	17	16,1	14	16	2,32
20.	5,9	5,6	150	165	7,5	6,8	15,9	15,3	12	15	2,36

Table 3.

The results of the functional indics

Nr.	Cardiac frequency		Breathing freaquency		Blood pressure		Chest area		Dif
Crt	T.I	T.F	T.I	T.F	MAX	MIN	INSP	EXP	
1.	76	75	19	19	120	60	73	65	8
2.	72	70	20	19	135	70	78	72	6
3.	78	77	19	18	130	65	75	66	9
4.	76	75	21	21	135	70	75	65	10

Nr.	Cardiac frequency		Breathing freaquency		Blood pressure		Chest area		Dif
Crt	T.I	T.F	T.I	T.F	MAX	MIN	INSP	EXP	
5.	72	72	20	19	125	60	70	65	5
6.	72	73	20	20	125	70	70	62	8
7.	74	71	21	20	135	65	71	61	10
8.	80	78	21	20	125	70	76	65	11
9.	72	70	19	18	120	65	68	60	8
10.	74	71	20	19	135	75	70	60	10
11.	76	72	20	20	130	60	69	66	3
12.	76	71	19	17	130	70	70	62	8
13.	74	73	20	19	130	75	70	61	9
14.	76	75	19	19	130	65	76	66	10
15.	72	72	21	20	135	70	70	65	5
16.	76	76	20	19	120	65	73	65	8
17.	74	73	19	17	135	60	66	60	6
18.	75	72	20	18	130	70	71	63	8
19.	78	75	20	19	125	65	80	72	8
20.	72	71	19	19	120	60	75	67	8

The analyze and interpretation of data to the tests regarding driving qualities

With the help of the samples and of the checking figures there were analyzed the following aspects of the process of both selection and preparation.

1. Checking the level from which the sportsmen enters the preparation process, of perspective;
2. Planning the process of preparation due to the knowledge of the evolution of those concerned;
3. Organizing training process by grouping those with appropriate possibilities into groups with same value.
4. Making a faire composition of the training units due to a precise establishment of the poor components
5. Checking the quality of the training according to the measure the sportsmen has reached the fixed parameters, the results of the training session being the base of future training plan.
6. Checking tactical knowledge and the ability to use them.

Both the samples and the checking standards used, were a combination between those of general testing and those specific to the football game.

Table 4.

Initial, intermediate and final testing, the results and the difference of the grades

	Running 30 m with standing start	Jumping in length from fix point	Dribbling in straight line	Shot at gate	Moving forward in triangle	600 Meters
T1	5,6	154	6,7	12,27	17,6	-
T2	5,4	157	6,4	13,44	-	-
T3	5,3	163,9	6,1	16,42	16,8	2,45
T3-T1	0,3	9,9	0,6	4,15	0,8	-

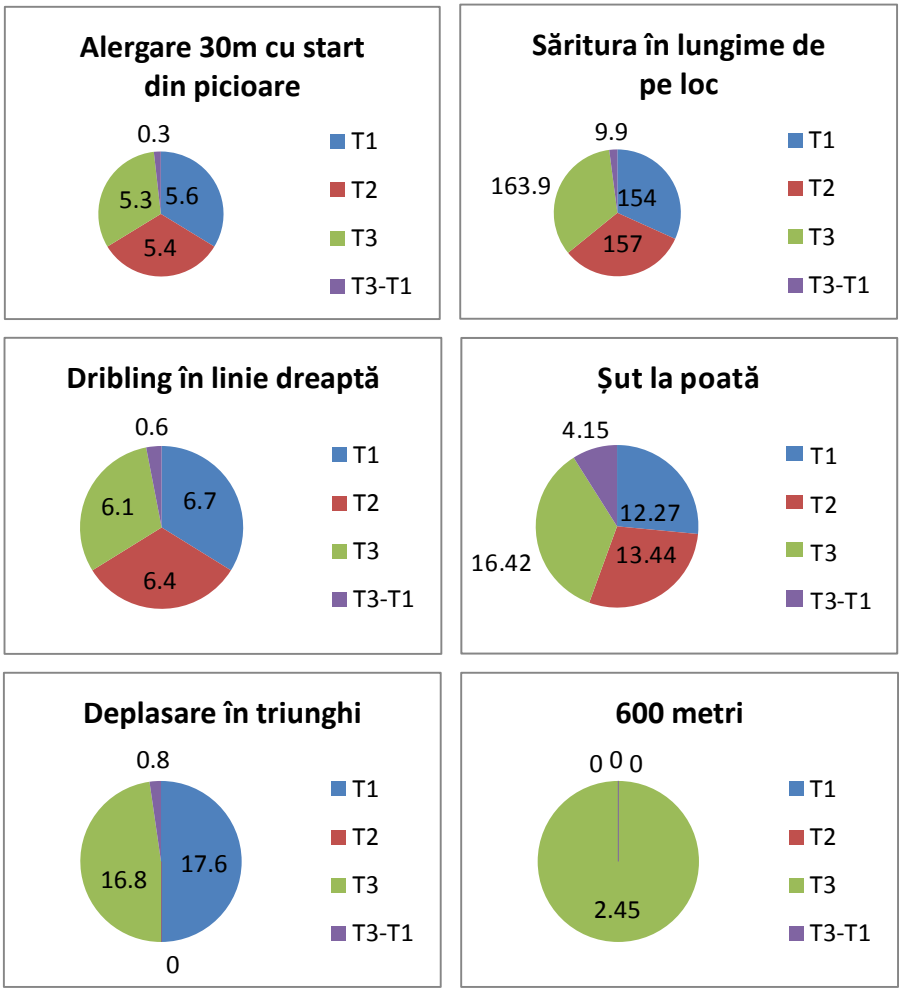

Figure 1. – Initial, intermediate and final testing & the progress achieved at propellent tests

Analysis and interpretation of the physiological test battery data

I would like to mention that we only used the indices of heart rate, because it seemed to be the most objective and most easily to verify in the training sessions.

The recordings in different moments of the training analyzed with the values got at the beginning and at the end, offered me the possibility to evaluate more precisely children's' effort capacity as well as their willingness.

Table 5.

The results of F.C. on the three phases of the experiment

Nr. Crt.	F.C. in the first phase		F.C. in the second phase		F.C. in the third phase		F.C. in bilateral games	
	before the training	after the training	before the training	after the training	before the training	after the training	before the game	after the game
1.	76	120	76	126	75	138	75	150
2.	72	114	72	120	70	126	71	138
3.	78	114	78	126	77	132	77	152
4.	76	114	75	120	75	120	75	150
5.	72	114	72	114	72	120	72	144
6.	72	114	73	114	73	126	73	147
7.	74	120	74	120	71	120	71	138
8.	80	126	80	126	78	132	78	159
9.	72	114	72	114	70	126	71	138
10.	74	126	73	120	71	120	71	144
11.	76	120	76	126	72	126	72	138
12.	76	120	76	132	71	126	71	138
13	74	114	74	120	73	126	73	150
14.	76	126	75	126	75	132	75	153
15.	76	114	72	114	72	120	72	153
16.	74	114	76	126	76	132	76	156
17.	74	114	74	120	73	126	73	150
18.	75	120	75	126	72	120	72	150
19.	78	126	78	132	75	138	75	156
20.	72	114	72	114	71	126	71	156
-	-	$\overline{X}$ =118	-	$\overline{X}$ =121,8	-	-	-	$\overline{X}$ =148,2

These values have helped me to determine the intensity, especially the exercise and the training lesson in general. Depending on the working volume (actual time) we could establish a certain level of the dynamics of effort intensity parameter, thing shown in the graphs attached to summary sheets.

Conclusions

1. The intensity is the most important indicator of programming sport training, because it expresses the volume of the effort done, with maximum efficiency, a certain period of time, within a training lesson, while the volume and the duration of effort represents its quantitative side, the intensity shows the qualitative aspects of effort dosage.

2. There is a correlative relation between the increase of the intensity of effort and the increase of O_2, because energetic price, O_2 consumption paid for an intensification of effort is almost the same for all subjects regardless of age, level of training, because the muscle fiber yield too little to individual particularities.

3. The intensity of the effort in a training must be strictly individualized, because the intensity of the demand at the same effort, differs from one subject to another and even at the same sportsmen, from one lesson to another, according to the level of training and fatigue momentary state.

4. Values between 160-180 p/m represents the limit of demand compatible with making the effort in conditions of aerobiosis (apparent stabile state) (steady-state) and it correspond to a concentration of 4 nmol/l of the level of lactate in the blood.

5. The recordings in different moments of the training related to the values that were at the beginning and at the end, offered me the possibility of a more accurate evaluation of the capacity of effort of children as well as their availability.

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BIOMECANIC CLASSIFICATION OF NAGE-WAZA THROWING TECHNIQUES (I)

IOAN-NELU POP[1,*], LEON GOMBOS[1], COSMIN PRODEA[2]

ABSTRACT. JUDO NAGE-WAZA techniques have been developed during the years based on the principle of making maximum use of certain physical conditions of space and time during one session. The issue of classification of JUDO techniques in general, and of NAGE-WAZA techniques in particular, arises out of two didactic considerations: grouping techniques according to logical criteria, in order to facilitate an easier understanding and systematic study; grouping techniques in an appropriate sequential structure in order to allow a gradual learning by beginners, with the result of mastering JUDO as a whole. In our paper "Foundation of the biomechanics of NAGE-WAZA standing throwing techniques" we aim at tackling the classification of JUDO techniques from the viewpoint of the mechanisms the execution of the NAGE-WAZA techniques are based on.

Keywords: judo, biomecanic classification.

REZUMAT. ***Clasificarea biomecanică a tehnicilor de proiectare din picioare Nage-Waza.*** Practicile din JUDO NAGE-WAZA au fost dezvoltate în cursul anilor în baza principiului de utilizări la maxim a anumitor condiţii fizice spaţiale şi de timp în cursul unei întâlniri. Problema clasificării tehnicilor de JUDO în cazul specific, cele de Nage-Waza se naşte din două considerente didactice.: gruparea procedurilor tehnice după unele criterii logice, pentru a ne permite o mai uşoară înţelegere şi un studiu sistematic; gruparea procedurilor tehnice într-o structură secvenţială adecvată pentru a permite o învăţare graduală de către începători, ca în cele din urmă să stăpânească JUDO în totalitatea sa. În lucrarea noastră „Fundamentarea biomecanicii procedeelor de proiectare din picioare NAGE-WAZA" încercăm o abordare a clasificării procedurilor de JUDO din punct de vedere a mecanismelor care stau la baza execuţiei unui procedeu tehnic de NAGE-WAZA.

Cuvinte Cheie: Judo, Clasificare Biomecanica.

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JUDO NAGE-WAZA techniques have been developed during the years based on the principle of making maximum use of certain physical conditions of space and time during one session.

Using a throwing technique during a competition depends on favorable opportunities or transitory circumstances, which occur at a certain point during competition and on competitive abilities, the capacity to know how to exploit for your own gain these opportunities which appear during competition.

This capacity to be able to exploit situations during competition is the result of correctly invoking constant practice, of research and of deepening skills. The issue of classification of JUDO techniques in general, and of NAGE-WAZA techniques in particular, arises out of two didactic considerations:

a) Grouping techniques according to logical criteria, in order to facilitate an easier understanding and systematic study;
b) Grouping techniques in an appropriate sequential structure in order to allow a gradual learning by beginners, with the result of mastering JUDO as a whole.

J. Kano was the first to turn to the two didactic considerations: the classification of techniques and the method of learning. This elaboration started in 1885 until 1992 and then until 1982.

Once JUDO evolved and entered the USA and Europe many European authors or Japanese experts tried to elaborate a variety of classification and teaching versions.

In our paper "Foundation of the biomechanics of NAGE-WAZA standing throwing techniques" we aim at tackling the classification of JUDO techniques from the viewpoint of the mechanisms the execution of the NAGE-WAZA techniques are based on.

At the first glimpse all throwing techniques can seem different as regarding their form, but a scientific analysis reveals that every throwing technique is a combination of general and particular characteristics.

General characteristics are those main actions, which can be found in a large number of techniques, while particular characteristics stop at data level. A bio-mechanic analysis of throwing techniques cannot ignore the problem of rational classification for successive stages:

a) Simplification first
b) Generalization and elevating to a principle for all throwing categories

For the principle of simplification of the force class problem, which we are dealing with, the KANO differentiating model will be used, i.e. the subdivision of the throwing motion in three stages.

TUKURI - all preparatory movements, meant to prepare the loss of balance of UKE and the positioning of the body of TORI for the throwing. KUZUSHI – the action of the balance loss forces and the direction and final orientation. KAKE – final execution of the movement in order to perform the

throwing and UKE analysis, by simplifying the secondary forces, then moving towards generalizing the categories of forces the KAKE phase is subject to. This method used by Attilio Sacripanti in his paper "Biomecanica del JUDO" allowed that the throwing techniques be grouped from a bio-mechanical point of view in two groups based on two execution mechanisms of the technical procedures:

a) Techniques where TORI uses a FORCE COUPLE in order to throw UKE
b) Techniques where TORI uses the force moment (lever) in order to throw UKE

The classification of the NAGE-WAZA throwing techniques based on the force couple and lever principle is the classification based on scientific support, which analyses the directions of the forces, static analysis, and the pathway of UKE's body during the throwing phase (flying phase), dynamic analysis, as well as the symmetries of the bio-dynamic group of the athlete couple TORI and UKE.

Static analysis (principle of decomposing of forces)

The static analysis shows the directional problem of the static use of forces, which occur during the performance of a technique. In order to make things easier the force which affects the performance of the technique is analyzed in two planes: horizontal and vertical. The following problems are analyzed:

a) Loss of balance – KUZUSHI – ȚUKURI
b) Launching – THROWING – KAKE

a) Loss of balance – KUZUSHI – ȚUKURI

During the ȚUKURI– KUZUSHI phase the forces are efficient and can be applied horizontally in a 360° angle. This conclusion unifies the bio-mechanic problem of the forces which affect rectilinear, as well as rotational during the ȚUKURI and the KUZUSHI phase.

b) Launching – THROWING – KAKE

The forces are efficient and can be applied in the vertical plane for a range of 90°. In this statement the resulting force of all forces occurring during the throwing phase – KAKE phase – is taken into consideration.

Dynamic analysis (principle of composing of forces)

The solution of the problem of dynamic forces shows the direction variation of forces in time, with the help of studying the trajectory of UKE's body and the property of feeling the trajectory.

Two coverage classes from the point of view of the trajectory are defined for UKE's body during the throwing phase in the case of throwing from a standing position.

a) Circular trajectory, spherical symmetry
b) Spiral trajectory, cylindrical symmetry

a) Circular trajectory, spherical symmetry

For throwing techniques where UKE's body or center of gravity shows a circular trajectory, the radius of the arch on which UKE's body rotates coincides with the radius R of UKE's insertion moment.

Techniques with spherical symmetry also have the trajectory with the smallest mechanical work, resulting in less energy consumption for TORI.

Figure 1 shows circular and spherical symmetric trajectory.

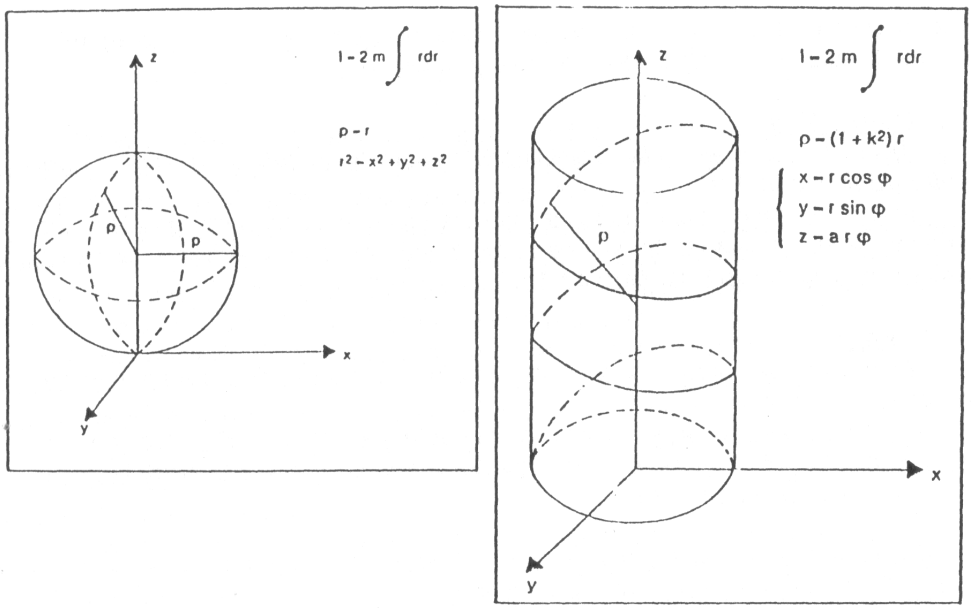


Fig. 1. Circular and spherical symmetric trajectory.

b) Spiral trajectory, cylindrical symmetry

With the throwing techniques, where UKE´s body describes a spiral trajectory (screw movement), the radius of the movement of UKE's body is directly proportional to the radius R of the rotation axis of the inertia moment.

The techniques have a cylindrical symmetry and the propeller, according to which UKE's body moves is the trajectory of a minimum mechanical work, thus with minimum energy consumption.

In the next paragraph we will show a static and dynamic analysis of the two classifications from a bio-mechanic point of view.

1) Techniques where TORI uses FORCE COUPLE to throw UKE.
2) Techniques where TORI uses PHYSICAL LEVER to throw UKE.

Types of throws according to the bio-mechanical classification

Static Analysis of Throws

The static analysis of throws is conducted according to the two classifications:

1) Performing the throw using FORCE COUPLE
2) Performing the throw using VARIABLE PHYSICAL LEVER

Performing the throw using FORCE COUPLE

In figure 2 the way of applying forces as force couples, as well as the static work conditions are presented.

Static conditions: a) loss of balance angle 360°
b) throwing angle 90°

In figure 2 the loss of balance angle and the throwing angle are presented.

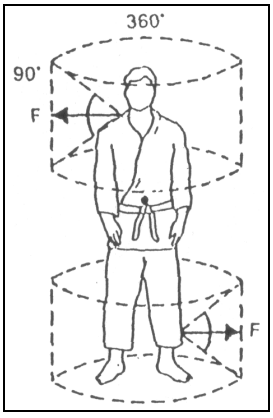


Fig.2. The loss of balance angle and the throwing angle

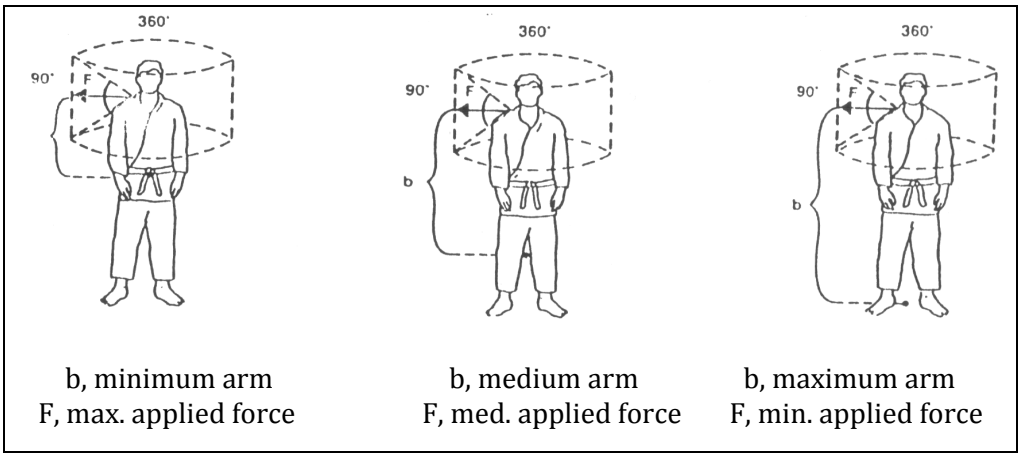
Performing the throw using VARIABLE PHYSICAL LEVER

Static conditions: a) loss of balance angle 360°
b) throwing angle 90°

In the case of throwing by using variable physical lever we will analyze three situations:

1) Minimum arm – maximum applied force
2) Medium arm – medium applied force
3) Maximum arm – minimum applied force

In figure 3 the three variants with the area where the force is applied and the length of the arm are presented.



b, minimum arm
F, max. applied force

b, medium arm
F, med. applied force

b, maximum arm
F, min. applied force

Fig. 3. The three variants with the area where the force is applied and the length of the arm

Dynamic Analysis of standing throws (Nage-Waza)

The dynamic analysis of standing throws consists of applying static and dynamic characteristics, which occur during the throwing phase of UKE. The analysis is conducted for the two cases of bio-mechanical classification:

a) Performing the throw of UKE using FORCE COUPLE
b) Performing the throw of UKE using PHYSICAL LEVERS

Performing the throw by applying FORCE COUPLE

The dynamic analysis consists of presenting the characteristics of loss of balance, the throwing angle, the trajectories and the perception of the throwing.

In figure 4 these characteristics are presented

STATIC CHARACTERISTICS
Angle of loss of balance - 360°
Throwing angle - 90°

DYNAMIC CHARACTERISTICS
CIRCULAR TRAJECTORY
SPHERIC SYMMETRY

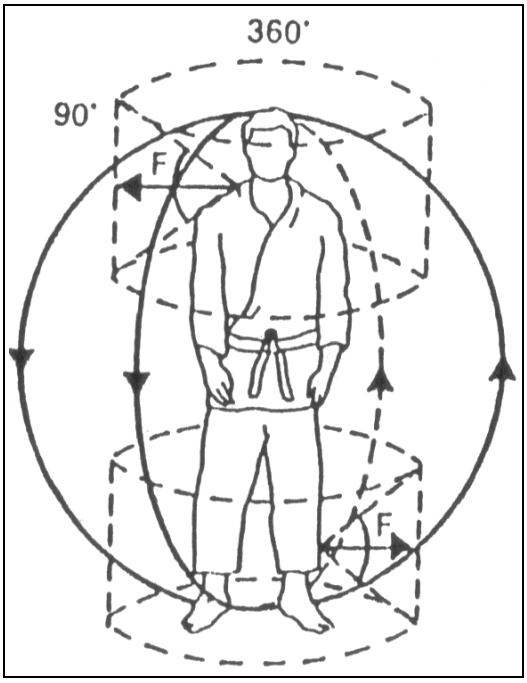


Fig. 4 . Static characteristics and dynamic characteristics

Performing the throw by applying a PHYSICAL LEVER with variable arm

From a dynamic point of view in the case of the physical lever both the static and the dynamic characteristics in the throwing phase of UKE are analyzed.

In the case of the physical lever three situations are analyzed:

a) Minimum arm – maximum applied force
b) Medium arm – medium applied force
c) Maximum arm – minimum applied force

STATIC CHARACTERISTICS
Loss of balance angle - 360°

DYNAMIC CHARACTERISTICS
Trajectories: circular, spiral
Symmetry: spherical, cylindrical

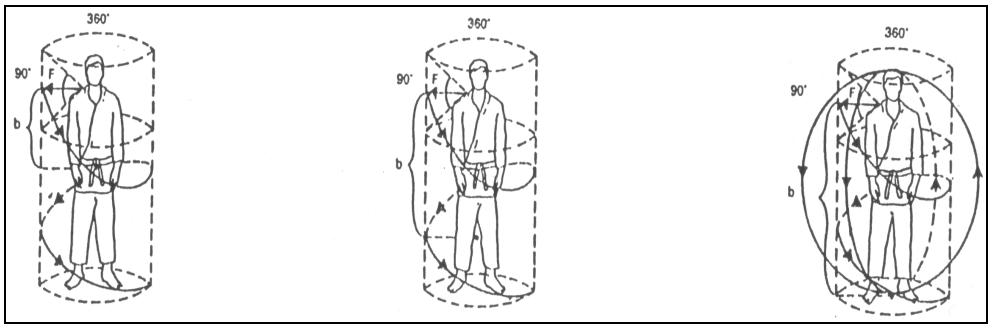


Fig. 5. Minimum arm – Medium arm – Maximum arm

Fundamentals of the FORCE COUPLE group

Explaining the entire scientific data base led to the classification of all NAGE-WAZA throwing techniques in two groups:

a) Applying a FORCE COUPLE
b) Applying a PHYSICAL LEVER WITH VARIABLE ARM

We will attempt to analyze the physical principle, the symmetries, the kinetics of throwing, the energy consumption, the muscles used from a bio-mechanic point of view.

This classification, originally performed by Attilio Sacripanti, is based on explicit scientific principles, and explains physical mechanisms JUDO throwing techniques are based on.

This bio-mechanical classification analyzes all throwing which are integrated in the KODOKAN classification from the point of view of the two mechanisms: FORCE COUPLE and PHYSICAL LEVER.

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STUDY ON USING PRESSING IN MODERN FOOTBALL GAME

SEPTIMIU ORMENIŞAN[1,*]

ABSTRACT. According to some references in the press and literature, and various briefings and discussions with some of the technicians and specialists of Romanian football, result that pressing, this means tactical football game was borrowed and adapted from basketball to football, under exclusive form of active defense and aggressive, the third field of the opponent. Unlike other games, in football, pressing involves a considerable effort, because the scale of land and largest opportunities of player with the ball to move and meneuver it. To get in touch with the player who has possession of the ball must travel distances and spaces bigger than basketball or Handball (Miu, S., Velea, F., 2002, p 134). The purpose of this study is to show that: pressing is useful and necessary not only in the game of the big teams but also in the game of lower teams, it should become a core component of tactical training at this level; pressing is a tactic that requires more and more in modern football beeing necessary to know the role its and applicability in the modern game of football. The hypothesis of the study: applying pressing in the preparatory lessons weekly cycle it could lead to an increase in its effectiveness in official matches.

Keywords: football, game, tactical means, pressing, opponent, attack.

REZUMAT. ***Studiu privind utilizarea presingului în jocul modern de fotbal.*** În conformitate cu unele referiri apărute în presă şi în literatură de specialitate, precum şi din diferite informări sau discuţii purtate cu unii dintre tehnicienii şi specialiştii români în fotbal, rezultă că *presingul, acest mijloc tactic al jocului de fotbal*, a fost împrumutat şi adaptat la fotbal din jocul de baschet, sub forma exclusivă de apărare activă şi agresivă, în treimea de teren a adversarului. Spre deosebire de alte jocuri, la fotbal, pressingul presupune un efort considerabil, datorită dimensiunilor terenului şi posibilităţilor mai mari ale jucătorului cu mingea de a se deplasa şi de a menevra mingea. Pentru a intra în contact cu jucătorul ce are posesia mingii trebuie parcurse distanţe şi spaţii mult mai mari decât la baschet sau hadbal (Miu, Ş., Velea, F., 2002, p. 134).

Cuvinte cheie: fotbal, joc, presing, adversar, atac.

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Introduction

Currently coaches give great importance during the training to both fundamental phases of the game: attack and defense. For success of these fundamental phases depends value and team results.

In football, pressing is the situation where the opponent has possession and defending team players put pressure on the player or his teammates, to recover the lost ball or to slow the game, or to force the opponent to make mistakes or to heavily handle the ball and with fear of being dispossessed (Miu, rev., sails, F., 2002, p 134).

Also by pressing it is aimed to limit time and space to transmit the ball, not obtaining a favorable position to shoot and imprecise pass to teammates.

Special request, from a psycho - physical point of view, require multilateral training forces, of which we mention a higher exercise capacity with high speed endurance, various possibilities of dispossession, determination and speed in all actions, intelligence and anticipation, knowledge and tasks achievements specific to different areas of the game (Neţa, Gh., Popovici, C., Ormenişan, S., 2000).

Sometimes the opponent in possession is attacked simultaneously by several players, other players providing coverage area in the vicinity of the ball. This tactic requires a lot of work from defenders moving to the middle to ensure a close cooperation with other players. Actions synchronization of all players is the success of this method in which correct ball dispossession plays an important role (Cernăianu, C., 2001).

The strongest teams in the world: Spain, Germany, Brazil, Argentina, France, England, the great team clubs, assign great importance to defending both individual and collective, which resulted in their famous internationally record.

Pressing has advantages if it is well done by the most of the players in the area, but can also be a disadvantage if opponents escapes and has extra players to be capitalized. Pressing is recommended to be done by strikers in the opponent's half, because, if successful, can trigger fast attacks, dangerous and even easier to score, beings around the opponents goal (Miu, Ş., Velea, F., 2002).

Materials and methods

The research was conducted during the Third League Football Championship 2011-2012.

This research had two stages:

- The first phase took place in championship realizing 10 recording sheets for a total of 8 players monitored at home matches of "Sanatatea" Cluj, located in Third League.

- A second phase took place in the second leg of football championship, applying questionnaires to technicians.

For the present study subjects were in the first phase the 18 components of "Sanatatea" Cluj football team and their opponents during the championship games. For the second phase we randomly selected a total of 20 coaches from various levels which we applied a questionnaire with closed questions.

Research methods

Observation method

Because the observation method, it was possible to conduct the registration process, and record the findings in the championship game.

There was the possibility of registering and recording the way in which they presented in terms of quantity and quality observed.

Examination was applied on the training process in order to qualify and quantify structural elements, components of training content. Because observation is a method of scientific knowledge of reality, the data obtained were rational processed.

Survey method

We called this method taking into account the fact that the survey is used mainly for harvesting opinions of individuals. The choice of this method was given by the need to fill data and especially for understanding subjective factors concealed by other methods.

For the investigation we used questionnaire through which we have come into possession of objective facts related to the research subjects, but also subjective facts, opinions and motives of the head of the preparation process.

Call and conversation method with coaches and players

Through the specialization that I have, often frequenting the circles of athletes and coaches at various levels I tried using this method to obtain other information than that provided by the game itself as well as questionnaires.

Statistical and mathematical methods

Some elements value of content preparation in training, the need for data processing in terms of statistical and mathematical made this method a necessity.

Through statistical and mathematical processing of the data acquired from research, precision is achieved in drawing conclusions, precision that leads to ease its use. With this method it was possible to create tables and various statistical indicators and illustrate the obtained results from the processing and interpretation of data. More correctly, this method was used to give meaning to research results.

Below are presented and analyzed some observation forms (a total of 3 of the total of 10) and their analysis:

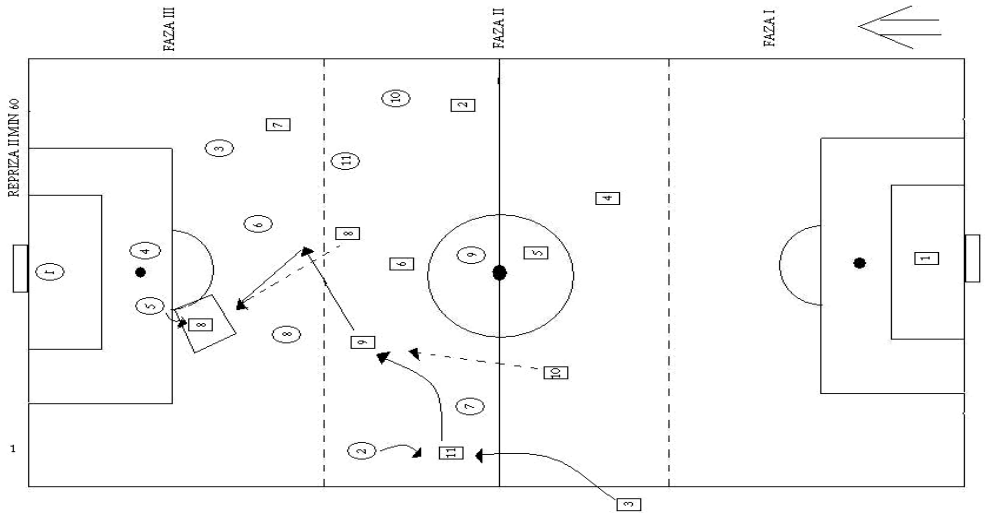

Figure 1. Pressing in zone 1 of defence

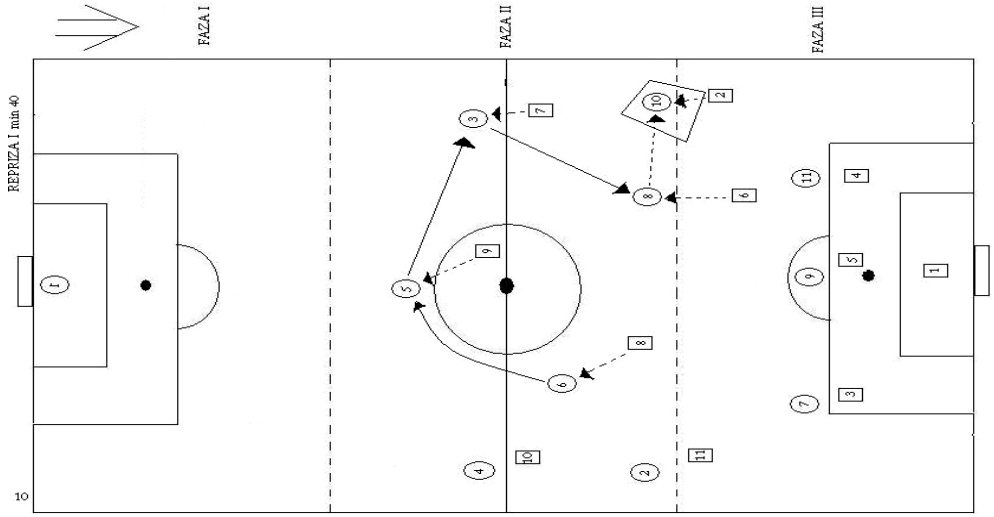

Figure 2. Pressing in zone 2 of defence

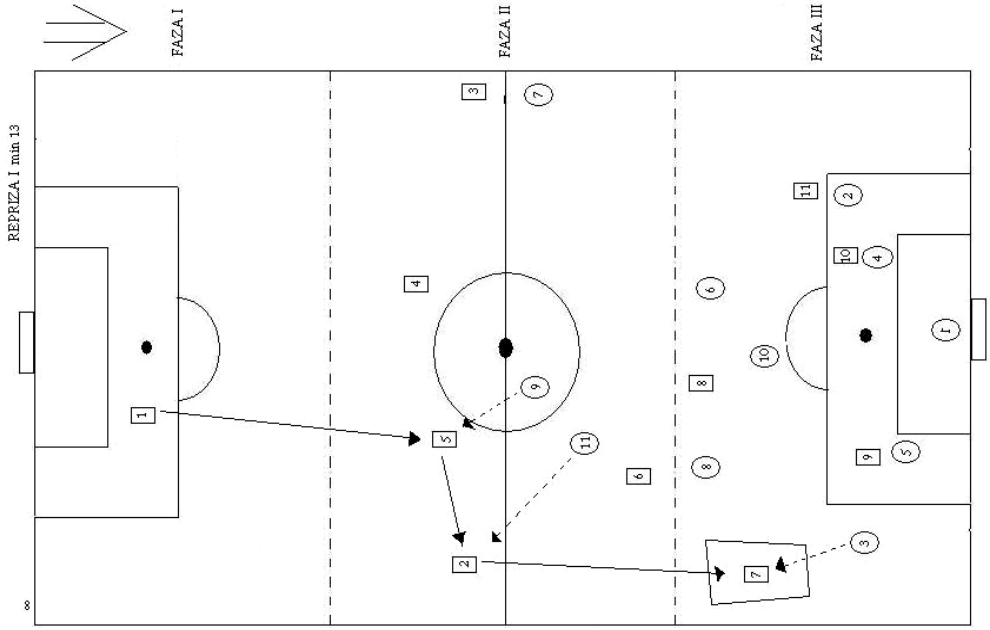

Figure 3. Pressing in zone 3 of defence

Results and Discussions

From the study of the record sheets the following important aspects regarding the application of pressure are:

1) A first way to apply pressing is given by its execution in the completion (of the gate side).

2) A second way to apply of pressure is given by its application in the construction area (half of the field).

3) Another way to apply pressure is in the first zone (third own land). Pressing in this area begins with the opposition in the attack near the dangerous zone of their own gate, where they can score, or to shoot at the goal. In this area, any mistakes defenders can not be recovered than successful intervention keeper or inaccuracies opposing forward.

Table 1.

Pressing efficiency's in the 10 matches observed

Registration number	Pressing efficiency			
	Correct	Incorrect	Partially correct	Correct at completion
1		Incorrect		
2	Correct			
3	Correct			
4			Partially correct	
5	Correct			
6	Correct			
7				Correct at completion
8				Correct at completion
9				Correct at completion
10	Correct			
TOTAL	5	1	1	3

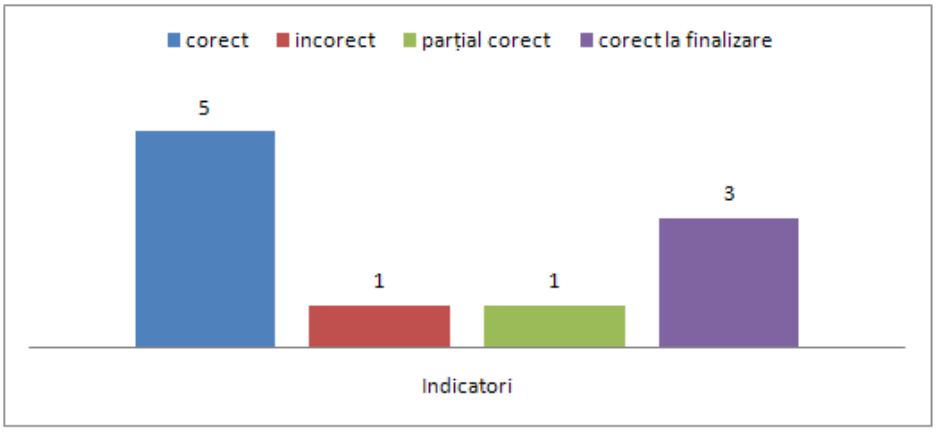

Figure 4. Graphical representation regarding pressing efficiency.

Table 2.

Presentation and analysis of results from the questionnaire on the 20 coaches. Because the questionnaire I applied I used questions with closed answers (yes, no, maybe), I will present its analysis on each question and the graphical representation of these questions.

Questions	***YES, NO, MAYBE***	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**TOTAL**
Is today's pressing a key feature in football?	***YES***	YES			YES		YES	YES	YES			YES				YES	YES	YES		YES	YES	11
	NO		NO	NO		NO					NO				NO				NO			6
	MAYBE									MAYBE			MAYBE	MAYBE								3
Pressing is a permanent tactical "weapon" used in the game?	***YES***	YES		YES				YES				YES					YES			YES	YES	7
	NO		NO		NO	NO	NO		NO		NO				NO			NO	NO			9
	MAYBE									MAYBE			MAYBE	MAYBE		MAYBE						4
Do you encounter difficulties at the team you train?	***YES***	YES		YES				YES		YES		YES		YES		YES	YES			YES	YES	10
	NO		NO		NO	NO	NO		NO		NO		NO		NO			NO	NO			10
	MAYBE																					0
Tactical thinking is crucial in the application of pressing in modern	***YES***	YES	YES		YES		YES	YES		YES	YES	YES	YES	YES	YES	YES		YES		YES	YES	15
	NO			NO					NO								NO		NO			4

Questions	YES, NO, MAYBE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	TOTAL
football?	MAYBE					MAYBE																1
Psychological preparation is crucial in the current football?	YES	YES	YES		YES						YES		YES	YES	YES	YES		YES		YES	YES	11
	NO			NO			NO	NO	NO	NO							NO		NO			7
	MAYBE					MAYBE						MAYBE										2

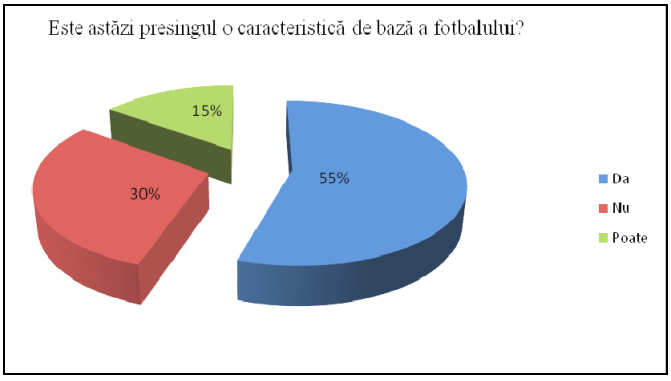

Figure 5. Is today's pressing a key feature in football?

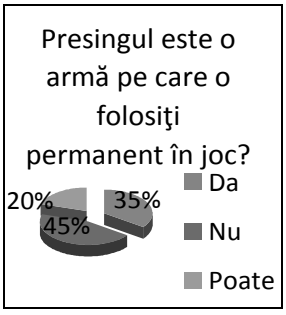

Figure 6. Pressing is a permanent tactical "weapon" used in the game?

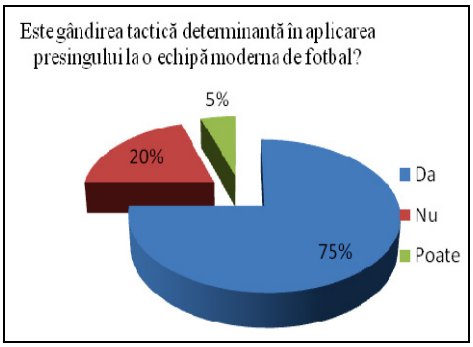

Figure 7. Tactical thinking is crucial in the application of pressing in modern football?

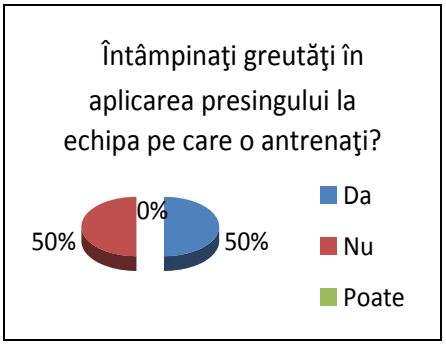

Figure 8. Do you encounter difficulties at the team you train?

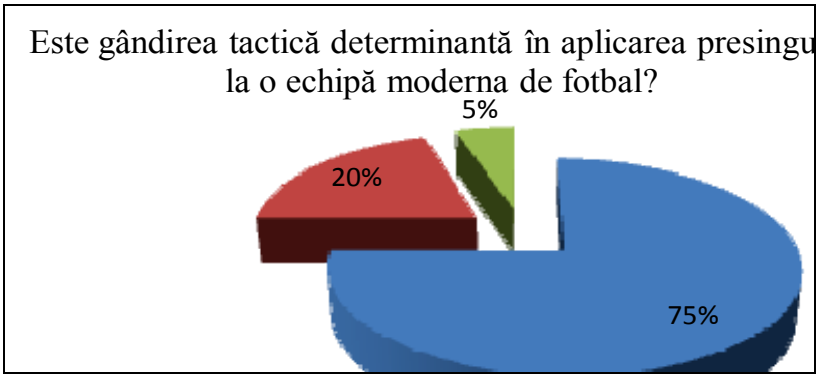

Figure 9. Tactical thinking is crucial in the application of pressing in modern football?

Conclusions

Studing recording sheets, the results obtained by analyzing the questionnaires, observations made at different matches, as well as bibliographic material study, led me to the following conclusions :

- Pressing is realised at the player with the ball, but also at his;
- Reduction of space and time of thought, action of the opponent team, to limit the solutions for the player that has the ball;
- For 75 % of respondents technicians tactical thinking is crucial in the current football.
- Pressing efficiency will depend upon the physical training of the team, the psychological capacity, place where the action take place and the unitary cohesion.

- Pressing is useful and necessary not only in the big teams but also teams at lower levels, it must become a core component of tactical training at this level.

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INFLUENCE OF ACUTE HYPOBARIC HYPOXIA, OZONE EXPOSURE AND LYCOPENE ADMINISTRATION ON THE TISSUE OXIDANT/ ANTIOXIDANT BALANCE IN PHYSICAL EXERCISE STUDIED IN THE BRAIN

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ABSTRACT. *Background:* The antioxidant effects of lycopene, evidenced *in vitro* and *in vivo* under pathological conditions, made us study in an experimental model of complex combined stress (exposure to moderate hypobaric hypoxia, ozone and physical exercise) the acute changes in the tissue oxidant/antioxidant (O/AO) balance following lycopene supplementation. *Aims***:** The influence of acute hypobaric hypoxia, ozone exposure and lycopene supplementation on tissue redox homeostasis under physical exercise conditions was studied in the brain. *Material and methods:* The researches were performed in 6 groups of white male Wistar rats: group I – control group, sedentary rats under normoxia conditions; group II – sedentary rats exposed to acute combined stress: hypobaric hypoxia (corresponding to a 2500 m altitude) and acute O_3; group III- animals exposed to acute combined stress - moderate hypoxia + acute O_3 -, followed by exercise, under normoxia conditions; group IV - sedentary rats under normoxia conditions, with lycopene administration; group V - animals exposed to acute combined stress - moderate hypoxia + acute O_3 -, followed by lycopene administration; group VI - animals exposed to acute combined stress - moderate hypoxia + acute O_3 -, followed by lycopene administration and daily exercise, under normoxia conditions. Exposure was simulated in the hypobaric chamber for 3 days, 20 hours a day, at 2500 m. Groups III and VI were trained daily for 3 days under normoxia conditions, by the swimming test. Groups IV, V and VI received 0.0375 mg/kg body weight lycopene by oral gavage, (before exercise by group VI), daily. In order to measure the indicators of the oxidant/antioxidant (O/AO) balance, tissue samples were taken from the brain. On day 3, the following were determined: malondialdehyde (MDA), protein carbonyls (PC), hydrogen donor capacity (HD) and total sulfhydryl (SH) groups. *Results:* Our experimental results obtained in animals that were exercise trained for 3 days and subjected to combined acute stress – hypobaric hypoxia and O_3 – and lycopene administration, support the favorable effects of lycopene as an antioxidant on the brain under rest conditions. *Conclusions:* Lycopene administration in animals subjected to combined acute stress – hypobaric hypoxia and O_3, followed by exercise – determines an increase in AO defense on account of HD in the brain, and a decrease in AO defense on account of SH in the brain, compared to control animals.

Keywords: acute exposure, hypobaric hypoxia, ozone, lycopene, oxidant/ antioxidant balance, physical exercise, brain.

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REZUMAT. ***Influenţa expunerii acute la hipoxie hipobară, ozon şi administrării de licopin asupra balanţei tisulare oxidanţi/ antioxidanţi în efort fizic studiat în creier.*** *Premize.* Efectele antioxidante ale Licopinului, evidenţiate *in vitro* şi *in vivo* în condiţii patologice, ne-au determinat să studiem pe un model experimental de stres complex combinat (expunere la hipoxie hipobară moderată, ozon şi efort fizic), modificările acute ale balanţei oxidanţi/ antioxidanţi (O/AO) la nivel tisular, după suplimentare cu Licopin. *Obiective***:** S-a studiat influenţa postexpunerii acute la hipoxie hipobară, ozon şi suplimentării cu Licopin asupra homeostaziei redox tisulare postefort la nivelul creierului. *Materiale şi metode:* Cercetările au fost efectuate pe 6 loturi de şobolani albi masculi rasa Wistar: Lotul I – control, sedentari în condiţii de normoxie; Lotul II – animale sedentare, expuse la stres combinat acut - hipoxie hipobară (corespunzător altitudinii 2500 m) şi O_3; Lotul III - animale expuse la un stres acut combinat - hipoxie moderată şi O_3 - urmat de efort, în condiţii de normoxie; Lotul IV - animale sedentare în condiţii de normoxie, cu administrare de Licopin; Lotul V – animale sedentare expuse la stres combinat acut - hipoxie hipobară şi O_3 - urmat de administrare de Licopin; Lotul VI– animale expuse la un stres acut combinat - hipoxie moderată şi O_3 - urmat de administrarea de Licopin şi efort zilnic, în condiţii de normoxie. Expunerea simulată s-a făcut la camera hipobarică timp de 3 zile, 20 de ore pe zi la 2500 m. Loturile III şi VI au fost antrenate zilnic timp de 3 zile în condiţii de normoxie, prin proba de înot. La loturile IV, V şi VI s-a administrat zilnic (preefort la lotul VI) Licopin în cantitate de 0,0375 mg/ kg corp, prin gavaj pe cale orală. În vederea determinării indicatorilor balanţei oxidanţi/ antioxidanţi (O/ AO) s-au recoltat probe din creier. În ziua a 3-a s-au determinat: malondialdehida (MDA), proteinele carbonilate (PC), capacitatea donor de hidrogen (DH) şi conţinutul de grupări sulfhidril totale (SH). *Rezultate:* Rezultatele noastre obţinute experimental pe animale antrenate la efort fizic timp de 3 zile supuse stresului acut combinat – hipoxie hipobară şi O_3 – şi administrării de Licopin, pledează pentru efectele favorabile ale acestuia ca antioxidant la nivelul creierului în condiţii de repaus. *Concluzii:* Administrarea de Licopin la animale supuse unui stres acut combinat – hipoxie hipobară şi O_3, urmat de efort – determină creşterea apărării AO pe seama DH în creier şi scăderea apărării AO pe seama grupărilor SH în creier, faţă de animale martor.

Cuvinte cheie: expunere acută, hipoxia hipobară, ozon, Licopin, balanţa oxidanţi/ antioxidanţi, efort fizic, creier.

Background

Physical activity stimulates various brain chemicals that may leave you feel happier and more relaxed. You may also feel yourself better about your appearance and when you exercise regularly, this can boosts your confidence and improve your self-esteem. Physical exercise has become a potentially

beneficial therapy for reducing neurodegeneration symptoms in Alzheimer's disease (Revilla, S., 2014). Furthermore, physical exercise is a promising nonpharmaceutical intervention to prevent age-related cognitive decline and neurodegenerative diseases. (Bherer, L., 2013)

In his studies, Snigdha suggests mechanisms to improve overall consolidation. Cognitive function remain accessible even with progressing age and it can be re-engaged by both acute and chronic exercise (Snigdha, S., 2014). Moreover, Revilla highlights the fact in his research that different interrelated mechanisms are involved in the beneficial effects of exercise on synaptic plasticity alterations in the 3xTg-AD mouse model (Revilla, S., 2014).

In addition, Hypoxia stimulates cerebral oxidative-nitrative stress (Baylei, D.M., 2009). The prenatal exposure of 1.0 ppm ozone causes embryonic/fetal changes manifested in postnatal levels of noradrenaline concentrations in the brains of rats (Custodio, V., 2010).

On the other hand, lycopene, a carotenoid compound, is a potent antioxidant with demonstrated neuroprotective properties in several experimental models of oxidative damage. Ou's studies suggest that lycopene affords protection against Methylmercury-induced neurotoxicity in cerebellar granule neurons. These beneficial effects of lycopene may be attributable to its roles in preventing mitochondrial dysfunction (Qu, M., 2013). Orally administered lycopene is accumulated in the body, and provided protections against ischemia/ reperfusion-induced brain injury by inducing an increase in SOD activity and inhibiting apoptosis (Fujita, K., 2013).

The antioxidant effects of lycopene, evidenced *in vitro* and *in vivo* under pathological conditions, made us study in an experimental model of complex combined stress (exposure to moderate hypobaric hypoxia, ozone and physical exercise) the acute changes in the tissue oxidant/antioxidant (O/AO) balance following lycopene supplementation (Ugron, Á et al, 2011 and 2012).

Aims

The influence of acute hypobaric hypoxia, ozone exposure and lycopene supplementation on tissue redox homeostasis under physical exercise conditions was studied in the brain.

Material and Methods

The research was performed in the experimental laboratory of the Department of Physiology of the "Iuliu Haţieganu" University of Medicine and Pharmacy Cluj-Napoca, in 6 groups of white male Wistar rats (n=10 animals / group), with a weight of 280-300 g, maintained under adequate vivarium conditions. The animal protection legislation in force was respected during the experimental researches.

Groups

The groups were divided as follows:

- group I – control group, sedentary rats under normoxia conditions;
- group II – sedentary rats exposed to acute combined stress: hypobaric hypoxia (corresponding to a 2500 m altitude) and acute O_3;
- group III- animals exposed to acute combined stress - moderate hypoxia + acute O_3 -, followed by exercise, under normoxia conditions;
- group IV - sedentary rats under normoxia conditions, with lycopene administration;
- group V - animals exposed to acute combined stress - moderate hypoxia + acute O_3 -, followed by lycopene administration;
- group VI - animals exposed to acute combined stress - moderate hypoxia + acute O_3 -, followed by lycopene administration and daily exercise, under normoxia conditions.
- Normoxia corresponding to the altitude of 363 m, O_2: 20, 94 %, pO_2 air: 117 mmHg;

Methods

a) *The exposure to acute moderate hypoxia*

The exposure to moderate hypoxia was for 3 days, 20 hours/day at values of 2500 m, pO_2 – 117 mmHg, 15%, using hypoxic rooms from the Experimental Laboratory of the Departament of Physiology.

b) *The exposure to ozone*

The rats were exposed to ozone for 3 days, 5 min/day at values of 0.5 ppm, according to EU norms, using an AIR O_3NE Labor apparatus (SC Triox SRL).

c) *Exercise test*

Groups III and VI was trained daily for 3 days under normoxia conditions by the swimming test. The test was performed in a pool with thermostatic water at 23ºC.

d) *Lycopene administration*

Groups IV, V and VI received 0.0375 mg/kg body weight lycopene by oral gavage, (before exercise by group VI), daily. Lycopene is product to the Hungaronatura Hungary and import to the SC. Herbavit Srl.

e) *Exploration of the oxidant-antioxidant balance*

Biochemical determinations were performed in the Laboratory for the Study of Oxidative Stress of the Department of Physiology of the "Iuliu Haţieganu" University of Medicine and Pharmacy Cluj-Napoca.

In order to determine the indicators of the oxidant/antioxidant balance, tissue samples from the brain, myocardium, lungs and quadriceps muscle of the anesthetized animals were taken. The analyzed time moment was day 3.

The following oxidative stress indicators were measured:

- malondialdehyde (MDA) the fluorescence dosage method, according to Conti (2001); the concentration values are expressed in *nmol/mg.*
- protein carbonyls (PC) determination of protein carbonyls according to Reznick (1994); the concentration values are expressed in *nmol/mg protein*.

The following antioxidant defense indicators were determined:

- hydrogen donor capacity (HD) dosage method according to Janaszewska (2002); the values were expressed as per cent of free radical inhibition *(i%)*;
- sulfhydryl (thiol) group content (SH) determination of SH groups according to Hu (1994); the values are expressed in *μmol/mg.*

f) *Statistical analysis* was performed using SPSS 19.0 and Microsft Excel.

The data were introduced in a SPSS v.19 database and analyzed with adequate statistical methods. A univariate statistical analysis was used for the description of the studied groups. Quantitative variables were summarized using mean ± standard deviation, 95% confidence interval for means. According to the laboratory values, the values for the control group were normal. A bivariate statistical analysis (Pearson correlation, One-Way Anova and LSD post-hoc test) was used to identify the significant association between the groups and between the indicators of the tissue O/AO balance (MDA, PC, HD and SH) was set at $p \leq 0.05$ for analyses.

Results

Comparative statistical analysis of the indicators of the tissue O/AO balance

The indicators of the tissue O/AO balance were compared between sedentary animals and animals performing physical exercise, under normoxia conditions after hypobaric hypoxia and O3 exposure, and lycopene administration. The majority of the comparisons were significant (Tables I-IV).

Comparative statistical analysis of the indicators of the tissue O/AO balance between groups is shown in Table I-IV, and comparative statistical analysis of the indicators of the tissue O/AO balance on the same group is shown in Table V-X.

Comparative statistical analysis of the indicators of the O/AO balance in the brain and between groups

Comparative statistical analysis of the indicators of the O/AO balance in the brain in the studied groups is shown in Table I-IV.

Table I.

MDA in brain (values in nmoli/mg)

Group	Mean	Std. Deviation	Std. Error	I.C. 95%		Values p
				Lower limit	Upper limit	
Group I	.07550	.002646	.001323	.07129	.07971	I-II= **.001**; I-III =**.000**; I-IV=**.000**; I-V=**.001**; I-VI=**.002**; II-III=.503; II-IV=.063; II-V=**.866**; II-VI=.814; III-IV=.210; III-V=.614; III-VI=.368: IV-V=.087; IV-VI=**.039**; V-VI=.686
Group II	.10350	.001291	.000645	.10145	.10555	
Group III	.10850	.005802	.002901	.09927	.11773	
Group IV	.11800	.015011	.007506	.09411	.14189	
Group V	.10475	.018209	.009105	.07577	.13373	
Group VI	.10175	.006500	.003250	.09141	.11209	

Table II.

PC in brain (values in nmoli/mg)

Group	Mean	Std. Deviation	Std. Error	I.C. 95%		Values p
				Lower limit	Upper limit	
Group I	.69900	.029337	.014669	.65232	.74568	I-II=**.000**; I-III =**.001**; I-IV=**.002**; I-V=**.000**; I-VI=**.000**; II-III=**.000**; II-IV=**.000**; II-V=**.000**; II-VI=**.000**; III-IV=.572; III-V=**.000**; III-VI=**.000**; IV-V=**.000**; IV-VI=**.000**; V-VI=**.000**
Group II	2.23050	.208599	.104300	1.89857	2.56243	
Group III	.32950	.123065	.061533	.13368	.52532	
Group IV	.38125	.146247	.073124	.14854	.61396	
Group V	1.35800	.089499	.044749	1.21559	1.50041	
Group VI	1.84125	.089894	.044947	1.69821	1.98429	

Table III.

HD in brain (values in i%)

Group	Mean	Std. Deviation	Std. Error	I.C. 95%		Values p
				Lower limit	Upper limit	
Group I	35.95525	1.444496	.722248	33.65673	38.25377	I-II=**.001**; I-III=.115; I-IV=**.002**; I-V=**.000**; I-VI=**.000**; II-III=**.033**; II-IV=**.000**; II-V=**.000**; II-VI= **.000**; III-IV=**.000**; III-V=**.000**; III-VI=**.000**; IV-V=**.000**; IV-VI=**.000**; V-VI=.086
Group II	33.32725	.872612	.436306	31.93873	34.71577	
Group III	34.85825	.726419	.363210	33.70235	36.01415	
Group IV	38.32675	.462377	.231189	37.59100	39.06250	
Group V	44.99100	.985500	.492750	43.42285	46.55915	
Group VI	46.19475	.836044	.418022	44.86442	47.52508	

Table IV.

SH in brain (values in μmoli/mg)

Group	Mean	Std. Deviation	Std. Error	I.C. 95%		Values p
				Lower limit	Upper limit	
Group I	.05525	.002500	.001250	.05127	.05923	I-II= **.000**; I-III =**.000**; I-IV=**.000**; I-V=**.000**; I-VI=**.000**; II-III=.210; II-IV=.784; II-V=.112; II-VI=**.000**; III-IV=.132; III-V=.715; III-VI=**.001**; IV-V=.067; IV-VI=**.000**; V-VI=**.002**
Group II	.02750	.001291	.000645	.02545	.02955	
Group III	.03100	.007789	.003894	.01861	.04339	
Group IV	.02675	.000957	.000479	.02523	.02827	
Group V	.03200	.001826	.000913	.02909	.03491	
Group VI	.04175	.003775	.001887	.03574	.04776	

Analysis of the correlation between indicators of the tissue O/AO balance, for each group

Analysis of the correlation between indicators of the O/AO balance, in brain, in the studied groups and significance is shown in Table V-X.

Table V.

The indicators of the O/AO balance at the group I, in the brain

Group I	Mean	Std. Deviation	Std. Error	I.C. 95%		Values p
				Lower limit	Upper limit	
MDA	.07550	.002646	.001323	.07129	.07971	MDA-PC=.944; MDA-HD=.802; MDA-SH=.672; PC-HD=.744; PC-SH=.373; HD-SH=.100
PC	.69900	.029337	.014669	.65232	.74568	
HD	35.95525	1.444496	.722248	33.65673	38.25377	
SH	.05525	.002500	.001250	.05127	.05923	

Table VI.

The indicators of the O/AO balance at the group II, in the brain

Group II	Mean	Std. Deviation	Std. Error	I.C. 95%		Values p
				Lower limit	Upper limit	
MDA	.10350	.001291	.000645	.10145	.10555	MDA-PC=.088; MDA-HD=.584; MDA-SH=.800; PC-HD=.847; PC-SH=.917; HD-SH=**.028**
PC	2.23050	.208599	.104300	1.89857	2.56243	
HD	33.32725	.872612	.436306	31.93873	34.71577	
SH	.02750	.001291	.000645	.02545	.02955	

Table VII.

The indicators of the O/AO balance at the group III, in the brain

Group III	Mean	Std. Deviation	Std. Error	I.C. 95%		Values p
				Lower limit	Upper limit	
MDA	.10850	.005802	.002901	.09927	.11773	MDA-PC=.547; MDA-HD=.069; MDA-SH=.948; PC-HD=.883; PC-SH=.124; HD-SH=.684
PC	.32950	.123065	.061533	.13368	.52532	
HD	34.85825	.726419	.363210	33.70235	36.01415	
SH	.03100	.007789	.003894	.01861	.04339	

Table VIII.

The indicators of the O/AO balance at the group IV, in the brain

Group IV	Mean	Std. Deviation	Std. Error	I.C. 95%		Values p
				Lower limit	Upper limit	
MDA	.11800	.015011	.007506	.09411	.14189	MDA-PC=.207; MDA-HD=.639; MDA-SH=.**049;** PC-HD=.835; PC-SH=.264; HD-SH=.809
PC	.38125	.146247	.073124	.14854	.61396	
HD	38.32675	.462377	.231189	37.59100	39.06250	
SH	.02675	.000957	.000479	.02523	.02827	

Table IX.

The indicators of the O/AO balance at the group V, in the brain

Group V	Mean	Std. Deviation	Std. Error	I.C. 95%		Values p
				Lower limit	Upper limit	
MDA	.10475	.018209	.009105	.07577	.13373	MDA-PC=.197; MDA-HD=.337; MDA-SH=.459; PC-HD=.053; PC-SH=.072; HD-SH=.**026**
PC	1.35800	.089499	.044749	1.21559	1.50041	
HD	44.99100	.985500	.492750	43.42285	46.55915	
SH	.03200	.001826	.000913	.02909	.03491	

Table X.

The indicators of the O/AO balance at the group VI, in the brain

Group VI	Mean	Std. Deviation	Std. Error	I.C. 95%		Values p
				Lower limit	Upper limit	
MDA	.10175	.006500	.003250	.09141	.11209	MDA-PC=.658; MDA-HD=.932; MDA-SH=.677; PC-HD=.225; PC-SH=.837; HD-SH=.503
PC	1.84125	.089894	.044947	1.69821	1.98429	
HD	46.19475	.836044	.418022	44.86442	47.52508	
SH	.04175	.003775	.001887	.03574	.04776	

The analysis of the correlations between the indicators of the tissue O/AO balance evidences significant correlations in the brain: in animals exposed to ozone and hypoxia, between HD and SH, group II (Table VI), in sedentary animals receiving lycopene, between MDA and SH, group IV (Table VIII), as well as in animals acutely exposed to hypoxia and O_3 followed by lycopene supplementation, between HD and SH, group V (Table IX);

A comparative analysis of the indicators of the tissue O/AO balance

Observation: group numbering in the figures is with Arabic numerals. Group I – 1; Group II – 2; Group III – 3; Group IV – 4; Group V – 5; Group VI – 6.

In the brain of animals acutely exposed to moderate hypoxia and O_3, with lycopene administration (group V) or with lycopene administration followed by exercise (group VI), a significant increase in AO defense on account of HD was found compared to the groups exposed to the same conditions, without lycopene administration (groups II and III) (Fig. 3). In animals acutely exposed to moderate hypoxia and O_3, with lycopene administration followed by exercise (group VI), a significant increase in OS on account of PC (Fig. 2) and changes in AO defense with a significant increase in SH (Fig. 4) were found compared to animals acutely exposed to moderate hypoxia and O_3, with lycopene administration (group V).

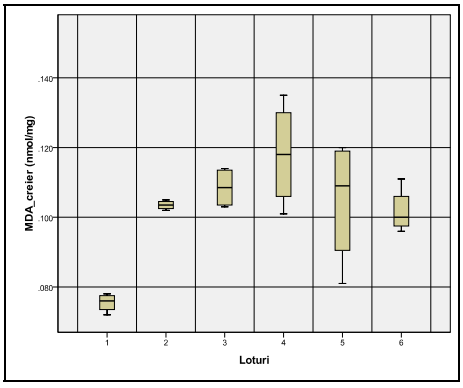

Fig. 1. MDA in the brain

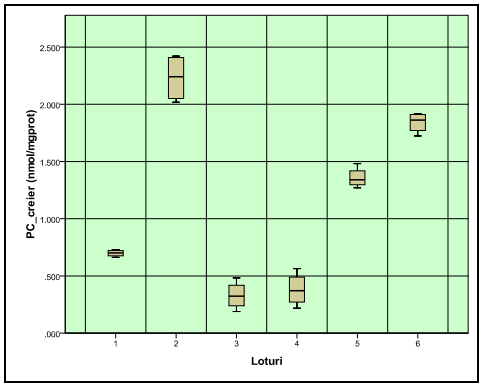

Fig. 2. PC in the brain

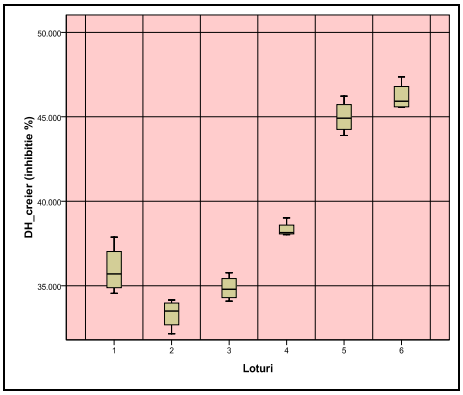

Fig. 3. HD in the brain

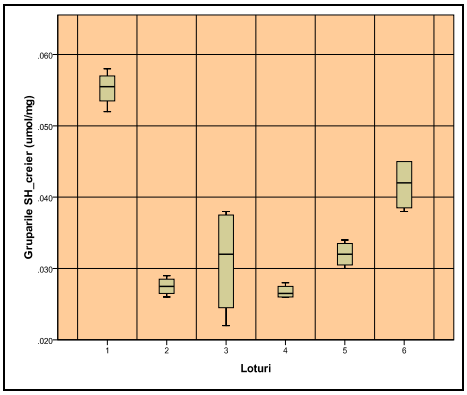

Fig. 4. SH in the brain

Discussion

Acute exposure to hypobaric hypoxia and O_3 followed by lycopene administration (group V), compared to acute exposure to hypobaric hypoxia and O_3 (group II) determines a significant decrease of PC and a significant increase of HD in the brain.

The association of acute hypobaric hypoxia and O_3 exposure with lycopene administration followed by exercise (group VI), compared to acute hypobaric hypoxia and O_3 exposure followed by exercise (group III) determines a significant increase of PC, HD and SH in the brain.

Moderate hypoxia and O_3 exposure, with lycopene administration followed by exercise (group VI), compared to acute hypobaric hypoxia and O_3 exposure followed by lycopene administration (group V), determines a significant increase of PC and SH in the brain.

Our experimental results obtained in animals that were exercise trained for 3 days and subjected to combined acute stress – hypobaric hypoxia and O_3 – and lycopene administration, on which we found no literature studies, support the favorable effects of lycopene as an antioxidant on the brain under rest conditions.

The AO effects of lycopene can be associated with hypoxic preconditioning and with the protective effects of O_3.

Conclusions

1. Lycopene administration in sedentary animals subjected to combined acute stress – hypobaric hypoxia and O_3 – determines an increase in OS on account of MDA and PC in the brain compared to control animals.
2. Lycopene administration in sedentary animals subjected to combined acute stress – hypobaric hypoxia and O_3 – determines an increase in AO defense on account of HD in the brain, compared to control animals.
3. Lycopene administration in animals subjected to combined acute stress – hypobaric hypoxia and O_3, followed by exercise – determines an increase in OS on account of MDA and PC in the brain, compared to control animals.
4. Lycopene administration in animals subjected to combined acute stress – hypobaric hypoxia and O_3, followed by exercise – determines an increase in AO defense on account of HD in the brain, and a decrease in AO defense on account of SH in the brain, compared to control animals.

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THE SPORT LIFE OF THE FIRST TRADE ACADEMY OF CLUJ (1878-1919)

ANDRÁS KILLYÉNI[*]

ABSTRACT. The sports life of the first Trade Academy of Cluj was an important chapter of the local sport history in the period before 1918. When the institution was founded special attention was paid to the teaching of physical education, and 35 years later the sports club of the institution grew into a well-known association nationwide, mostly due to football and skiing. The sports life at the academy started with providing physical exercise. From the moment when the institutions' sports club was founded the students started taking up the fashionable sports of the time such as skating, cycling and football. As football was gaining ground, more and more people played this team game, and by 1905 the team of the academy had become the best football association in Transylvania. But together with the closing of the institution in 1919, the sports association ceased, as well.

Keywords: Academy of Trade in Cluj, physical education, football, skiing, fencing, athletics, skating, cycling.

REZUMAT. ***Viaţa sportivă din prima Academie de Studii Economice din Cluj (1878-1919).*** Viaţa sportive a primei Academii de Studii Economice a însemnat un capitol important al istoriei sportului din perioada interbelică a oraşului Cluj. Din momentul înfiinţării institutului educaţia fizică a beneficiat de o atenţie specială, iar după 35 de ani clubul sportive al academiei a fost cunoscut pe plan naţional, în special rezultatelor excelente obţinute la fotbal şi schi. Începutul activităţilor sportive o constituie introducerea orelor de educaţie fizică. Din momentul în care clubul sportive a luat fiinţă studenţii au început să practice sporturile vremii: patinajul, ciclismul şi fotbalul. Odată cu răspândirea jocului de fotbal din ce în ce mai mulţi tineri au început să practice acest sport, iar în 1905 echipa academiei a devenit cea mai puternică echipă din Transilvania. Dar după dizolvarea instituţiei în 1919 clubul sportive a dispărut din viaţa sportive locală.

Cuvinte cheie: Academia de Studii Economice, educaţie fizică, fotbal, schi, scrimă, atletism, patinaj, ciclism

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Sándor Kiss

The idea of establishing a trade school came from János Herzl, a civilian school teacher, in 1878. In the first two years the institution operated in the building of the civilian boy school and under its government. In the 1880/81 school year they rented the Wesselényi-house in the centre of the town, and a year later moved in the rooms taken in lease at the Catholic Vicarage. In 1885 the Hungarian Minister of Religion and Education raised the rank of the institution to Academy and moved it in 1887 in a new building, situated on the corner of the Emil Isac street (in present the building of Polytechnic Institition). The number of students grew, so in 1893 the institute got a new building in Emil Isac street, at number 19th. (Sas 2003, 186-187)

Beginning with 1887/88 school year, the institute undertook educational tasks as well, when they became a boarding school. *A strong character, reliable behavior, knowledge of the duty and accuracy in work is indispensable in every course of life, but above all in a trading career* – admitted the Institute's management. (The Almanac of the institute from the 1902-03 year, ed. by Sándor Kiss, 7.) Sports and physical exercise were a great way of achieving this goal. The management realized this, and made a serious financial effort to introduce sports in the life of the students even if it wasn't in the curriculum. In this way they provided besides training a healthy life also. The students had the opportunity to exercise – athletics, gymnastics, football, skating, skiing, cycling, fencing etc – and the results were obvious: the professionals *that left the institute preferred to attend sports sites after work, than smoky coffee houses*. (The Almanac of the institute from the 1905-06 year, ed. by Sándor Kiss, 73.) The principal, Sándor Kiss held on to his principles: beside promoting and sponsoring physical exercises, the sport circle of the school and the preparation for competitions, he always remunerated the exceptional achievements.

Sándor Kiss (Sâncraiu (Covasna), 1849 – Cluj, 1914) he got his history-geography teacher degree at the University of Cluj. He started his career at the Trading School in 1879, later he became the principal of the institution. In recognition of his work, in 1894 he was named Knight of the Order of Franz Joseph, by the ruler itself. (Szinnyei VI., 388.)

With the change of the power after the I World War, the Trading Academy was liquidated, and its place was taken over by a new Romanian school founded by the Romanian Ministry of Education.

The evolution of the sport life

The management of the Trading School emphasized the importance of sports from the beginning by creating ways for students to work out. The principal Sándor Kiss knew that besides teaching, there is a real need for physical training, hygiene and the protection of health. (Kiss 1896, 235) The institute respected this principle throughout its activity and created the possibility of physical exercise.

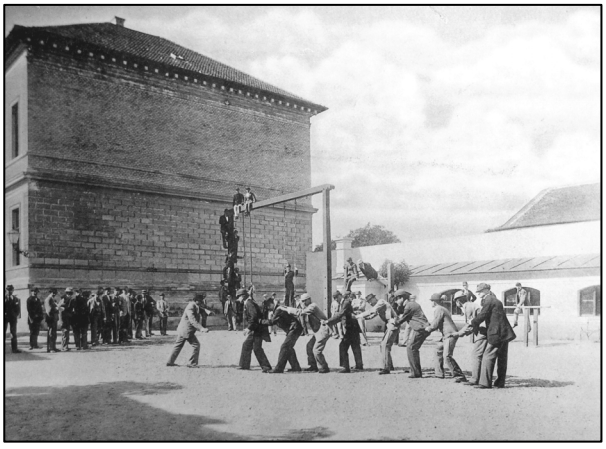
Oktáv Hangay
(Várpalota, 3rd April 1850 - Cluj, 11th March 1916)
He learned at the University of Zürich and Munich. He got his teacher degree in 1888 at the University of Cluj and worked as a teacher at the Trading School beginning with 1889. (Killyéni 2006, 65)

At the beginning the institute was not prepared to undertake the teaching of physical exercise as they were lacking a proper gym and a specialized trainer. This was a general problem in all Transylvanian and Hungarian schools, and the resolution came from the local Gymnastics and Fencing Associations. The school paid a fee and in return the association provided a gym and a trainer, so the students could exercise once a week in the local gym, called Tornavívóda - the building of the Athletic and Fencing Club, established in 1873, which was the first modern gym in Cluj. It was at the Széchenyi Square until the end of the 1930's, when it was demolished. Now the market hall is standing in its place. (Killyéni 2010, 10-20) The management of the Trading School decided to participate, so their students attended the activities of the Tornavívóda.

The sport specialists emphasized the sport achievements of the Trading School, and presented them to other schools as an example worth following. It is a fact, that due to the work of Sándor Kiss and Oktáv Hangay by the beginning of the 20th century the institute became a genuine sport centre. Their sport association created the proper ground for the rooting of football. Beginning with 1905, the sport circle was conducted by Róbert Kuntner, the

teacher of the school and Hangay. Kuntner was a very enthusiastic coach, who became a football player if the team needed. So it was no surprise, that the team was the best football team in Transylvania until 1914. Under these circumstances it was normal, that in the 1905/06 school year 116 students played football, 46 were fencing and 103 were gymnasts or athletes. (The Almanac of the institute from the 1905-06 year, ed. by Sándor Kiss, 73) The biggest challenge was the reinforcement of the team as at every end of the school year the team lost the graduate students. The key to this problem the sport association. With this, Kuntner and Hangay were able to assure the after growth. The two leaders with the help of the enthusiastic principal, Sándor Kiss founded a sport association which was exemplary, acknowledged and respected all over Hungary.

The majority of the students were boarders, so the management decided to provide the possibility to work out for them as well. As a first step, they placed in the court of the institute gym equipments, so the students could exercise in spring and fall under teacher's supervision. In 1895 the management decided to restore the old equipment, and purchased new ones: two barriers, a stretching pad, a climber and a swing. (The Almanac of the institute from the 1895-96 year, ed. by Sándor Kiss, 79)



Sport equipment in the Academy's court (middle of 1890's)

In the Tornavívóda Lajos Nyárádi was the trainer until 1880, followed by Károly Albert. After the sudden death of Albert, the institute sought some intermediate resolutions before approaching Gyula László, the sport teacher of the Unitarian College. From 1908 Ferenc Rázsó became the permanent trainer.

It did not take long for the results to emerge. In 1894 on the regional gymnastic competition the school was represented by a team of 50 gymnasts, and nine of them were awarded. The team members had red shirts, blue hats and blue belts at the presentation, and had nice programs on the free exercise and in the gymnastic competition. From the team Zoltán Benedek, Ferenc Füszfás, László,Guzman, Ferenc Holbráda, Béla Kovács, Gyula Köhler, Gyula Novák, Károly Schwimmer and Ernő Toperczer were awarded with prizes and diplomas. (Kiss 1896, 467)

In 27-28th of May 1905 a national gymnastics competition for high schools was held in Budapest, where 122 schools participated. At the opening ceremony the 32 students of the Trading Academy wore red hats and shirts with white belt, and were led by Gyula Wachsmann. The yearbook of the institute related about the outstanding achievements: *We can be proud of the final results, our students won in every competition they participated. The equitation team got the highest degree. Wachsmann Gyula was first in (running) climbing, Leitner János got bronze. They played füleslabda against the players from Miskolc, and they got mention. In tug of war our youth overtook the muscular students from Szentgothárd. The four honorable mention and the 22 medals brought home will be a memorable achievement in the history of the school.* (The Almanac of the institute from the 1904-05 year, ed. by Sándor Kiss, 75)

In the 1905/06 school year a dream came true, when the school's gym was inaugurated. Starting with 1908/09 school year, Ferenc Razsó qualified sport teacher was hired, and a new era begun in the sport life of the academy. Ferenc Razsó and his students prepared with enthusiasm for the national sport competition for 1909, but unfortunately it was called off in the last minute. It was a poor consolation that on 23 May 1909 the institute organized a gymnastic, athletic and fencing competition. László Benedek, Tivadar Gajzágó, Simon Harnik, Endre Márton, Béla Reisch and Ferenc Szalay were awarded in more than one competition number. (The Almanac of the institute from the 1908-09 year, ed. by Sándor Kiss, 64)

In the 1909/10 school year the team of the school had success on several sport competitions organized by associations countrywide. The sport teacher of the school summarized these achievements: *sporting is on such level in our school, that only a few institutes can equal us… all sports are practiced: Hangay Oktáv trained winter sports, Kuntner Róbert outside activities, Bagaméri József fencing and László Gyula gymnastics*. (The Almanac of the institute from the 1910-11 year, ed. by Sándor Kiss, 64) The school was proud that they managed to reduce the number of exempted students by the introduction of Swedish gymnastics.

Gymnastic training became harder at the end of the 1880's. In the Tornavívóda there was only one teacher for a lot of students (for example Károly Albert trained 2500 students in 40 hours/week) and the gym was not suitable for so many students. So in 1889, the institute equipped a fencing room in the school building, where the master Zoltán Páska led the trainings. Unfortunately this room was liquidated because the school needed the classroom. (Kiss 1896, 235)

In the new building of the school, beginning with 1893/94 school year a fencing room was equipped, where Mihály Kőváry fencing master trained with rigorous discipline the older students in sabre and foil fencing. (The Almanac of the institute from the 1893-94 year, ed. by Sándor Kiss, 119) In the next school year we can see fencing in the curriculum as an extraordinary

course, taught by Artúr Kőváry, four times a week. In 1897, at the fencing competition organized to celebrate the 25th anniversary of the Tornavívóda, 44 students of the Trading School participated. The remarkable achievements of Aladár Farkas and Dezső Csíky were awarded by the organizers. Artúr Kőváry received the recognition of his work. In 1898 the fencing competition of the high schools from Cluj was won by the team of the Trading Academy, and in individual competition Gyula Trojkó became the winner.

Beginning with 1900, the institute invited József Bagaméri fencing master and for a shorter period of time László Gerentsér university trainer to teach Italian fencing. Fencing was always a competition number at the gymnastic contest organized at the end of the school year, and the best fencer was always awarded, by the management.

In 1890, the institute did not have a proper building, the sporting possibilities were limited, and there was no fencing room, so the management accepted in 1891 the suggestion of Hangay to create a sport team. The idea was implemented, and so the Sphaira Sport Circle was organized mainly from the border students. Hangay initially wanted to organize a sport circle on Cluj level, but the conditions were not appropriate.

At the beginning of each year the members of the sport circle elected their officials. In 1897 the officials were: governor and ski master: Ferenc Nagy, bicycle master: Ferenc Appl, ball master: Gyula Trojkó, skating master: Kálmán Regényi, managers: Ferenc Szász, Sándor Klein, Gyula Grosz and Kornél Schwarcz. (The Almanac of the institute from the 1897-98 year, ed. by Sándor Kiss, 86) The circle was led for years by Oktáv Hangay.

The most popular sports were athletics: running, walking, high and long-jump, wrestling, shot-put, but they enjoyed cycling, skating in winter, and when time permitted: hiking.

The sport circle organized gymnastic competitions at the end of each school year. In 1894 the students competed in 150 and 200 meter sprint, high-jump and shot-put. After this, the competition was organized annually, with numbers in: gymnastic, fencing and athletics. By 1910 the athletes of the school were known on city level, due to their results on local competitions. We can emphasize the results of Ádám Bod with his 172 cm high jump and Ferenc Szalay's 619 cm long jump. (The Almanac of the institute from the 1910-11 year, ed. by Sándor Kiss, 66)

The introduction of skiing can be linked with the sport circle and with Oktáv Hangay in the 1894/95 school year. The steam of the academy was the first in Hungary to promote skiing. On the Millennium in 1896 the school presented the introduction of the Norvegian sport in pictures. The sport circle was ignored by the judges from Budapest, even if it was the only association with this character. (The Almanac of the institute from the 1896-97 year, ed. by Sándor Kiss, 137)

The skiers made the distance between the school and the margin of the city in the first winter. Three students– Ernő Toperczer, Vilmos Hulita and Lajos Birkás – had great success with their achievement: they skied from Cluj to Turda and back. (Kiss 1896, 468) Next winter the snow was also great, so under the conduction of Hangay they made a trip to Leghia, where they had great opportunities to ski. The sport became known, the skiers bought their own skies and two sleds. In winter they skied two-three times a week downhill on Hoia woods.

Sándor Hirschfeld

Skating was very popular among the borders of the school; neay 70 % of them skated. The Central Park was near, and the Skating Association gave price reduction for the students of the school. *The Skating Association of Kolozsvár gave a reduction of price to 2 forint for the students of the Trading School thanks to the intervention of Hangay Oktáv. The generosity of the leaders towards the students living far from their parents paid off, as 86 borders enrolled to the Skating Association, paying them 173 forints. Because the skating rink with its beautiful illumination and pavilion was at 5 minute distance from the school, the students attended it on a daily base, and sometimes the routine of the boarding school was changed so the students could spend as much as possible outdoor* - as the yearbook of the school related. (The Almanac of the institute from the 1896-97 year, ed. by Sándor Kiss, 137) The school organized skating competition for its students, in 1896 Jenő Mátéj, Béla Brutsy and Andor Melicskó were the winners.

In 1897 the skating association refused the price reduction for the students, so a part of the students went to the rinks from the court of the Tornavívóda and of the Diána Bath.

Cycling appeared in Cluj in the mid 1880's and became popular by the 1890's. In the 1896/97 school year, the Trading School embraced this sport, and 54 of its students became cyclers. The management of the school disposed a smaller room for the keeping of bicycles and skis. In cycle Ferenc Appl emerged, by being the best cycler in Cluj in the 1890's. Appl, as the leader of the Cycling Association, participated in several contests at the Millennium in 1896 and won. Beside this he was awarded in other contests, defeating well known cyclers from Budapest.

Appl had his greatest success in 1898 at the competition of the Bicycle Association of Cluj. Ferenc Greiner cycler, the significant member of MTK (and of Hungary) participated and won every number in the competition until the 5000 meter race. At this last number, the local favorite Appl and Greiner fought a huge battle, but the race ended with the victory of Appl, to the delight of the spectators. (Ellenzék, 5th April 1898) The enthusiastic crowd ran into the course, carried the winner on their shoulders all around, celebrating him, like a hero. The principal of the Trading Academy wrote in the yearbook of the school about this cycler and the student of the institute: *the sportsman, who brought two silver and three bronze medals beside the Special Award of Women from Kolozsvár, contributed consistently to the sport fame of the institute.* (The Almanac of the institute from the 1896-97 year, ed. by Sándor Kiss, 137)

This line of successes was soon interrupted by the introduction of the bicycle tax. The police monitored and penalized the cyclers who did not pay the new tax, so by 1900 the cycler group of 28 students ceased.

The nationally renowned football team

In 1896 football appeared in Cluj and was initially played by high school and university students. In 1902/03 the football team of the Trading Academy was established, and in the next 10 years they ruled the Transylvanian football life. The players of the first team were: Ernő Koncz, István Tóth, Ferenc Lesska, Ferenc Szilágyi, Bálint Törley, Hugó Weiner, Ottó Mixich, János Fleischer, József Epstein, István Zombory, Henrik Gross, Ernő Kósa, Béla Fuchs, Kázmér Kapsza and Gyula Waschmann. (The Almanac of the institute from the 1902-03 year, ed. by Sándor Kiss, 124)

In the 1904/05 school year, the team of the Trading School defeated twice the other football team of Cluj: the team of Athelitc Club with 3-1 and 3-2. The captain of the team was: Dezső Törley, the players were: János Wellisz – Manó Goldman, Dezső Törley – János Leitner, József Friedel – Sándor Beretvás, Ottó Róth, Kázmér Kapsza, Nándor Lukács, Jenő Strauch. (The Almanac of the institute from the 1904-05 year, ed. by Sándor Kiss, 75-76)

In 1905 Kuntner Róbert, the former football player in Budapest (BTC), became the teacher of the institute and the co-president of the sport circle. The young teacher played in the team as well, but his big achievement was the organization of this sport. 116 students of the institute played this game, Kuntner organized two selected teams. He introduced and conducted the trainings in an exemplary way, taught techniques and tactics so teamwork took over the individual playing. In the first year, the team managed to become the best one in Transylvania. The team with yellow-blue dress stepping on the football field was formed by: Brunner – Strauch, Vámos – Jeremiás, Leitner, Ábrahám – Beretvás, Róth, Kuntner, Daumé, Weiszfeiler. (The Almanac of the institute from the 1905-06 year, ed. by Sándor Kiss, 74)

The 1906/07 school year brought new successes. At the beginning of the school year many feared, because the best players of the last year's team finished and left the school. The new players rose to the expectation, so the generation change did not influence the success of the team. On the first championship organized by Athletic Club of Cluj, the team of the Trading School was the second out of six teams. They were defeated in the finals by the ACC Football Team, in the second continuance of the match. On June 2nd 1907, the team went to Budapest, where they were the guests of Törekvés Sport Club, a second league team. The Törekvés won with a 7:2 score, but the Trading School Team played well. It was obvious the difference between the standards of Cluj and Budapest. The organizers and the specialists praised the play of the team, which was formed by: Gajzágó – Strauch, Voith – Fehér, Bíró, Bárány – Daumé, Róth, Kuntner, Ábrahám, Lager. (The Almanac of the institute from the 1906-07 year, ed. by Sándor Kiss, 80)

Kuntner Róbert

(Budapest, 15 November 1882 – Budapest, 27th November 1954) University professor; he got his university degree in Budapest and Zürich. Beginning with 1905 he is a teacher at the Trading Academy, between 1913-19 he was the principal of the Upper School of Trades in Bratislava. From 1922 he is a professor at the Polytechnic of Budapest, between 1939-40 is the dean of the Faculty of Economics. Between 1948-50 he is a professor at the University of Economics of Budapest. (Killyéni 2006, 83)

In the fall of 1907 Kuntner established the Sport Association of the Trading Academy (SATA), so the football team received the rank of association. This was an important step, because the new rank allowed the former students to play in the team. With this, Kuntner laid the institutional football on modern principles. Beside this, he asked the admission of the three football teams –ACC, Trade Academy and Vasas from Cluj into the Hungarian Football Association (HFA) and consequently the organization of the Transylvanian Championship for these three teams. HFA was happy to accept the admitting teams, and announced the championship in two rounds for the spring of 1908. According to the rules of HFA, only certified players could participate in the championship. So the engagement of the players started, which led to the emulation of associations. The leaders of the clubs often accused each other with inveigle of players. (Killyéni 2006, 27)

The eastern regional championship was played by the three teams in the spring of 1908; the winner according to the goal rate was Sport Association of the Trading Academy. The achievement was noticed by the newspaper also: *the team of the Trading School won by merit, it is a real result. It is a well disciplined team, with many good players and good playing manners. The team is formed by: Gajzágó – Voith, Daumé – Héczey, Holacsek, Fehér – Hegyi, Nászta, Brunnhuber, Strauch, Veisz*. (Nemzeti Sport, 30th May 1908)

The curiosity of the match was, that Géza Dávid, the student of the Cathlic Gymnasium and the goalkeeper of the Athletic Club let in a slow ball, which could have been fenced off by any goalkeeper. Rudolf Koncz, the ACC captain of that

The football-team of the Sport Association of the Trading Academy

time evoked this championship after a few decades: *after the match we heard some dubious things about that bizarre goal let in by Dávid Géza. Later we used another goalkeeper. Years later we found out, that he was a big card player and he admitted, that he deliberately let in that goal after the bribe of Kuntner.* (according to Rudolf Koncz's autobiography – existing as a manuscript)

SATA played its first international match in November 1909. They defeated with 5-4 the Romanian Selected Team (correctly we should name it the selected team of Bucharest, because the players were foreign diplomats). In the spring following, on 1-2 May 1910, the Romanian Selection Team came to Cluj for a rematch, but was defeated by the SATA with 8-2.

In the 1910's the SATA joined the Hungarian pool, but the results did not reach the level of the elite teams of Budapest. It was obvious, that Transylvania's best team was progressing mostly in technique and was gaining experience. The sport circle had his best season before the I World War in 1911-12. They won seventeen matches, and played one stand-off. They lost only three matches against first league teams from Budapest. (Ellenzék, 24th July 1912)

In the summer of 1912 KKASK proved its value on a national level. On the first meeting for the Best Regional Champion title, they won with a 4-2 score against the champion of South-Hungary: the „Bácska" Subotica Sport Association. (Ellenzék, 15th July 1912) They defeated the North- Hungarian Champion, the Athlteic Club of Bratislava with 5-2, so the players from Cluj had their first chance to play a competition match on foreign land, as the final match took place in Budapest. The Western champion, the Tatabányai Sport Club proved to be stronger, as they won with a 9-1 score on an unusual sized, sandy football field. The Academy's team was: Welser II. – Welser I, Walter I – Petrán, Marci I., Stotter– Katona, Nászta, Sárossy, Nagy József, Klein. (Ellenzék, 12th August 1912)

A decree emitted in February 1913 by the Ministry of Culture prohibited students to be members of sports societies, stating that adult company affected their education. This had a negative impact on the life of the sport circle. The Minister of Culture asked the trainers and principals to implement the decree in the high schools; otherwise they will face disciplinary actions. (Ellenzék, 12th February 1913) This decision meant significant disadvantage for the SATA, as the team playing in the championship had six graduate student players out of 13. (Ellenzék, 24th July 1912) In the Transylvanian Championship in 1914 the team had no remarkable results, and during the war the competitions were suspended.

The Sport Association of the Trading Academy had a national reputation, but unfortunately after the war, with the ceasing of the Trading Academy, the Sport Circle also was also dissolved. This was the end of a beautiful chapter in the sports life of Cluj.

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INVENTORY AND EVALUATION OF GEOMORPHOLOGICAL CONDITIONS FROM BISTRIȚA ARDELEANĂ GORGE FOR PRACTICING RECREATIONAL SPORT ACTIVITIES

IOAN BÂCA[1,*], HOREA ŞTEFĂNESCU[2]

ABSTRACT. ***Inventory and evaluation of geomorphological conditions from Bistrița Ardeleană Gorge for practicing recreational sport activities*.** Bistrița Ardeleană Gorge is a geomorphological subunit located in the eastern part of Bistrița - Năsăud County, in the Bistrita Bârgăului commune and on the Bistrița Ardeleană River, at the border between Călimani Volcanic Plateau (Dealul Negru - Poiana Cofii) and Bârgău Mountains (Bridirei Ridge - Dealul Pietrei - Ariniș). Normal and periglacial modeling exerted on volcanic agglomerates from here has generated spectacular landforms represented by residual slopes, residual ridges and rock formations (walls, towers, poles, apostles). By their configuration and geomorphometry parameters (height, width, slope, energy, fragmentation) these landforms has a great potential for engaging in recreational activities like hiking, scrambling, ghyll scrambling, gorge walking, rock hopping, rock climbing, rappelling, via ferrata, tyrolean traverse, canyoning and mountain biking. This study proposes an interdisciplinary inventory and assessment of geomorphological conditions to develop future planning and tourist valorization projects of this area by local and county authorities.

Key words: Bistrița Ardeleană Gorge, volcanic conglomerates, activ leisure, hiking, climbing, rapelling, tyrolean traverse, scrambling, ghyll scrambling, gorge walking, rock hopping, canyoning, mountain biking

REZUMAT. ***Inventarierea şi evaluarea condiţiilor geomorfologice din Cheile Bistriţei Ardelene pentru practicarea activităţilor sportive recreaţionale.*** Cheile Bistriței Ardelene sunt o subunitate geomorfologică situată în partea de est a judeţului Bistrița-Năsăud, pe teritoriul comunei Bistrița Bârgăului şi pe râul Bistrița Ardeleană, la limita dintre Platoul Călimanilor (Culmea Dealul Negru-Poian Cofii) şi Munţii Bârgăului (culmea Bridirei - Dealul Pietrei - Ariniș). Modelarea fluvială şi periglaciară exercitată asupra aglomeratelor vulcanice de aici a generat un relief spectaculos, reprezentat prin abrupturi, versanţi reziduali, creste şi formaţiuni stâncoase reziduale (ziduri, turnuri, stâlpi, apostoli).

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Prin configuraţia şi parametrii lor geomorfometrici (înălţime, lăţime, pantă, energie, fragmentare) aceste forme de relief prezintă un potenţial deosebit pentru practicarea unor activităţi recreative de drumeţie, ascensiune montană, rock hopping, escaladă, rapel, via ferrata, traversare tiroliană, canyoning şi mountain biking. Studiul de faţă interdisciplinar îşi propune inventarierea şi evaluarea acestor condiţii geomorfologice în vederea elaborării unor proiecte viitoare de amenajare şi valorificare turistică a acestui areal de către autorităţile locale şi judeţene.

Cuvinte cheie: Cheile Bistriţei Ardelene, aglomerate vulcanice, turism activ, drumeţie, escaladă, rapel, tiroliană, scrambling, ghyll scrambling, gorge walking, rock hopping, canyoning, mountain biking

Introduction

In the last period of time there can be observed a growing demand for outdoor tourist activities which involve a certain level of adventure. In this regard, Bistriţa-Năsăud County has numerous attractive resources (landforms, water, vegetal units, and recreational sites) plus the tradition of leisure activities, particularly those relating to winter sports (Piatra Fântânele and Valea Blaznei areas).

The increased service intervals with time off, the access to advanced equipment and new approaches to information and cultural needs of the population (awareness, exploration, experimentation) are factors that give rise to a diversification of the activities of the county-level seating. As such, more and more people practice mountain biking, off road, rafting, paragliding, hiking, roller skating, etc., even if there are no special facilities for these activities.

One of the locations with a potential for sport and adventure tourism are the Bistriţa Ardeleană Gorge. They have, on the one hand, the resources for active tourism, and on the other hand, are located on the tourist axis Prundu Bârgăului-Colibiţa (resort, reservoir).

In this context, the present study aims to make and evaluate the geomorphological resources of this sector in order to prepare future projects for the development and exploitation of tourist area.

Methodology

For the present study, the following methodological steps were completed:

1) consulting literature relating to the Bistriţa Ardeleană Gorge and surrounding areas, represented by The Colibiţa Depression and Bârgău Mountains (Naum, T., Moldovan, Gr., 1984; Naum, T., Butnaru, E., 1989; Rusu, E., 1998; Bâca, I., Şteff, I., 2010);

2) completion of works about mountain sports activities carried out in areas with rocky formations and gorges (Bâca, I., 2013), in particular those of climbing (Suman, Gh., Babadag, D., 1987; Bisharat, A., 2009; Graydon, D., 1992; Green, S.M., Green, I.S., 2010; Kidd, T.W., Hazelrigs, Jennifer, 2009; Luebben, C., 2004; Magiera, A., Roczniok, R., Maszczyk, A., Czuba, M., Kantyka, Joanna, Kurek, P., 2014; Mastacan, F., 2000; Pesterfield, Heidi, 2011);

3) consultation of certain Wikipedia sites relating to tourism and sporting activities of hiking, climbing, canyoning, mountain biking, etc., such as:

-http://en.wikipedia.org/wiki/Hiking;
-http://en.wikipedia.org/wiki/Rock_climbing;
-http://en.wikipedia.org/wiki/Free_climbing;
-http://en.wikipedia.org/wiki/Free_solo_climbing;
-http://en.wikipedia.org/wiki/Sport_climbing;
-http://en.wikipedia.org/wiki/Bouldering;
-http://en.wikipedia.org/wiki/Canyoning;
-http://en.wikipedia.org/wiki/Mountain_biking;
-http://www.escalada.verticon.ro/trad/cursuri.htm;

4) carrying out field observations in the Bistriţa Ardeleană Gorge to inventory and assess the geomorphological potential for practicing tourism and sports activities;

5) pursuit of practical applications with students from the faculties of Physical Education and Sports, and Tourism Geography-Bistriţa Extension in Bistriţa Ardeleană Gorge to test the ground and the establishment of sports and recreational activities suitable for this area.

Study area

The Bistriţa Ardeleană Gorges are located in the eastern part of the Bistriţa-Năsăud County, in Bistriţa Bârgăului commune (fig. 1), are oriented on a WNW-ESE direction, have a length of 6 km and connect the Bistriţa Bârgăului Depression with the Colibiţa Depression (fig. 2).

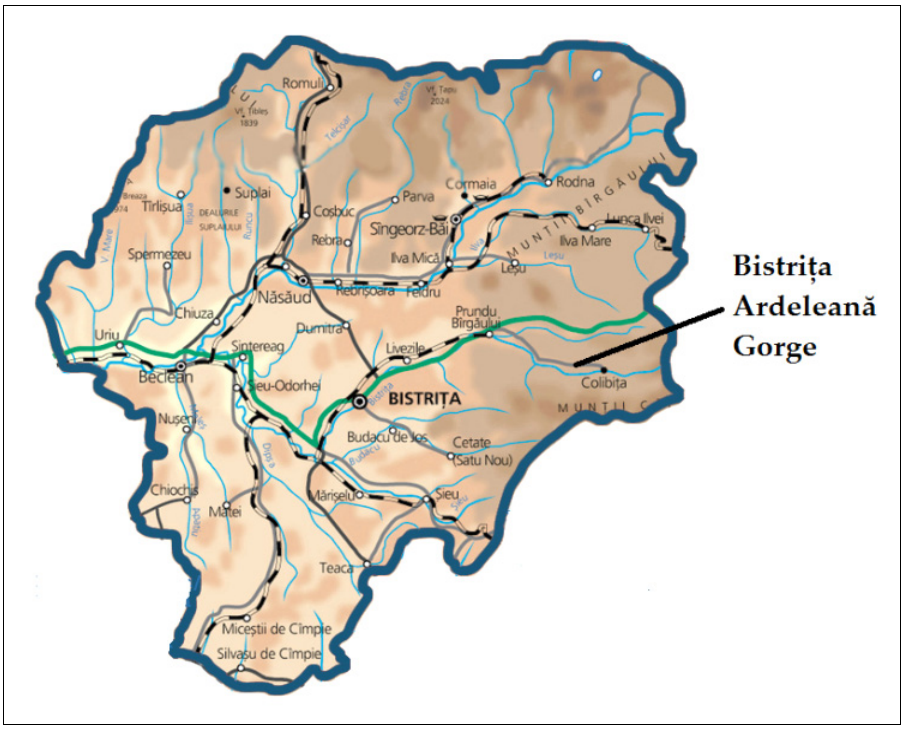

Fig. 1. Geografical location of Bistriţa Ardeleană Gorge in Bistriţa-Năsăud County

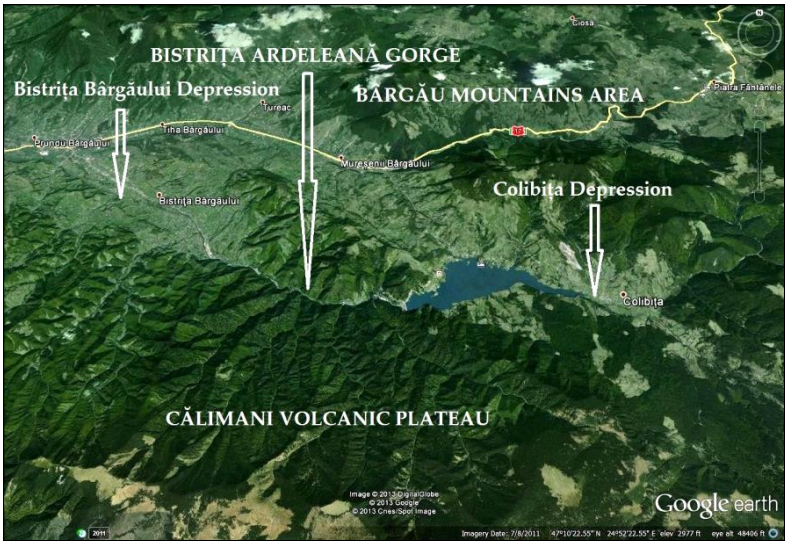

Fig. 2. The Geomorphological system Bistriţa Bârgăului Depression - Bistriţa Ardeleană Gorge - Colibiţa Depression

The Bistriţa Ardeleană Gorge was carved in the volcanic conglomerates of the Călimani Plateau (ashes, sands, gravels, andesitic blocks) from the upper pliocene by paleo Bistriţa River who has its spring in Poiana Calului area (the present Repedele creeek), and was heading westward where it met with paleo Bârgău River (paleoTiha) at Prundu Bârgăului (fig. 3).

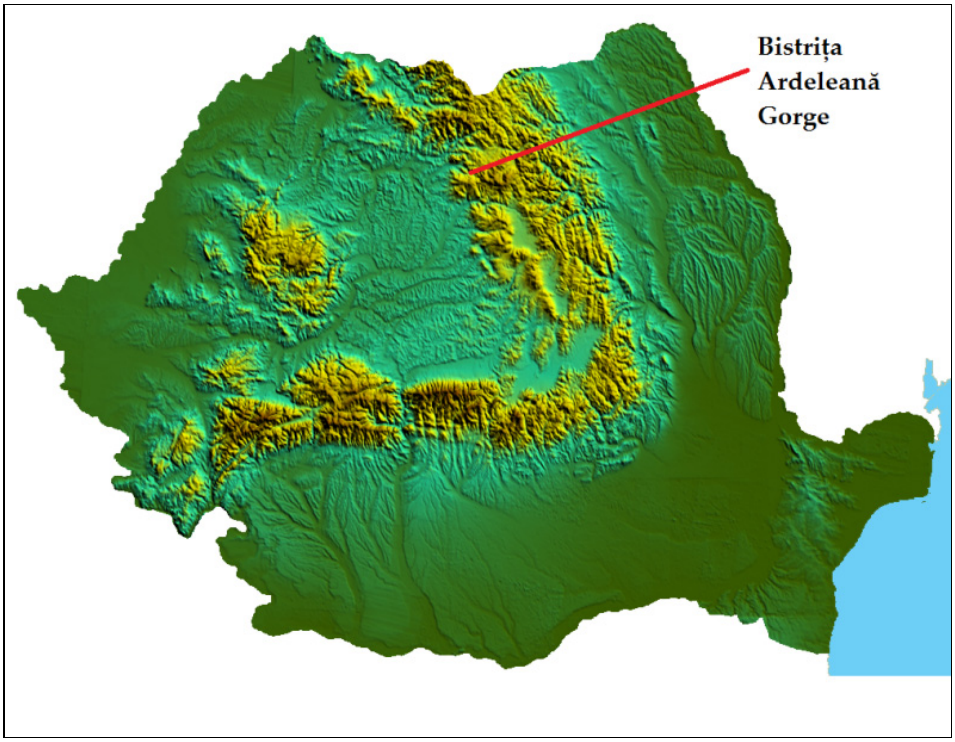

Fig.3. Geographical position of Bistriţa Ardeleană Gorge in Easthern Carpathian Chain

The antecedent and epigenetic character of this river is confirmed by the two levels of erosion in the gorge, located at 1000-1110 m (upper level) and 800-900 m (lower level) (fig. 4).

Being at an altitude lower than the rivers network which drained the Colibiţa Depression, and steer over Blaju Saddle toward paleo Bârgău River to the North, paleo Bistriţa River, spurred by the tectonic movements of Pliocene-Quaternary, was inlaid in the volcanic agglomerates, giving rise to a gorge sector, and expanded to the east front, penetrating the Colibiţa depression area and capturing the rivers here.

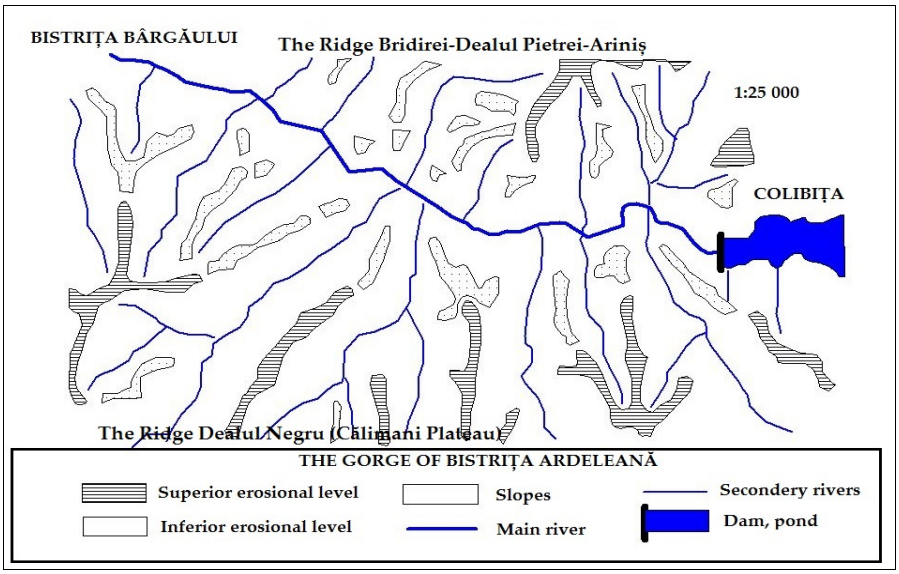

Fig. 4. Erosional levels in Bistrița Ardeleană Gorge

Hydrographic reshaping that took place along the upper pliocene crafted specific landforms, represented by systems of valleys, ridges and slopes, as well as through the two lowland areas, Bitrița Bârgăului and Colibița. At the dawn of Quaternary, the space between the intrusive massifs of the Bârgău Mountains and the volcanic area of the Călimani Mountains (Vulturul-Poiana Cofii- Moldoveanca-Scurtu) was completely carved, from a hydrographical point of view, giving the current configuration (fig. 5).

In the late Pleistocene, with the cooling of the climate and installation of Quaternary Ice Age, the Bistrița Ardeleană Gorge sectors is governed by periglacial erosion, in the cryo-nival level (700-1600 m), where the gelives and gelifraction processes were intense, colluding with the nival processes in the cold season, and with the river erosion in the warmest period of the year.

Morphogenetic processes have acted upon the preexisting morphology and rock formations composed of volcanic conglomerates, creating cryogenic and cryo-nival landforms. Cryogenic landforms are represented by residual landforms and detritic deposits (the detritic layer). The gelifraction landforms consists of forms resulted from releasing of weathering products of the surface of slopes and ridges, and from longitudinal profile of the valleys, such as: steeps, gelifraction creeks, peaks, col and residual ridges, walls, niches and caves, waterfalls and steps in the rivers profile.

The Geomorphological pattern of Bistrița Ardeleană Gorge is represented by the main valley, dominated by the cliffs located at the end of

the ridges that converge to it, separated by a couple of secondary valleys, of which the most important are Arşiţa Stegea, Şoimu and Repedele.

In vertical section, in the gorge the distinction is made between the three floors: the residual ridges floor (900-1100 m), marked by sharp peaks, towers, warthog, etc.; the residual slopes floor (650-900 m), marked by steep, residual creeks, niches, caves, cryo-nival culoirs, rocky formations (walls, columns, needle-like, etc.), and the valleys floor (650-700 m), marked by narrow or broader sectors, where floodplain areas reaching 60-100 m maximum width (Poiana Stegea), terraces, aluvial fans and coluvial slopes (fig. 5).

Detritic deposits are represented by the masses of debris, made up of rock of various sizes created by weathering processes, which can be found on the slopes, in the rivers-bed, and on the basis of the cliffs where it forms debris slopes. These debris can be fossilized by a thin blanket of soil, covered with forest vegetation or is up to date, especially those that have large size (blocks).

The Cryo-nival landforms resulted through the combined action of freeze-thaw cycles and nival processes and are represented by the cryo-nival couloirs. They are located on the flanks of the Bistriţa Ardeleană River and on the slopes of secondary valleys, were sketched by shaping pre-existing torrential valleys under mechanical action of snow and of weathering processes; they have a semi-circle profile, and may be flared to upper section (fig. 6).

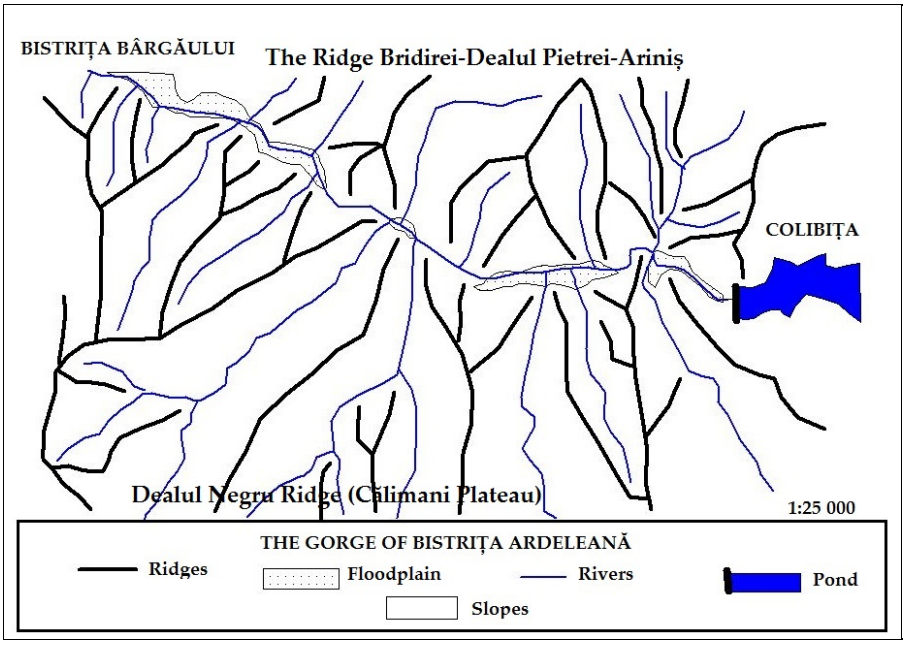

Fig. 5. The geomorphological pattern of Bistriţa Ardeleană Gorge

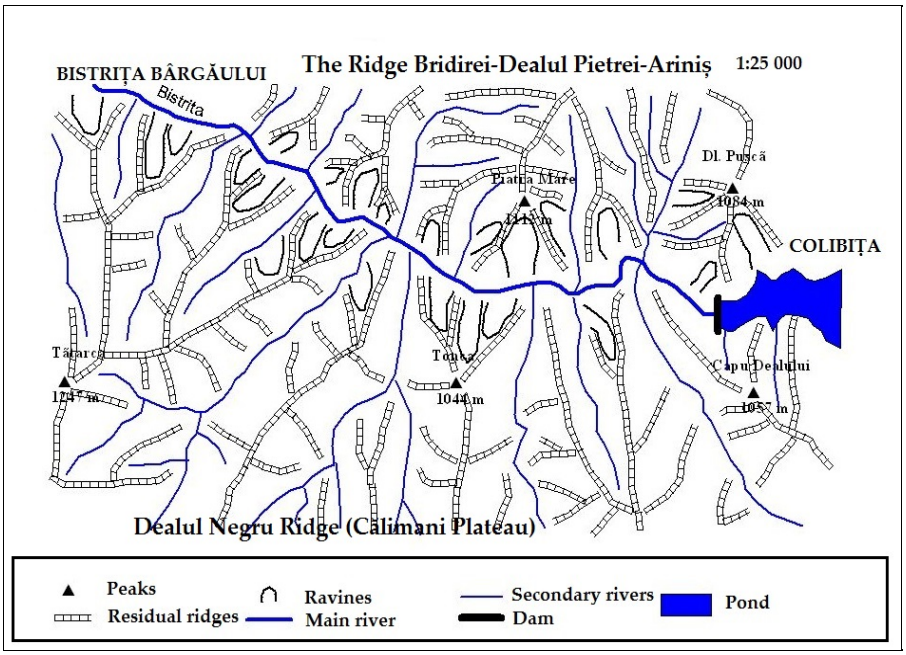

Fig. 6. Periglacial landforms in Bistriţa Ardeleană Gorge

Results and discussion

1. Geomorphological features

Field research conducted in the Bistriţa Ardeleană Gorge has highlighted the fact that this sector is characterized by a diversity of fluvial and periglacial landforms that possess a great potential for tourism and sports activities (fig. 7). The results of these researches were synthesized in an inventory and evaluation sheet presented in table 1.

The richness of the periglacial relief carved on the volcanic conglomerates and represented by residual ridges, peaks and slopes is an important resource for climbing activities.

The location of rocky steeps is linked to the morphogenetic processes that have shaped the pre-existing topography, which distinguish itself through:

- rocky steeps located near the riverbed of Bistriţa Ardeleană River (Gura Şoimu-Gura Repedelui), which is characterized by variable sizes (3-20 m high);

- rocky steeps located near the secondary rivers (Şoimu de Jos, Şoimu de Sus, Stegea, Repedele);

- rocky steep located near the County Road 173 A, wich is characterized by cariable sizes (3-15 m high), but accessible;

- rocky steeps located near the forest road on the secondary valleys (3-20 m high);

- rocky steep located on the residual slopes bordering the rocky ravines and the rocky formations (3-5 m high);

- rocky steeps located on the flanks of residual ridges, with big sizes (10-30 m), but less accessible;

- rocky steeps located on the flanks of residual peaks (Piatra Mare, Şoimu, Stegea, Repedele), which is characterized by big sizes (20-50 m) and difficult access.

Petrographic composition of the volcanic agglomerates (fly ash, sand, gravels, blocks) reflecting on the morphology of rocky walls and thus in the process of climbing, because the rocky prominences and cracks represent natural insurance points.

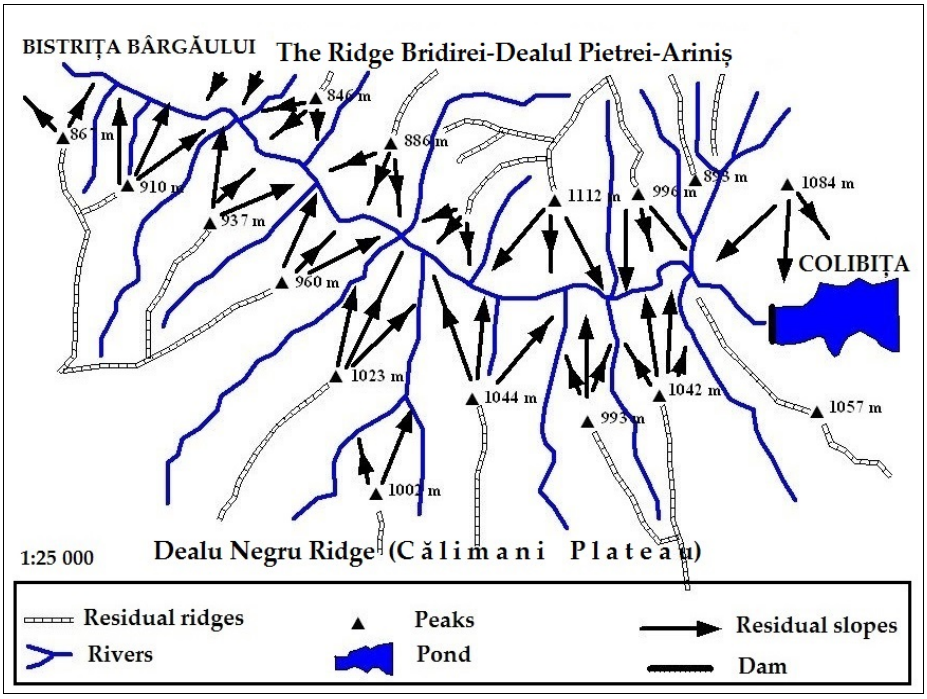

Fig. 7. The functional geomorphological units in Bistrița Ardeleană Gorge

Table 1.

Inventory and assessment sheet of landform of Bistriţa Ardeleană Gorge for sport tourism activities

Landforms type	Localization	Potential for sport tourism	Planning actions
Riverbeds	Main river (Bistriţa Ardeleană), secondary rivers (Moise, Arşiţa, Şoimu, Stegea, Pârâul Pietrei, Repedele)	Ghyll scrambling, rock hopping, canyoning	Tourist marks, tourist indicators, information boards, stopover points
Rocky walls	Main valley, secondary valleys	Free climbing, sport climbing, bouldering, rappelling	Climbing marks, information boards
Residual slopes, residual ridges	Main valley, secondary valleys	Scrambling, free climbing, bouldering, rappelling, via ferrata	Tourist marks, tourist indicators, information board
Floodplains	Main valley (i.e. Poiana Stegea)	Camping, stopover points	Accommodations, car parking
Terraces	Main valley (Poiana Stegea, Gura Şoimu, Gura Repedelui)	Camping, bike competition (Trial, Dual Slalom, Dirt Jumping)	Bike park, accommodations, stopover points
Valleys	Bistriţa Ardeleană, Şoimu, Stegea, Repedele	Hiking, mountain biking (cross country, downhill)	Trails, tourist marks, stopover points, observation towers

Thus, on the face of rocky steeps there can be seen:

- surfaces with roughness (gravels, blocks); surfaces with step and terraces; surfaces with holes;

- surfaces with edges and corners; smooth surfaces; surfaces with cracks; surfaces covered with moss and bushes.

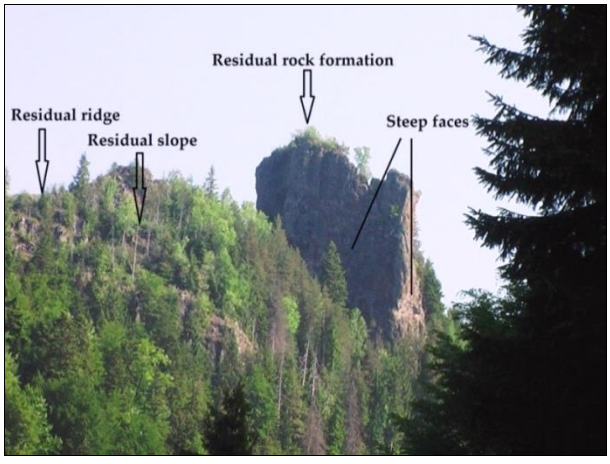

Fig. 8. Residual landforms in the Şoimu Valley

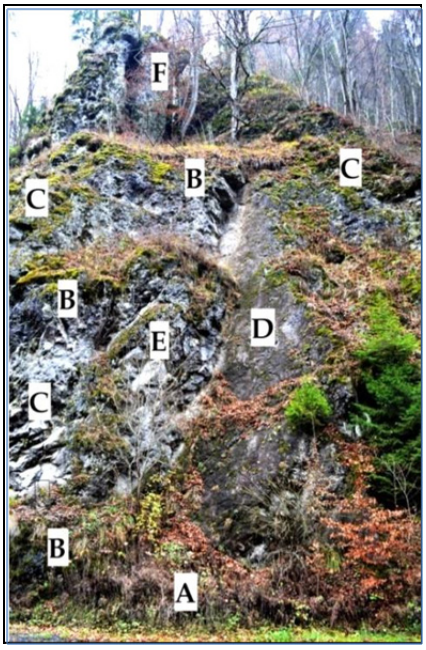

Fig. 9. The micromorphology of a rocky wall for climbing
A-debris slope; B-grassy terrace; C-proeminent rocky surface; D-flat surface;
E-rocky step; F-crack

According to these parameters, the cliffs, slopes and residual ridges are favorable for climbing activities (free climbing, bouldering), rappelling, tyrolean traverse and scrambling. The difficulty of the routes registered is as follows**:**

-1A/B: light trails, which requires no special equipment (small cliffs, residual slopes, rocky prominences and the ravines in the vicinity of creeks and roads);

-2A/B: trails least difficult, requiring equipment and technique for climbing (higher steeps, deep ravines and the slopes under the peaks or residual rocky formations);

-3-8A/B: trails more difficult, and very difficult, requiring physical condition, technical training and equipment (large cliffs, with angles between 45-90^0, located under the residual ridges and under large rocky formations).

Due to the composition of stream beds (gravels, blocks) and the riverbeds morphology (steps, rapids, waterfalls), the main valleys (Bistriţa Ardeleană, Stegea Şoimu, Repedele) and secondary ones (Moise, Arşiţa, Pârâul Pietrei) are favorable for ghyll scrambling, gorge walking, canyoning and rock hopping (fig.10).

Fig. 10. Ghyll scrambling on Şoimu creek

The multitude of forest roads and their morphometry (slope, longitudinal profile, energy) favor the practice of mountain biking (cross country, downhill). The most important paths can include those on the Şoimu, Stegea and Repedele valleys, entering below the peak of Dealu Negru, connecting with magistral route Cuşma-Vulturul-Poiana Cofii-Pănuleţ.

2. Didactic and educational activities

Considering the potential of the Bistriţa Ardeleană Gorge, activities of initiation in sport climbing were held with students and master students from the faculties of Tourism Geography and Physical Education and Sports from the Babeş-Bolyai University-Bistriţa Extension; these activities took the form of internships that have benefited from the support of the Mountain Rescue Service Bistriţa-Năsăud.

To do this, there were established 7 routes with different difficulty gradients, with the average length of 40 meters, easily accessible and located relatively close in two locations. These are:

- the ”Eagle” route-difficulty gradient 6 +;
- the ”Central” route-difficulty gradient 7 +;
- the ”Ladies First” route-difficulty gradient 8 +;
- the ”Rock with the cross” route;
- the ”Polygon” route, location which includes three scholar routes with low difficulty gradient, used in the past for mountain troops training, then rehabilitated by the Mountain Rescue Service Bistriţa-Năsăud, which use it to train the mountain rescuers. Also, this route is easily accessible and used extensively for climbing, and by participants at summer camps mentioned above.

In the teaching process we've addressed primarily to students and students from specializations which through their specific interact deeply with the natural environment, they being the most open-minded regarding the change of mentality in the attitude towards the environment and active leisure.

In this sense, there can be observed an increased presence of summer camps focused mainly on adventure tourism, in which during a week the children are initiated in climbing. Practical activities carried out as a starting point the idea of valorization of the natural potential of the area by organizing activities and sporting events to engage a significant number of participants. The main comparative data refers to the number and categories of participants in this type of practice (table 2, fig.11).

Table 2.

Category and number of participants in the specific activities in climbing carried out in the Bistrița Ardeleană Gorge in accordance with university curricula

Year of study	2011	2012	2013	TOTAL
Students II year Climbing Optional Cours	23	32	40	94
Masters Active Leisure Line	10	18	27	55
Others categories (children, youth)	40	50	70	160
Total	63	100	137	330

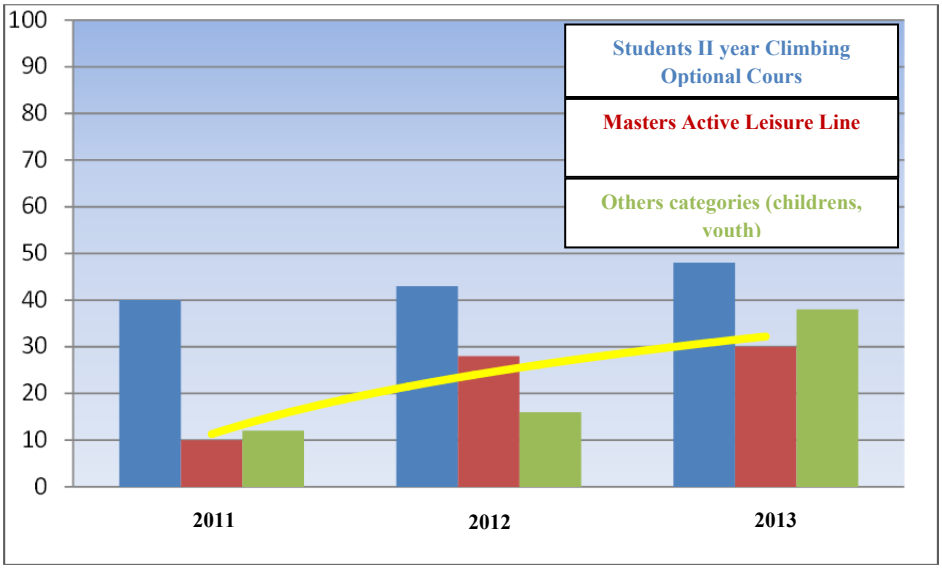

Fig. 11. Comparative graph of the number of participants in the years 2011-2012-2013

According to the recorded data, the following statements can be made: the total number of participants recorded a significant increase in all categories (II year students, master students, other categories of participants); the last item mentioned recorded the highest growth rate because the other two categories are limited to tuition figure; the increase in the number of master students as a result of the emergence of new lines of master from the University Extension Bistrița; other significant items recorded refer to the average age, genre of participants, recording the presence also of those who have previously practiced water activities (table 3, fig.12).

Table 3.

Average age, gender and experience of participants in the climbing program (students, master students, other categories)

Items	Age	M	F	Experience
Students II year Climbing Optional Cours	18-30	32	19	2
Masters Active Leisure Line	23-35	58	10	5
Others categories (childrens, youth)	30-45	50	16	20
Total	18-45	140	45	27

Comparison of these data allow us to affirm: the average age of participants is 18-45 years, the share of male is clearly superior to the female, also the percentage of students with previous experience significant increases in the case of the last two categories which reveal attractive, positive impact on the level of registered participants.

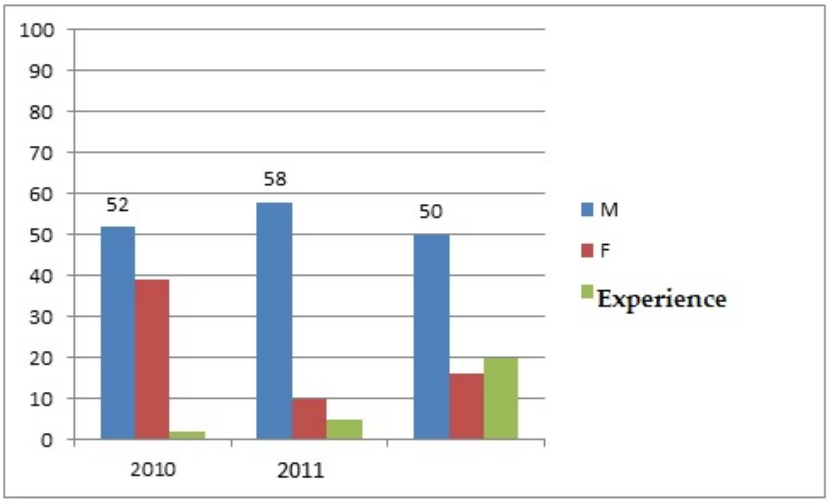

Fig. 12. Graphic comparison of the share of participants in climbing activities

Another form of the active leisure refers to the version of the active and adventure camps focused on initiating/strengthening/improving the technique of climbing to children. This type of activity is organized mainly during school holidays and will be carried out in conjunction with other active mountain practices such as: rafting, cayaking, orienteering, mountain touring (fig.13).

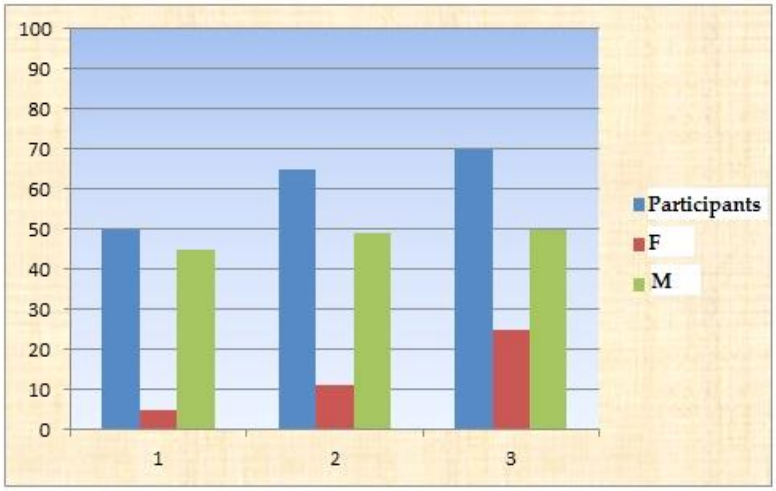

Fig. 13. Comparative graph of the number of participants at Colibiţa Adventures Camps in the period 2012-2013

Selected data reveals growing interest manifested during the period mentioned, a fact highlighted by the increased number of children participating in this kind of activity that must be disclosed the fear manifested by their parents, but also by teachers from these activities (considered dangerous).

Conclusions

The Bistriţa Ardeleană Gorges, through the micro-relief landforms, through easy access (County Road) and through its proximity to the centers that provide tourists (Bistriţa, Prundu Bârgăului, Colibiţa) is a representative tourist destination in the County of Bistriţa-Năsăud for travel sports activities such as: hiking, climbing, canyoning, scrambling and mountain biking. At this time, in this area (Poiana Stegea) there is held the yearly Colibiţa Bike Fest competition, presently at the third edition, which includes several disciplines: dual slalom, trials, dirt jumping and cross country (fig.14).

Fig. 14. Trial contest at Colibița Bike Fest in the Bistrița Ardeleană Gorge

Likewise, this area is used for didactic activities by students and master students from the Faculties of Geography and Physical Education and Sport from the Babeș-Bolyai University-Bistrița Extension. For the future, a series of strategic actions for the development and exploitation of this tourist destinations are required, among which we can mention: the marking of hiking, scrambling and mountain biking trails, the placing of directional indicators and informative panels, the marking of climbing routes and their equipment with insurance assets (anchors, hooks), the arrangement of resting places and scenic platforms, establishment of via ferrata routes and their corresponding equipment, fitting bike park in Poiana Stegea, etc., all of which can be included in a theme park of adventure.

The actors involved in these activities are: Local Council of Bistrița Bârgăului commune, Bistrița-Năsăud County Council, the Directorate For Youth and Sport Bistrița-Năsăud, Babes-Bolyai University from Cluj-Napoca by the faculties of Geography and Physical Education and Sports from Bistrița Extension and the service providers in the area.

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