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BABEŞ-BOLYAI



# EDUCATIO ARTIS GYMNASTICAE

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**EDUCATIO ARTIS GYMNASTICAE**

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7th Pandurilor Street, Cluj-Napoca, ROMANIA, Phone: +40 264 420709,

**E-mail: [studia.fefs@yahoo.com](mailto:studia.fefs@yahoo.com);**

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# STUDIA

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STUDIA UBB EDITORIAL OFFICE: B.P. Hasdeu no. 51, 400371 Cluj-Napoca, Romania,  
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## ASSESSMENT THE CAPACITY OF WORKING MEMORY BY COMPLEX MOTOR TASK IN 10-14 YEARS OLD CHILDREN

BALÁZS FÜGEDI<sup>1</sup>, LÁSZLÓ BALOGH<sup>2</sup>, LÁSZLÓ TÓTH<sup>3</sup>, JÓZSEF BOGNÁR<sup>3\*</sup>

**ABSTRACT.** The aim of the present study is to examine motor learning by capacity of working memory, focusing on kinesthetic, visuospatial sketchpad in nonclinical sample of school-aged children with complex motor task. Several researches are examining the capacity of working memory but there is very little study with nonclinical sample using complex motor task in test. The information obtained was intended to provide normative data before studying clinical populations. It can be declared that by quality the retrieval from the LTM is more auspicious than the retrieval from working memory even if the items are in the process of transcription/encoding. The information gathered in working memory did not find enough connections with movement patterns that were previously stored in the LTM, so the retrieval of them was slower and more imprecise. We can state that at the retrieval/reproduction of a maximum 30 seconds long complex set of movements the last items are still in working memory. In case of complex sport movements (as our exercises also were), the recall of the beginning of a set of movements the 30 seconds seemed short time for accessing/encoding the data to LTM.

**Keywords:** *memory, working memory, capacity of working memory, school age, complex motor task*

### Introduction

According to psychological knowledge memory can be divided into three phases (Atkinson et al. 2005, Eysenck & Keane, 1997): encoding (set data's in memory), storage (retain data's in memory) and retrieval (recovery data's from memory).

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<sup>1</sup> University of West Hungary, Savaria Campus, Szombathely, Hungary

<sup>2</sup> University of Szeged, Szeged, Hungary

<sup>3</sup> University of Physical Education (TF), Budapest, Hungary. \*Corresponding Author: bognar@tf.hu

Differentiation of memory system based on phases was published by Atkinson and Shiffrin (1968) at first. But this theory is really based on Ebbinghaus' theory from 1885. According to this the division of memory:

- short term memory (STM): approximately 15-30 sec, primarily acoustic origin, mainly verbal information. Main parameter is the 7+2 chunk rule (Miller, 1956). It means that people can 5-9 items to note. To forget from the short term memory can be two reasons. First is the extruding when the latest information extrudes the oldest from this storage. Second is the eclipse when the repeat is not enough to recall.

- long term memory (LTM): the time limit of this storage is not well define. This phase is based on the short term memory – in point of fact the learned memory. In long term memory information encoding on their mean. Add contents the recording is get better. However the stored information are not ready, should recall them. Error of long term memory when recall is unsuccessful.

However latest and most common theories are accepting the division of memory according this (Baddeley, 2001):

- explicit memory: it means that visualization and recognition, conscious recall of affairs happened in the past the main function of this type of memory (episodic, semantic) – “know what”.

- implicit memory: this type of memory can be catch out in advance particular perception, motor and cognitive assignment, without recall conscious information and experience that can cause improvement in achievement – “know how”.

Types:

- skill (cycling, to bind lace)
- effect of pre-stress (accessibility of information is the result of previous stimulus)
- conditioning (salivation for word “lime”)
- non-associative symptoms (habituation - cannot hear the tick of the clock)

Also the innovation of researches in the area of memory was to apply working memory instead of short term memory (Baddeley & Hitch, 1974). The main question of researches in the area of short term memory that what is the function of different working memory systems in the process of recognition and how does it works (Németh, 2002). It was an important measure that not a single-component, uniform capacity working memory but systems are mentioned. Further connected question these systems' study, which can offer useful help when examining the recognition background of working memory. Namely the capacity of working memory notably dependent on age (Németh, 2002).

Innovation of Baddeley's working memory model (Baddeley & Hitch, 1974) was that the short term memory is a multiple-component, active and dynamic system in which not only stores the information but operate with them. Working memory is postulated to be composed of a central executive control system monitoring two independent subsystems, visuospatial sketchpad for spatial processing and phonological loop for non-spatial, mainly verbal information processing (Baddeley, 1992). The visuospatial sketchpad liable for the visual and dimensional information storage and the phonological loop liable for verbal information storage. These components are well separated by behavioral and neurobiological methods. In the original model the function of central executive is to harmonize the two peripheries and make connection with long term memory. Among others the central executive is regulate the incoming information to aim of act. Simultaneously work of these subsystems means the working memory (Németh, 2002).

In alternative theories complex working memory are imagined various ways (Gathercole, 1999):

1. a flexible, uniform resource system, which liable simultaneously for storage and manipulating information (Daneman & Carpenter, 1980, Just & Carpenter, 1992);

2. an active part of long term memory which ruled by an inhibition mechanism system (Engle, 1999);

3. a call-stimulus base short memory system, which can access long term memory system structured by special development (Ericsson & Kintsch, 1995).

Development of subsystems of working memory is remarkably different. While the peripheral systems, like the grows of phonological loop's capacity ended sooner, that time systems measured by complex working memory exercises (n-back, reading content) development slower and subtended, representing worse achievement in elder age (Carpenter et al., 1994; Gathercole, 1999). Complexity of working memory and both of the central executive solely and development of it is very hard to define.

There are numerous measurement proceedings to map the verbal working memory like non-word repeating test, number volume, and reading content (Németh 2002). However very few or there are not studies in the visual-dimensional sketchpad and complex motor tasks connection.

The functioning of working memory via the central executive system is suggested to be strongly dependent on the frontal lobes (Baddeley 1996). Studies on nonhuman and human subjects (Fuster, 1989; Funahashi & Kubota 1994; Rypma & D'Esposito, 1999; Martinkauppi et al., 2000) also indicate the importance of the prefrontal cortex in working memory processing.



An age-related improvement has been reported in the performance of a variety of frontal lobe-dependent tasks including working memory, susceptibility to interference, and inhibition of inappropriate responses (Hale et al., 1997; Luciana & Nelson 1998; Luna et al. 2001; Bunge et al., 2002). Working memory in children has also been assessed recently by functional magnetic resonance imaging (fMRI) by use of verbal (Casey et al., 1995) and visuospatial (Thomas et al., 1999; Nelson et al., 2000; Steenari et al., 2001) stimuli. These studies indicate that working memory-related activation in the child brain is of greater magnitude and distributed in a more diffuse manner compared with adult brain, possibly reflecting ongoing maturation and synaptic fine tuning in the child brain (Bourgeois et al., 1994; Casey et al., 2000). Previous research in children has assessed mainly verbal and visuospatial working memory (Casey et al., 1995; Fernández et al., 1998; Luciana & Nelson, 1998; Thomas et al., 1999; Nelson et al., 2000).

Vuontela et al. (2003) examined the effects of age and gender on audio spatial and visuospatial working memory in a nonclinical sample of school-aged children using n-back tasks. They stated that increase in age was related to better accuracy and faster performance in the memory tasks. Boys had shorter reaction times, were less accurate, and made more errors of commission (multiple responses) than girls. These differences between the genders were most evident in the youngest age group (6-8-year olds) and negligible in the oldest age group (11-13-year olds). Visual tasks were performed faster and more accurately than the corresponding auditory ones.

The other interesting side of the working memory researches is the aspects of primacy-recency. Behavioral and neurobiological evidence shows that primacy and recency are subserved by memory systems for intermediate- and short-term memory, respectively. A widely accepted explanation of recency is that in short-term memory, new learning overwrites old learning. Primacy is not as well understood, but many hypotheses contend that initial items are better encoded into long-term memory because they have had more opportunity to be rehearsed (Green, Prepscius & Levy, 2000).

Following a single exposure to learning, recall is better for items at the beginning (primacy) and end (recency) of a list than for middle items. This familiar u-shaped serial position curve is taken as evidence for two distinct memory systems (Glanzer & Cunitz, 1966). By one account (Waugh & Norman, 1965), primacy occurs in a system for long-term memory (LTM), which may maintain information indefinitely, and recency occurs in a system for short-term memory (STM), where unrehearsed information is generally lost in as little as 20 seconds. Accordingly, STM maintains the last few learned items, resulting in recency (Craik et al., 1970). Early list items, which have had the most opportunities for rehearsal in STM, have likewise had the greatest chance to be processed into LTM, resulting in primacy (Rundus, 1971).

Based upon our earlier study (Fügedi et al., 2006), the aim of present study to explore whether the part of working memory (visuo spatial sketchpad) can reproduce the 7+2 items (Miller, 1956) without using phonological support but kinesthetic in a complex motor task? What shows the primacy - recency in an immediate serial recall in motor learning? What are the differences between ages and gender?

## **Material and Methods**

### ***Participants***

A total of 40 children (mean age: 12.38; SD+ 1.213; gender 50-50%) participated in the study. The sampling was carried out with a likelihood random selection among the students of an elementary school from Hungary from 5th to 8th grade (10-10 pupils from each grade). Regular sport activity is taken by 90 % of them. The residual parts of the participants do nothing. Prior to testing, informed written consent was obtained from the parents of the children. It was explained to each child that the experiment could be discontinued at any time. The Ethics Committee of the School approved the study. The procedure was in accordance of ethical standards of human experimentation and with the Helsinki Declaration, revised in 1983. The children were not screened for psychiatric symptoms.

### ***Stimuli***

A general conditioning exercise series was selected due to participants' age, psychological, cognitive and motor maturity. The continuous movement set contains certain 10 elements like certain body position, leaning, circling, and direction changes and static body positions which can be performed by this age group, and which also fulfills the requirements of the National Curriculum. The elements signified the items. The movement set was chosen because it connects elements in the implicit memory storage system, therefore did not cause interference at all. Thus children could focus on reproducing. The presentation was no longer than 30 sec.

### ***Procedure***

Before the examination the aim of the asses was introduced to the children. It was demonstrated clear that after the stimulus they have to make the retrieval immediately. The movement sequence was presented by one of the author of this article and children had to do along with him. Only visual guidance without verbal instructions was used to exclude the phonological loop but assess the effect of kinesthetic. After the presentation the pupils had to reproduce the sequence in immediate serial recall. The movement sequence demonstrated

by the students was recorded by a video camera, installed 5 meters away from the performance. Children took a sit back to the presentation to exclude the visual learning.

### ***Data analyses***

Three sets of analyses were performed. The first analysis included the 10 items to characterize the sample errors and to account for the general errors of the participants. Both descriptive and analysis of variance (ANOVA) were performed to explore the achievement and effect of capacity of working memory. The significance level was set at the alpha level  $p < 0.05$ . If the ANOVA gave a significant main effect, post hoc analyses were performed with Tukey HSD test. The effect of age was analyzed by treating it as a continuous variable and within four subgroups, too (10-11, 12, 13 and 14 year olds).

In the second analysis also the descriptive and analysis of variance (ANOVA) with Tukey HSD post hoc test were used to determine the cut point of continuity of retrieval and asses primacy and recency effect on working memory in the 10-item sequence.

In the third analysis we used descriptive and non-parametric Kruskal-Wallis test using scale data's (5 point) evaluating the items to discover the effect of gender, age and grade on quality of working memory and to explore the primacy-recency effect.

Quantitative and qualitative data were processed with the use of SPSS 18.0 for Windows software.

## **Results**

Examining the capacity of working memory results show that from a 10-item complex motor task sequence children could retrieve the 7 + 2 items (Table 1, Figure 1).

**Table 1.** Successful items

Item	Frequency	Percent
5	9	22,5
6	12	30,0
7	4	10,0
8	6	15,0
9	8	20,0
10	1	2,5
Total sample(n)	40	100,0

In Table 1 can see that successful recall from working memory is 5 to 9 items (97,5%). Figure 1 shows the descriptive statistic of items (M: 6,88; SD +1,556) and we can state that capacity of working memory in serial recall is 7+2 with a bit rounding.

There were no differentiation in gender ( $F=1,258$ ;  $df:1$ ;  $p<0,269$ ), grades ( $F=1,999$ ;  $df:3$ ;  $p<0,132$ ), age ( $F=1,263$ ;  $df:4$ ;  $p<0,303$ ), subgroups of age ( $F=1,152$ ;  $df:3$ ;  $p<0,341$ ) in the achievement of working memory.

In second analysis the cut point of continuity of working memory and output of items were examined to explore the effect of primacy – recency (Table 2, Figure 2)

**Table 2.** Errors in continuity

Item	Frequency	Percent	Valid Percent
first item	8	20,0	20,5%
second item	4	10,0	10,3%
fourth item	1	2,5	2,6%
fifth item	22	55,0	56,4%
sixth item	2	5,0	5,1%
seventh item	2	5,0	5,1%
Subtotal	39	97,5	100,0%
Missing data	1	2,5	
Total	40	100,0	

Nevertheless the expectation the recall of 1st and 2nd item was not so successful (Table 1). In this case the error of items were 20,5% and 10,3%. The most failure item was the 5th item (56,4%) in the middle of sequence (Table 2, Figure 2). However the end of the sequence produced good results. The missing data means that one person could do the sequence without errors.

Assessing the gender ( $F=0,28$ ;  $df:1$ ;  $p<0,868$ ), age ( $F=2,239$ ;  $df:4$ ;  $p<0,85$ ), subgroups of age ( $F=2,636$ ;  $df:3$ ;  $p<0,65$ ) there were no significant differences. At the same time a significant difference was detected in grades (Table 3) between the 6th and 8th grade. The 6th grade execute errors sooner (M=3,10; SD +2,025) than the 8th grade (M=5,33; SD +1,000).

**Table 3.** ANOVA of grades

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	27,000	3	9,000	2,890	,049
Within Groups	109,000	35	3,114		
Total	136,000	38			

## Tukey HSD

(I) Grades	(J) Grades	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
5. grade	6. grade	,400	,789	,957	-1,73	2,53
	7. grade	-,700	,789	,812	-2,83	1,43
	8. grade	-1,833	,811	,127	-4,02	,35
6. grade	5. grade	-,400	,789	,957	-2,53	1,73
	7. grade	-1,100	,789	,512	-3,23	1,03
	8. grade	-2,233*	,811	,044	-4,42	-,05
7. grade	5. grade	,700	,789	,812	-1,43	2,83
	6. grade	1,100	,789	,512	-1,03	3,23
	8. grade	-1,133	,811	,509	-3,32	1,05
8. grade	5. grade	1,833	,811	,127	-,35	4,02
	6. grade	2,233*	,811	,044	,05	4,42
	7. grade	1,133	,811	,509	-1,05	3,32

\* The mean difference is significant at the .05 level.

In the third analysis we used a 5-point scale to evaluate the items. 1 mean the worst, 5 mean the best rate. Table 4 shows the results of descriptive statistic of items. It can be seen that from the 1st item to the 8th item a relatively high performance characterized the achievement. However the last two items issue lower achievement.

**Table 4.** Statistic of achievement of items

Item	Mean	Std. Deviation	Variance
1	4,19	,738	,544
2	4,47	,609	,371
3	4,33	,676	,457
4	4,74	,505	,255
5	4,33	,816	,667
6	4,15	,675	,455
7	4,06	,639	,408
8	4,20	,645	,417
9	3,97	,981	,963
10	3,94	1,014	1,028

To explore the primacy – recency effect in working memory by quality, a non-parametric (Kruskal-Wallis) test was applied. Table 5 and 6 shows the differences in quality of the beginning and the end of sequence by gender. Boys achieve better than girls.

**Table 5.** Test statistics<sup>a,b</sup>

	<b>First item</b>	<b>Ninth item</b>	<b>Tenth item</b>
Chi-Square	3,976	10,322	12,792
df	1	1	1
Asymp. Sig.	,046	,001	,000

a Kruskal Wallis Test

b Grouping Variable: Gender

**Table 6.** Differences by gender

<b>Item/girls</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Variance</b>
1	3,94	,680	,463
9	3,36	,929	,863
10	3,31	,873	,763
<b>Item/boys</b>			
1	4,44	,727	,529
9	4,53	,640	,410
10	4,56	,727	,529

There were no differences by grades neither of 4th to 8th but in age (Table 7, 8) and subgroups of age (Table 9, 10) in the 10th item. In the statistic both age and subgroups of age the 13 year group effect the lowest and 10-11 year group the highest achievement.

**Table 7.** Test Statistics<sup>a,b</sup>

	<b>Tenth item</b>
Chi-Square	11,554
df	4
Asymp. Sig.	,021

a Kruskal Wallis Test

b Grouping Variable: Age

**Table 8.** Differences by ages

<b>Tenth item</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Variance</b>
10 year (1 sample)	5,00	.	.
11 year	4,50	,527	,278
12 year	3,73	1,009	1,018
13 year	2,80	,447	,200
14 year	4,20	1,304	1,700

**Table 9.** Test Statistics<sup>a,b</sup>

	<b>Tenth item</b>
Chi-Square	11,241
df	3
Asymp. Sig.	,010

a Kruskal Wallis Test

b Grouping Variable: Subgroups of age

**Table 10.** Differences by subgroups of age

<b>Tenth item</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Variance</b>
10-11 year	4,55	,522	,273
12 year	3,73	1,009	1,018
13 year	2,80	,447	,200
14 year	4,20	1,304	1,700

## Discussion and conclusions

Our results are similar to the theory of Miller (1956) concerning the capacity of working memory. It seems that the 7 + 2 unit capacity of working memory is partially applies to learn complex sport movements. There were no significant differences between genders, grades and ages.

The 5th item was the most unsuccessful that could be stated from the continuity of the exercises, and although the effect of primacy was manifested, it was weaker than the effect of recency. There were no surpassing results of the reproduction of the items at the beginning of the exercises (1st and 2nd item), because they were not accessing to the LTM. This is an interesting result, because the presentation of the exercises was not longer than 30 sec, and after that, we asked for immediate retrieval repetition without any practice. Two different explanation were formed on the grounds of the above mentioned.

One of the explanations is that in the case of retrieval motor exercises the 15-30 second storage time that applies to working memory is not enough for encoding. Encoding motoric visual pictures is a complicated procedure; working memory has to “try several times” to organize it to an easily retrievable pattern for the LTM.

The other explanation is that storing movements with different levels of difficulty have different storage time in working memory. According to that, in case of complex sport movements (as our exercises also were), the recall of the beginning of a set of movements the 30 seconds seemed short time for accessing/encoding the data to LTM. Further attempts are needed for examining the time of temporary storage and transcription of the first couple items of different movements from working memory.

The reproduction of the last couple items (9th and 10th) at the end of the exercises affirms the recency effect, so the retrieval from working memory was successful as it was also confirmed by our results. On the grounds of the above, we recon that at the retrieval/reproduction of a maximum 30 seconds long complex set of movements the last items are still in working memory. There were no difference between the genders at the examination of primacy and recency effect in the continuity of the movements, but there are statistically demonstrable differences between the ages, as between grades (6th and 8th grades). The 6th grade commits errors sooner at the retrieval of the exercise comparing to other grades. Younger students have already made errors at first couple items during the retrieval of the movements. This has supposedly two reasons, one is that they are inexperienced in learning set of movements, and the other is that their frontal lobe is still developing in this age, so this means that the maturity of regulatory mechanism influences the capability of learning sport movements.

In the course of quality evaluation of the items of the movements we can draw the following inference: retrieval from working memory reflects weaker result, than retrieval from LTM or retrieval of elements in the phase of transcription. It is noticeable that the last two items (9th and 10th) of the set of movements are still in working memory fall far behind the other items quality-wise. Presumably, the adaptation of the new stimuli engage the processor function of the central nervous system and this procedure – forming new movement models or altering/overwriting similar old movement pictures – is time demanding. It is important to note that during the quality evaluation of the primacy and recency effects the boys did better (Table 5 and Table 6). They not only were significantly more successful at performing the beginning of the movements, but also at the last items (9th and 10th) regarding the quality. We think that the reason of the difference between the efficiency is the more favorable movement learning background of the boys (they were more motivated and had more versatile experiences in sports than girls).



There were no differences at the quality evaluation between the grades, but there were statistically significant differences between ages and age groups in the case of the execution of the 10th item. The execution of the exercises within the 13-year old group were the most unsuccessful, followed by the 12- and 14-year old, and quite striking that the efficiency of the 10-11-year old group was the most successful. On the grounds of the above, it can be stated that younger age groups show better quality results at the retrieval of the end-of-the-list items from the working memory than the older age groups. The 13-year old age is a breaking point considering the reproduction of the last items of the exercises in case of the quality appraisal. This coincides with our previous result as the performance of the 6th grade (13 years old students) in continuity showed the weakest result. Efficiency differences between age groups interpreted as motivation reasons. Adolescence is the period of remarkable changes in all aspects, when physical and psychical procedures canalize and restructure. It is vital to develop a high level movement learning skill at this age in the point of posterior motoric achievement.

As the summary it can be stated that the transcription of the first items to the LTM is in process, but it needs more time for consolidation. It is easy to retrieve motoric information from working memory. At the quality evaluation the reproduction of the last items did not show as successful results as the items at the beginning of the movements. It can be declared that by quality the retrieval from the LTM is more auspicious than the retrieval from working memory even if the items are in the process of transcription/encoding. Presumably there are connections between the newly learnt movements and the patterns of previously acquired similar movements. During the process of learning, small alterations took place so these movements became easily recallable. The information gathered in working memory did not find enough connections with movement patterns that were previously stored in the LTM, so the retrieval of them was slower and more imprecise.

Our further study aims that with forming blocks of motoric information we elaborate strategies to different sports that efficiently support the movement learning capacity of competitors.

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## METHODOLOGICAL ISSUES CONCERNING THE PRACTICE OF WEIGHT TRAINING IN GYMS OF CLUJ-NAPOCA: DENSITY WORKOUT

REMUS-CRISTIAN VĂIDĂHĂZAN<sup>1</sup>, IACOB HANȚIU<sup>1</sup>,  
NICOLAE HORĂȚIU POP, COSMIN PRODEA<sup>2</sup>

**ABSTRACT.** Correct planning of physical activities ensures efficiency and reduces the risk of injury due to excesses. Many people have the erroneous impression that you always need high intensity workout in order to develop your body (Wilmore & Costill, 1999). Planning the density of your workout, along with other effort's parameters, plays an important role in the success of weight training workouts. The major objective of this study was the analysis of workout density from the methodological standpoint. This workout density was assessed including people who participated at weight training during their leisure time. As a secondary objective, we built a benchmark index for objective quantification of workout density that is specific for weight training. The vast majority of practitioners have included in their training sessions a number of exercises between 6 and 10 (61.25%) and a number of sets between 11 and 40 (88.75%), with the highest percentage between 21 and 30 sets (36.25%). The density of sets per exercise was calculated by reporting the number of sets to number of exercises. We have thus obtained a set/exercise index (Is/e) between 1.25 and 5.75. Comparing the overall duration of each workout to the number of sets we obtained a density per workout index (IDA) between 0.75 and 9.

**Key words:** *fitness, weight training, exercise, density, workout.*

**REZUMAT.** *Aspecte metodice privind practicarea antrenamentului cu greutate în sălile de fitness din Cluj-Napoca: densitatea în programul de antrenament.* Planificarea corectă a antrenamentului cu greutate asigură eficiență în pregătire și reduce riscul accidentărilor. Multe persoane au impresia eronată că în aceste antrenamente este nevoie mereu de intensități ridicate și volum de lucru mare pentru a dezvolta organismul (Wilmore & Costill, 1999).

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<sup>1</sup> Babeș-Bolyai University, Cluj-Napoca, Faculty of Physical Education and Sport

<sup>2</sup> Babeș-Bolyai University, Cluj-Napoca, Faculty of Psychology and Educational Sciences

\* Corresponding Authors: [vaidahazan@gmail.com](mailto:vaidahazan@gmail.com)

Planificarea densității efortului joacă, alături de ceilalți parametri ai efortului, un rol important în reușita programelor de antrenament cu greutate pentru populație. Obiectivul major al acestui studiu reprezintă analiza din punct de vedere metodic a densității ședințelor de antrenament cu greutate la populația care participă la acest tip de activitate fizică în timpul liber, în sălile de fitness. Ca obiectiv secundar este propunerea unui indice de referință pentru cuantificarea obiectivă a densității efortului specifică antrenamentului cu greutate practicat în sălile de fitness. Marea majoritate a practicanților și-au inclus în ședințele de antrenament un număr de exerciții cuprins între 6 și 10 (61,25%) și un număr de seturi cuprins între 11 și 40 (88,75%), cu procentul cel mai mare între 21 și 30 de seturi (36,25%). Densitatea de seturi pe un exercițiu a fost calculată raportând numărul de seturi din partea fundamentală la numărul de exerciții din partea fundamentală. Am obținut, astfel, un indice set/exercițiu (Is/e) cuprins între 1,25 și 5,75, cu unitate de exprimare în „seturi/exercițiu”. Raportând durata totală a fiecărui antrenament la numărul de seturi din partea fundamentală am obținut un indice de densitate pe antrenament (IDA) cuprins între 0,75 și 9. Acest indice are ca unitate de exprimare „minute/set”.

**Cuvinte cheie:** *fitness, antrenament cu greutate, efort fizic, densitate, program antrenament.*

## Introduction

A weight training program is a composite of several variables that can be combined in a variety of choices to get the desired effect (Ratamess Jr., 2012). The identification of these variables and their proper planning is essential to predict a beneficial outcome for weight training workouts (American College of Sports Medicine, 2007). Correct planning of physical activities ensures efficiency and reduces the risk of injury due to excesses. "Top fitness is mandatory for shaping the heart of a future champion but not the heart of a future octogenarian. That is, a future champion needs the full cardiac adaptation of the peak training effect, whereas a future octogenarian needs healthy coronary arteries" (Sharkey, 1988, p. 5).

Many people have the erroneous impression that you always need high intensity workout in order to develop your body (Wilmore & Costill, 1999). Planning the density of your workout, along with other effort's parameters, plays an important role in the success of weight training workouts.

The density can be defined in terms of the ratio of exercise duration and length of the rest that follows that effort. A practical approach in relation to the density in weight training workouts is the number of exercises included in your training sessions related to training duration or number of sets per time unit.

The amount of energy consumed during weights exercises and energy systems involved in the muscle contraction are directly related to exercise intensity and duration of sets (Bompa, 1995). Including multiple sets for an exercise requires optimal choice of rest interval between them. The rest between sets has the role to allow the body to achieve adequate recovery before the next set. Time of rest interval has a significant impact on the performance and on the force development through weight training workouts (Pincivero, 2001).

The time spent to recover between sets will influence the extent of replenishment for energy reserves until a new set is performed. According to Pincivero (2001), after an execution of a set, almost half of creatine phosphate deposits recover between 1 and 3 minutes, but full recovery may take up to 6 minutes, sometimes even more. Implications of break duration on restoring energy deposits in weight training are (after Bompa, 1995, p. 72):

- A 30 seconds break between sets enables the recovery of creatine phosphate deposits at a rate of about 50%;
- A one-minute break between sets is not sufficient to fully restore muscle resources when running multiple sets of 15-20 repetitions per set;
- A pause of 3-5 minutes or more, sometimes, allow entirely recovery of creatine phosphate deposits.

Thus, the shorter the interval between sets the harder creatine phosphate reserves will be restored. With longer interval between sets, greater weights can be used in the next set (Ratamess Jr., 2012) or the number of repetitions performed with the same weight (Richmond & Godard, 2004; Willardson & Burkett, 2006; quoted by Ratamess Jr., 2012, p. 211). Rest interval between sets directly influence the performance of each set (American College of Sports Medicine, 2007). "Greatest reductions in performance were seen with 30-second rest intervals and performance was maintained the best with 5-minute rest intervals" (Ratamess, Falvo, Mangini, Hoffman, Faigenbaum & Kang, 2007; cited by Ratamess Jr., 2012, p. 211), and muscular development was higher using rest intervals of two to three minutes instead of 30-40 seconds (Ratamess Jr., 2012).

Other factors influencing the planning of rest between sets in weight training are: desired anatomical adaptations of the workout, fitness levels and experience of trainee, the complexity of exercise and the number of muscles involved in performing the exercise, muscle size involved in the execution of exercise and the time necessary to move from one machine to another in fitness gyms (Ratamess Jr., 2012).

In weight training, depending on the objectives followed, we can opt for complete recovery or incomplete recovery between sets, but tolerance of the trainee to increasingly shorter rest intervals develops over time. It is mandatory to choose rest intervals that are consistent with the individual's level of training and with its general physical condition, since the accumulation of lactic acid and its removal is directly influenced by previous training.

## Objectives of the study

The major objective of this study was the analysis of workout density from the methodological standpoint. This workout density was assessed including people who participated at weight training during their leisure time. We analysed the number of exercises in the workout, the number of sets per exercise, and the rest intervals proposed by practitioners in the beginning of workout compared with the real rest intervals measured by researcher during workout.

As a secondary objective, we built a benchmark index for objective quantification of workout density that is specific for weight training.

## Materials and methods

The research was conducted from 14 August 2013 to 20 August 2014 in Cluj-Napoca's weight training gyms. The subjects are practitioners of all gyms where weight training is done, and where we were granted access. We registered between 4 and 6 practitioners in every gym. 155 practitioners were interviewed. 47.74% refused participation to our study, and 52.26% accepted permission. A practitioner didn't use weights in the day that we recorded his workout. Total number of registered subjects (subjects who used specific weight training exercises) was 80 (51.61% of respondents). To build the sample we used a non-random sampling as a member of the population probability of being selected in the sample could not be determined. For each of the 80 subjects was recorded only one session of training.

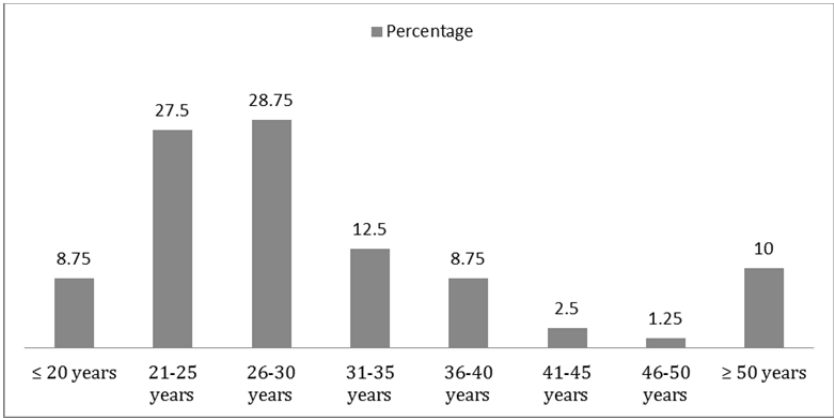
The data needed for research were recorded on a sheet of observation before and during the workout. The items recorded were: workout time, number of weight exercises, number of sets in the workout, rest intervals proposed by practitioners and rest intervals recorded by us.

## Results

Of the 80 subjects 68.75% (55 subjects) were male and 31.25% (25 subjects) female, aged between 18 and 60 years. We present in Table no. 1 a distribution of subjects on age levels. In Chart no. 1 it can be seen percentages on age levels for our subjects.

**Table 1.** Distribution of subjects by age levels

	≤ 20 years	21-25 years	26-30 years	31-35 years	36-40 years	41-45 years	46-50 years	≥ 50 years
Subjects	7	22	23	10	7	2	1	8
Percentage	8.75	27.5	28.75	12.5	8.75	2.5	1.25	10



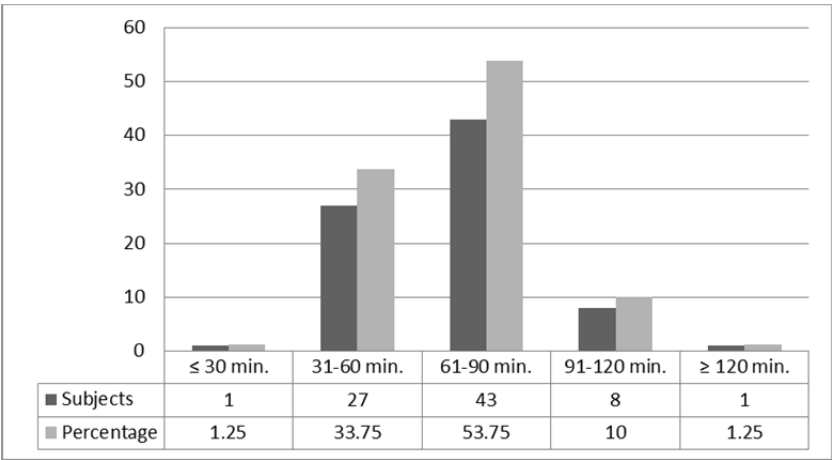
**Fig. 1.** Distribution of subjects by age levels

Levels of education (completed studies) are shown in Table no. 2.

**Table 2.** Distribution by level of education

	Gymnasium	High School	Faculty	Master
Subjects	6	25	28	21
Percentage	7.5	31.25	35	26.25

The registered workout time was between 26 minutes and 133 minutes, with an average of 70.05 minutes. In Chart no. 4 it can observe the workout time distribution.

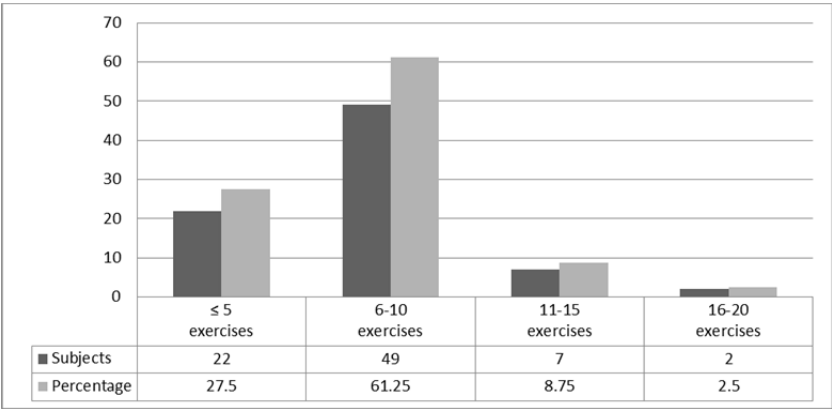


**Fig. 2.** Workout time distribution



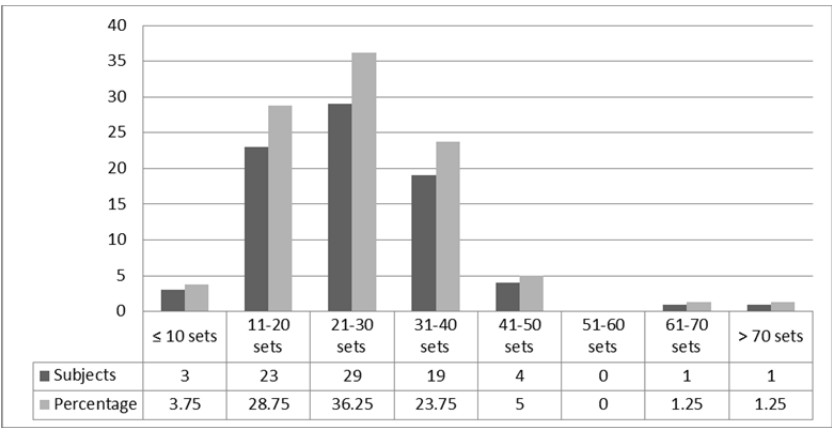
In all the 80 workouts we counted only those exercises that are specific to weight training. We excluded cardio exercises (treadmill or bicycle). We counted also the number of sets, even if they were used as warm-up sets.

Minimum number of exercises in a training session was 3 and the maximum was 18. Chart no. 3 presents a distribution for exercises used.



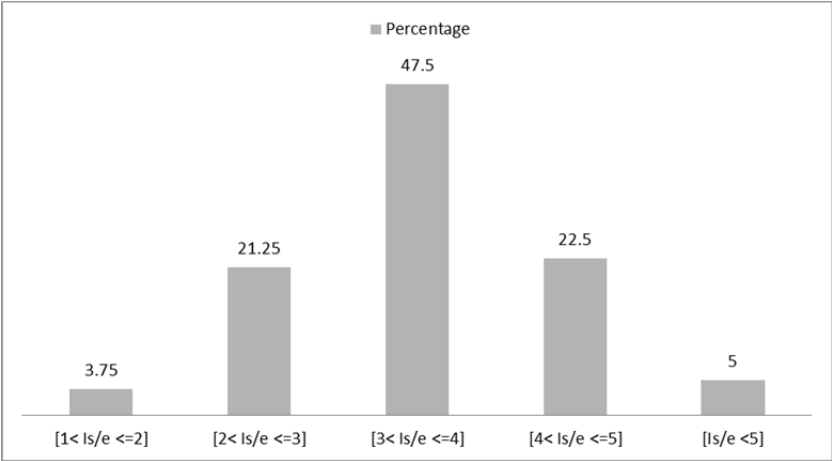
**Fig. 3.** Distribution of exercises number

The minimum number of sets in training sessions was 10 and the maximum was 73. In Chart no. 4 we can observe this distribution.



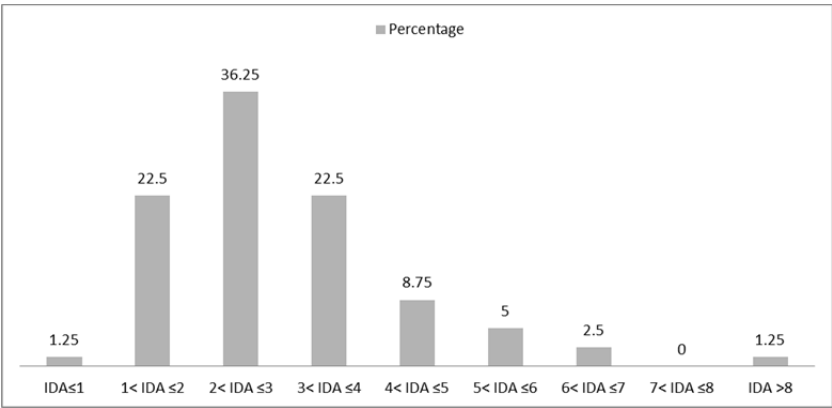
**Fig. 4.** Distribution for sets used in training

The density of sets per exercise was calculated by reporting the number of sets to number of exercises. We have thus obtained a set/exercise index ( $I_{s/e}$ ) between 1.25 and 5.75. Staggering levels can be tracked the Chart no. 5.



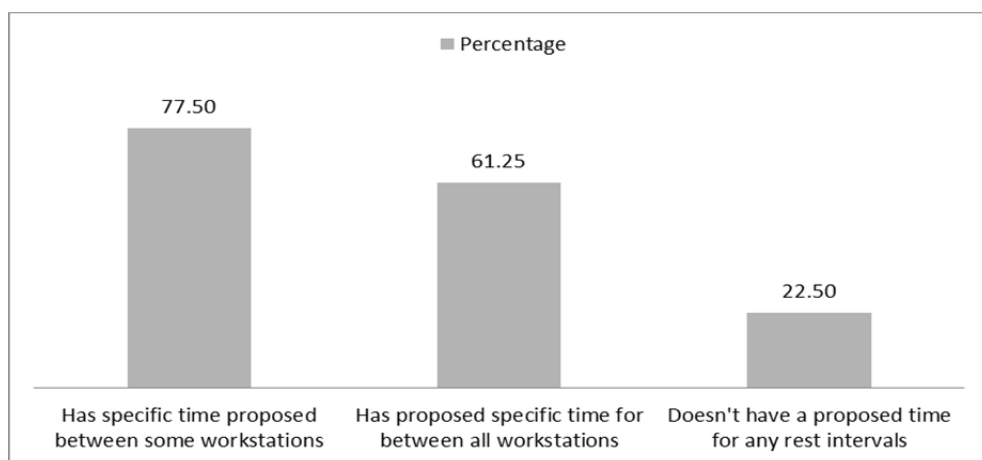
**Fig. 5.** Distribution of set/exercise index

Comparing the overall duration of each workout to the number of sets we obtained a density per workout index ( $I_{DA}$ ) between 0.75 and 9. Chart no. 6 shows the distribution of this index.



**Fig. 6.** Distribution of workout density index

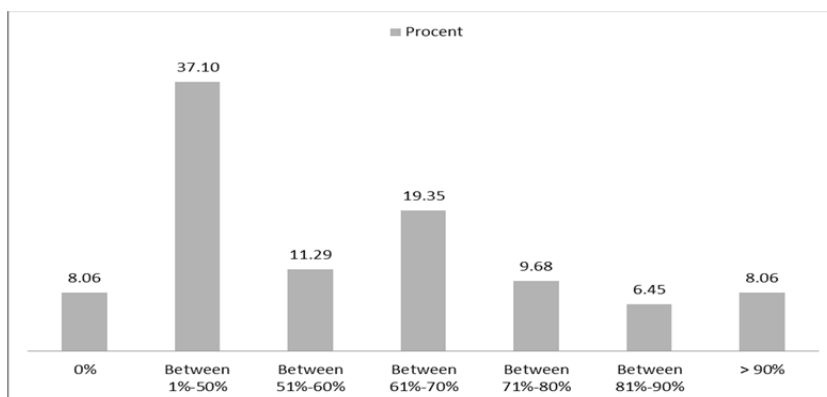
Regarding the rest intervals that practitioners have proposed between exercises and between sets, it varied between 0 and 300 seconds between exercises and from 0 to 180 seconds between sets. Not all practitioners have proposed to follow a precise rest between workstations. Of the 80 practitioners in the study only 77.50% have set exact time for rest intervals only for some workstations of their workouts. Only 61.25% of practitioners have proposed specific time for their rest intervals between all of their workstations in the training session, and 22.50% have not proposed a specific time for rest intervals. Chart no. 7 shows this distribution.



**Fig. 7.** Specific rest intervals between workstations

Minimum suggested duration for rest intervals between workstations, measured by us, was between 1 second and 109 seconds. The maximum duration of rest intervals between workstations, measured by us, ranged between 80 seconds and 667 seconds.

Of the 62 practitioners (77.50%) who proposed specific rest interval between, at least, some workstations only five practitioners (8.06%) were able to meet the proposed rest intervals for more than 90% of their intervals (see Chart no. 8). If we compare the number of practitioners who have succeeded to meet previously proposed rest intervals to the total number of registered subjects, the percentage of those who have exceeded the 90% of their rest intervals is lower, only 6.25%.



**Fig. 8.** The percentage of rest intervals that were met

## Discussions

Practitioners have completed their weight trainings between 26 minutes and 133 minutes, with an average of 70.05 minutes. It is found that over 50% of practitioners had workouts with weights between 61 and 90 minutes. 87.50% of the subjects were trained between 31 and 90 minutes. American College of Sports Medicine (ACSM) recommends for most participants in physical activities training workouts between 20 and 60 minutes (American College of Sports Medicine, 1990). Many practitioners have found that 20-30 minutes of weight training combined with 20-30 minutes of cardio is a productive combination to achieve optimum levels of fitness (Westcott, 1996).

The vast majority of practitioners have included in their training sessions a number of exercises between 6 and 10 (61.25%) and a number of sets between 11 and 40 (88.75%), with the highest percentage between 21 and 30 sets (36.25%). ACSM recommends for the vast majority of practitioners the range of 8-10 exercises for weight training sessions (American College of Sports Medicine, 2005). An advanced training program can include up to 20 exercises for a training session (Baechle & Groves, 1998).

The minimum number of sets per exercise for the highest percentage of subjects was 3 sets/exercise (33.75%). Some of them worked with a minimum of 4 sets/exercise (27.50% of practitioners). These were the first two values, in order of size. As regards the maximum number of sets for an exercise, almost half of practitioners (48.75%) chose to work with 4 sets/exercise. Several studies have shown that the best results, for trained individuals, were obtained when working with a number between 4 and 8 sets for muscle group, while the most effective for beginners are 4 sets/muscle group (Ratamess Jr., 2012).

The index set/exercise ( $I_{s/e}$ ) has not exceeded 5.75, with an average of 3.69. Moreover, many subjects (47.50%) had an index between 3.01 and 4. The interval 2.01-5 is associated with a percentage of 91.25%. The index of workout density ( $I_{DA}$ ) is an index that we propose to compare two weight training sessions. The lower is the value of this index; the higher is the density in weight training session. Many practitioners (81.25%) had an index between 1.01 and 4; the highest percentage (36.25%) was recorded on the level of 2.01 to 3.

Regarding the duration of rest intervals between workstations, it appears that only a proportion of 63.75% worked with rest intervals previously established and the rest (36.25%) hadn't planned the rest intervals between workstations. Of all registered subjects, only 6.25% were able to achieve the rest intervals planned, for a rate of over 90% of their total intervals included in workout.

## Conclusions

1. Most practitioners have a proper approach of total workout time.
2. Number of exercises used in training sessions, for most practitioners, respects the recommendations of literature.
3. Most practitioners work with a number of 3-4 sets per exercise. It is an approach that we have seen in all the gyms where we made measurements.
4. The set/exercise index had an average value of 3.69. For almost half of subjects this index had a value ranged between 3.01 and 4. This means that almost half of subjects have included at least 3 sets for each exercise and not more than 4 sets per exercise.
5. The workout density index had, for a large number of practitioners, values between 1.01 and 4. More than a third of subjects had values ranging from 2.01 to 3.
6. The small number of practitioners who were able to meet the rest intervals planned in advance forces us to conclude that workout density during their sessions is not the one that they have planned. From this point of view, their training sessions lack of quality.
7. A good workout density in weight training involves, as a first step, accurate planning of rest intervals between workstations. For a better density we recommend using a personal stopwatch and a notebook with the planning of whole training session.

## Acknowledgment

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## WEIGHT THROWING TRACK EVENTS SHARE IN FIELD COMPETITION

MARGARETA ANTON<sup>1</sup>

**ABSTRACT. Introduction.** The carry out of track events provides data relating to body state, being necessary to identify deficiencies, to evaluate learning outcomes, to assess the different training stages level, to calculate the effort capacity progress rate, the behavior prognosis and the results from current following competitions. **Hypothesis.** We consider that the statistic correlations as being nonlinear, meaning that veracity of track events depend on the athlete's performances, on the age or training level and lastly by the event itself. **Methods.** I took in to consideration the result at the three weeks track events and correlated it to the result for 8 Romanian National Team man and women throwers contest. In the mathematic – statistic calculation I used the Mathcad software. **Results.** From table of correlation of coefficients between competition results and track events we observe that only the extension, the genuflections, lie down push ups, standing long jump shot put backward and shot put forward are significantly correlated with throwing athletic shot put event. Some events are correlated between them, standing long jumps with 30 m sprint, the extensions and genuflections. The tight correlated events may usually replace each other. From the calculation of nonlinear correlations it results that the replacement between them is possible only for certain performance gaps. **Conclusions.** In management of high performance training in preparation of shot put would to renounce at a series of track events that do not have any relevance with throwing and any relevance in prognosis of the result at the next available competition.

**Keywords:** shot putt, track event, competition, correlation

**REZUMAT. Importanța relației dintre probele de control și proba din concurs la aruncarea greutății. Introducere.** Prestarea probelor de control este necesară pentru a obține informații în legătură cu starea organismului, depistarea unor carențe, controlul evoluției învățării, diagnoza nivelului de pergamire în

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<sup>1</sup> Ecological University of Bucharest.

\* Corresponding Author: margaretabosanceanu@yahoo.com



diferite etape de pregătire, calcularea ratei de progress a capacității de efort, prognoza comportamentului și rezultatelor din competițiile imediat următoare. **Ipoteză.** Considerăm că, corelațiile statistice sunt neliniare, însemnând că veridicitatea probelor și normelor de control depinde de performanța atletului, de vârstă sau nivelul de pregătire și în ultima instanță de de probă. **Metode.** S-au luat în considerare rezultatele la probele de control cu trei săptămâni și s-au corelat cu rezultatele din concurs pentru 4 aruncători și aruncătoare din reprezentativa României. În calculul matematico-statistic s-a folosit softul Mathcad. **Rezultate.** Din tabelul coeficientilor de corelație dintre rezultatele competiționale și probele de control se observă că numai detenta, genuflexiuni, împins culcat, lungime fără elan aruncarea greutății înapoi și aruncarea greutății înainte se corelează semnificativ cu proba atletică de aruncare a greutății. Unele probe se corelează între ele, precum lungime fără elan cu 30m sprint, detenta și genuflexiuni. De regulă, probele corelate strâns se pot înlocui între ele. Din calculul corelației neliniare rezultă că înlocuirea între ele este posibilă numai pentru anumite ecarturi de performanță. **Concluzii.** În managementul antrenamentului de înaltă performanță în pregătirea aruncătorilor de greutate ar trebui să se renunțe la o serie de probe de control care nu au nici o relevanță cu aruncarea și nicio relevanță în prognoza rezultatului la proxima competiție. Aceasta ar conduce la economie a energiei și implicit la o mai rapidă refacere a organismului.

**Cuvinte cheie:** aruncarea greutății, probe de control, corelare, concurs

## Introduction

It is known that in performance sport and especially in high performance sport the carry out of track events is necessary in order to obtain information on the body estate, the detection of deficiencies, the evolution of learning outcomes, the assessment of training level in differed training stages, the calculation of effort capacity progress rate, the behavior prognosis and the results from next scheduled competitions.

The norms and track events consist in some exercises that by their structure, involve the manifestation of movement skills preponderance.

Correlation In statistics, dependence is any statistical relationship between two random variables or two sets of data. Correlation refers to any of a broad class of statistical relationships involving dependence. In probability and statistics, a random variable, random variable or stochastic variable is a variable whose value is subject to variations due to chance (i.e. randomness, in a mathematical sense (Yates, D. S., Moore, D.S., Starnes, D. S., 2003).

The basic concept of "random variable" in statistics is really-valued, and therefore expected values, variances and other measures can be computed. However, one can consider arbitrary types such as Boolean Values, Categorical Variables, complex numbers, vectors, matrices, sequences, trees, sets, shapes, manifolds, functions, and processes.

In statistics, groups of individual data points may be classified as belonging to any of various statistical data types, e.g. categorical ("red", "blue", "green"), real number (1.68, -5, 1.7e+6), etc. Mosteller and Tukey (1977) distinguished grades, ranks, counted fractions, counts, amounts, and balances. Nelder (1990) described continuous counts, continuous ratios, count ratios, and categorical modes of data.

Formally, *dependence* refers to any situation in which random variables do not satisfy a mathematical condition of probabilistic independence. In casual usage, *correlation* can refer to any departure of two or more random variables from independence, but technically it refers to any of several more specialized types of relationship between mean values. There are several correlation coefficients, often denoted  $\rho$  or  $r$ , measuring the degree of correlation. The most common of these is the Pearson correlation coefficient, which is sensitive only to a linear relationship between two variables (which may exist even if one is a nonlinear function of the other). Other correlation coefficients have been developed to be more robust than the Pearson correlation – that is, more sensitive to nonlinear relationships (Dietrich, C. F., 1991).

## Hypothesis

We consider that the statistic correlations are nonlinear, meaning that veracity of events and event norms are depending on the athlete's performances, on the age or training level and in the last instance by the probe it-self.

## Methods

I took in to consideration the result at the three weeks track events and correlated with the result from contest for 4 throwers man and women from Romanian National Team. In the mathematic – statistic calculation I used the Math cad software.

*The events and control norms were the following:*

- Speed running (30 m). Measure the speed movement. The athlete leaves at hearing command with standing start. The athlete runs those with maximum

intensity speed 30 m. The race is made without special shoes (without nails). Is running two times and is denoted the best result. The result is measured in seconds and splits seconds;

- Speed running (50 m). Measure the speed movement. The athlete leaves at hearing command with standing start and those 50 m are runs with maximum high speed. The race is made without special shoes. Is running one only time and the result is denoted. The athletes runs one by one or by two (in pairs).

- Standing long jump. Measure the explosive force of the lower limbs. Standing with the feet slowly apart behind the line, with balance of the arms and a slowly flexion of the feet is jump as far away as. The result is measured from the line till the last sign let on the ground to the inside. The test is executed two times and is denoted the best result in meters and centimeters;

- Standing triple jump. Measure the explosive force of the lower limb. Standing with the feet slowly apart, behind the line and with a slowly balance of the arms and a flexion of the feet is made two successive jumps steep and the third with landing into the sand pit hole. The result is measured from the line till the last sign let on the sand to the inside. Is jump two times and is denoted the best result in meters and centimeters;

- Genuflexions. Measure the muscular strength of the lower limbs. With the bar lateral charged with barbell, placed on the scapula-humeral belt is made a complete flexion of a lower limbs, after that follows the complete raise from flexion. The test is made only once and is denoted number of raised kilos.

- Snatched. Measure the explosive force of the upper limbs. It is a complex exercises in which are involved both the arms force and the trunk but also the lower limbs force. Standing with the feet apart before the barbell, is take the bar at the middle with the two hands apart at the level shoulders or usually more. The bar is snatched with the lateral barbell (by the powerful contraction) and is rise on the chest level above the head where is kept 3 seconds. It is denoted the number of raised Kilos;

- Pushed from lying position. Measure the arms muscles force: biceps, triceps, pectoral. Standing laying – down in supine position with the arms strait forward, is raising the bar with charge and execute one complete flexion of the arms till of the chest level after that push the bar again in the initial position. Is noted the number of pushed kilos.

- Shot put forward. Measure the explosive force of lower and upper limbs. From the position standing apart behind the line, the arms stretched is taking the weight and by a half-flexion of a lower limbs is throwing the weight from bottom-forward as far as possible. Is measuring from the line till the nearest sign let on the ground by the weight. Is throwing two times and is noted in meters and centimeters the best result.

- Shot put backward. Measure the explosive force of the muscles, lower limbs, and upper limbs and of a back. Standing with the feet apart at the shoulders level, the weight keeping at a level of metacarpal and phalanges with the back on throw direction by a half-flexion of a lower limb is throwing as far as possible. Is measuring from the line till the nearest sign let on the ground is executed two times and is noted in meters or in centimeters the best throw.

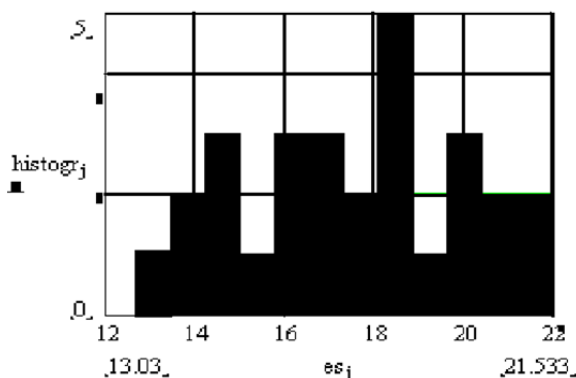
The competition results taken into account were the following:

**Table 1.** Subjects and results

Nr. crt	Name	Date of birth	Sports club	Event	Performance
1	V. A.	1978	CSMCraiova	Shot put	17.51 m (4 kg) m
2	N.I.	1985	C.S.4 Buc.	Shot put	15.05 (5Kg)m
	N. I.	1985	C.S.4 Buc.	Shot put	12.50 (7.260 Kg)m
3	D. Ș.	1983	C.S.4 Buc.	Shot put	13.43 (7.260 Kg) m
4.	M.A.	1985	C.S.4 Buc.	Shot put	18.77 (5 Kg)m
	M. A.	1985	C.S.4 Buc.	Shot put	13.82 (7.260 Kg) m

## Results

From histogram (fig.1) of contest result in shot put event we observe that the incidence of value results is greater than the weaker ones. The explanation would be that the samples are not randomized, the thrower men from the list seem to be selected or the frequency of valuable competitions for analysed period is greater.



**Fig. 1.** The histogram of the contest result in weight throwing event

**Table 2.** Matching coefficients between the competition results and the control trials at shot put.

	Shot Put	Speed running 30m s	Speed running 50m	Standing triple jump	Genuflexions	Pushed from lying down position	Standing long jump	Shot Put forward	Shot Put backward	Standing Shot Put	
	0	1	2	3	4	5	6	7	8	9	10
Shot Put	1	1	n	n	n	.66	.71	.59	n	.67	.78
30m s p	2	n	1	n	n	n	n	.77	n	N	n
50m s p	3	n	n	1	n	n	n	n	n	N	n
Standing triple jump	4	n	n	n	1	n	n	n	n	N	n
Genuflexions	5	.66	n	n	n	1	n	.71	n	N	n
Pushed from lying down position	6	.71	n	n	n	n	1	n	n	N	n
Standing Long jump	7	.59	.77	n	n	.71	n	1	n	N	n
Shot Put forward	8	n	n	n	n	n	n	n	1	.68	n
Shot Put backward	9	.67	n	n	n	n	n	n	.68	1	.66
Standing Shot Put	10	.78	n	n	n	n	n	n	n	.66	1

From table of the correlation of coefficients (Table 2) between competition results and track events we observe that only the extension, the genuflexions, lie down push up, standing long jump, shot put backward and shot put forward are significantly correlated with shot put athletic event. Some events are correlated between them, such as standing long jump with 30 m sprint, and the extension and genuflexions. The events tight correlated may usually replace each other. From the calculation of nonlinear correlations it results that the replacement between them is possible only for certain performance gaps. For example standing long jump and the extension may be replaced each other only for great value exceptional performances. On the contrary, the other applied track events can be less forecasted from the competition result. 30 m, 50 m, standing triple jump, shot put forward.

## Discussions

First of all, the statistic correlations show only two value streams varying in a parallel way or after empirical relations. The causal link does not result from these variations, but only from logical rationale (Gagea, A. 1999).

The choice and the moment of track event performance are empiric, this does not mean they are not correct, but they reflect the experience, the talent and personality of the coaches or those who lead the training process (team – work, federation, club etc.), (Anton, M.2003).

Although it does not result from our data, but may be argued with bibliographic references, it seems that one events series are not adequate of the throwing events in generally, only to certain events. For example 30 m-50 m sprint, triple jump without impulse for any type of throw and weight throwing forward for weight throwing.

## Conclusions

In management of high performance training weight throwers should renounce a series of track events that have no relevance to throwing or to the next scheduled competition result prognosis. This would conduct to saving energy and implicitly to a speedy recovery of the competitors.

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## PILOT STUDY CONCERNING THE LEVEL OF CIVIC SENSE OF STUDENTS IN THE 1<sup>ST</sup> YEAR, PHYSICAL EDUCATION AND SPORTS, KINETOTHERAPY STUDY PROGRAM

ÁLMOŠ ANDRÁS<sup>1\*</sup>, IOAN NICULAIE NEGRU<sup>1</sup>

**ABSTRACT.** In a democratic society citizens should exercise their civic rights responsibly. Also a democratic society is based on fundamental values such as respect for human rights and human dignity, to the Constitution and laws, and willingness to engage in activities that support them; tolerance for individuals and groups who exhibit different values, opinions and beliefs; considering pluralism as a core value of democracy; active involvement in political life and civil society; civic responsibilities (personal, political and economic); to be a well-informed citizen, attentive to public issues ("Programă școlară pentru liceu. Educație civică", 2004). These values and attitudes are learned and internalized by individuals throughout their lives in social groups in which they operate. So in this process materializes in concrete the awareness of these civic values in the daily life of the citizens. In this study the main objective was to highlight the civic responsibility of students from the first year of the Faculty of Physical Education and Sport in Cluj-Napoca. Also we were interested how practicing a sport branches influences the level of civic responsibility. The main research method was the test method, so we used a psychosocial test measuring the level of civic responsibility. (Neculau, A. et al., 1999, p. 79-81)

**Key words:** *physical education, sport, civic sense, students*

**REZUMAT.** *Studiu pilot privind nivelul simțului civic al studenților din anul I, programul de studiu Educație Fizică și Sport și Kinetoterapie.* Într-o societate democratică cetățenii trebuie să-și exercite drepturile lor cetățenești cu responsabilitate. Totodată societatea democratică se bazează pe valori fundamentale, cum sunt: respectul față de drepturile omului și demnitatea umană, față de Constituție și legi, precum și disponibilitatea de a se angaja în activități care le susțin; toleranță pentru indivizi și grupuri care manifestă valori,

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<sup>1</sup> Babeș Bolyai University, Physical Education and Sports Faculty, Cluj-Napoca

\* Corresponding Author: andrasalmos@yahoo.com



opinii și credințe diferite; considerarea pluralismului ca o valoare principală a democrației; implicarea activă în viața politică și societatea civilă; asumarea responsabilităților cetățenești (personale, politice și economice); a fi un cetățean bine informat, atent la problemele publice. ("Programă școlară pentru liceu. Educație civică", 2004) Aceste valori și atitudini sunt învățate și interiorizate de indivizi, pe parcursul întregii vieți, în grupurile sociale în care acționează. Astfel se materializează simțul civic care înseamnă conștientizarea concretă a acestor valori în viața zilnică a cetățenilor. În studiul de față obiectivul principal este de a evidenția nivelul simțului civic al studenților din anul I al Facultății de Educație Fizică și Sport din Cluj-Napoca. Totodată eram interesați de modul în care practicarea unor ramuri sportive poate influența nivelul simțului civic. Metoda principală de cercetare a fost metoda testului, astfel s-a folosit un test psihosocial care măsoară nivelul simțului civic. (Neculau, A. et al. 1999, p. 79-81)

**Cuvinte cheie:** *educație fizică, sport, simț civic, studenți*

## Introduction

We agree with the idea that "the pursuit of equity and social cohesion has been a growing political priority over recent years at" European level ("Citizenship Education in Europe", 2012, p.7). Encouraging young people, "to actively participate in social and political life has been seen as one of the principal means to address these issues; education has, consequently, been identified as a major lever in this aspect" ("Citizenship Education in Europe", 2012, p.7). We uphold that "students learn about citizenship not only in the classroom but also through informal learning. Citizenship education is therefore more effective if it is supported by a school environment where students are given the opportunity to experience the values and principles of the democratic process in action" ("Citizenship Education in Europe", 2012, p.13).

In the Romanian educational system, at high school level curriculum we can find a discipline entitled "Civic education". In our opinion the problem is that this discipline is an optional one and it is at the schools decision to introduce it or not in the high school student's curriculum. In the National Syllabus of high school, Civic education discipline is specified that with three main competences – The foundations of democracy, Politics and democracy and The civil society and its role in democracy – are the foundations in the realization of the values and attitudes for what the civic education stands for. These are respect for human rights and human dignity, to the Constitution and laws, and willingness to engage in activities that support them; tolerance for individuals and groups who exhibit different values, opinions and beliefs; considering pluralism as a core value of

democracy; active involvement in political life and civil society; civic responsibilities (personal, political and economic); to be a well-informed citizen, attentive to public issues. ("Programă școlară pentru liceu. Educație civică", 2004)

In the Europe Union context the notion of "Education for democratic citizenship" stands for "Civic education" in the Romanian context. In EU context "Education for democratic citizenship means education, training, awareness-raising, information, practices and activities which aim, by equipping learners with knowledge, skills and understanding and developing their attitudes and behaviour, to empower them to exercise and defend their democratic rights and responsibilities in society, to value diversity and to play an active part in democratic life, with a view to the promotion and protection of democracy and the rule of law" (Recommendation CM/Rec(2010)7, 2010, p.2). So Education for democratic citizenship "focuses primarily on democratic rights and responsibilities and active participation, in relation to the civic, political, social, economic, legal and cultural spheres of society" (Recommendation CM/Rec (2010)7, 2010, p.3).

In the previous paragraphs we have presented some arguments concerning the importance of civic education in high school. Developing our thematic furthermore, we consider that the subjects of our research (students in the 1<sup>st</sup> year, Physical Education and Sports, Kinetotherapy study program), at least on theoretical level, have the civic competences needed to be able to actively exercise citizenship. According to EU these competences focuses on "a knowledge of basic democratic concepts including an understanding of society and social and political movements" (Citizenship Education in Europe, 2012, p.8). Moreover these civic competences also require some practical skills such as "critical thinking and communication skills, and the ability and willingness to participate constructively in the public domain, including in the decision-making process through voting. Finally, a sense of belonging to society at various levels, a respect for democratic values and diversity as well as support for sustainable development are also highlighted as integral components of civic competences" (Citizenship Education in Europe, 2012, p.8).

## **Material and methods**

In our research we have used the following research methods: bibliographical study, test method, statistical analyses. We have used Chi Square test and Fisher exact probability test at the level of  $p = .05$  significance. We also use Pearson correlation. The data was analyzed with the SPSS IBM 19 statistical program. In this study we used a psychosocial test measuring the level of civic sense. This test had 15 items concerning the practical knowledge about the values and attitudes for what civic education stands for (Neculau, A. et al., 1999, p. 79-81).

In our study were engaged a number of 112 students (N=112) from Babeș Bolyai University, Physical Education and Sport Faculty. Starting from gender criteria we had 51 females and 61 males, and the age average of the female subjects was 19,55 years and the male subjects was 20,05 years.

## Results

The gender differences related to practicing sports in the past have been highlighted in Chart No 1. According to the Fisher exact probability test ( $p = 0,045$ ) it is a statistically significant difference between female and male regarding practicing sport in the past. From the data we can deduce that no. of 36 male subjects have practiced sport in the past, meanwhile only 21 female subjects have practiced sport.

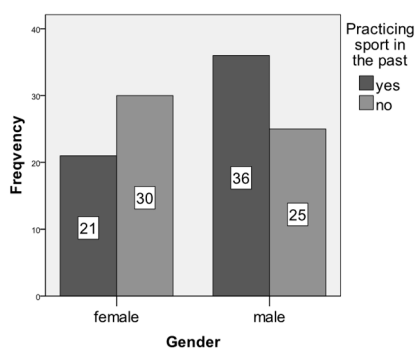


Chart no 1 - Practicing sport in the past - by gender

The gender differences related to the practicing sports in the present have been highlighted in Chart No 2. According to the Fisher exact probability test ( $p = 0,045$ ) it is a statistically significant difference between female and male regarding practicing sport in the present. From the data we can deduce that no. of 16 male subjects are practicing sport in the present, meanwhile only 6 female subjects are practicing sport.

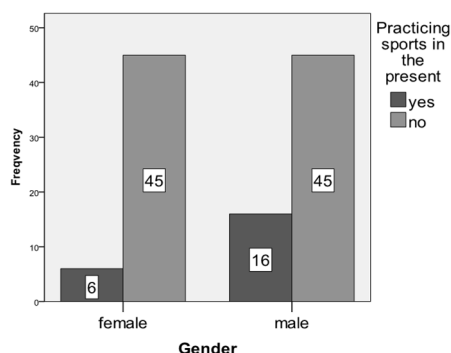


Chart no 2 - Practicing sport in the present - by gender

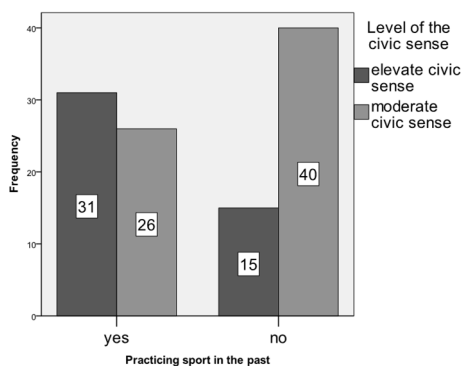


Chart no 3 - Practicing sport in the past and the level of civic ...

The relation between practicing sport in the past and the level of civic sense is presented in Chart no.3. It was a statistically significant difference between those subjects who practiced sport in the past and those who didn't practice sport activities ( $X = 8.5$ ,  $df = 1$ ,  $p = 0,004$ ). Those subject who had practiced sport have an elevate level of civic sense from those who didn't practiced sport in the past.

It is a significant positive relation between practicing sport in the past and a high level of civic sense ( $r = 0,276$ ,  $df = 110$ ,  $p < 0,003$ ). (Table no.1)

**Table 1.** Pearson Correlation - Practicing sport in the past and the level of civic sense

		Practicing sport	Level of the civic sens
Practicing sport	Pearson Correlation	1	.276**
	Sig. (2-tailed)		.003
	N	112	112
Level of the civic sense	Pearson Correlation	.276**	1
	Sig. (2-tailed)	.003	
	N	112	112

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

There isn't a statistically significant difference between the levels of income and the level of the civic sense ( $X = 0,74$ ,  $df = 1$ ,  $p = 0,391$ ). (Chart no.4)

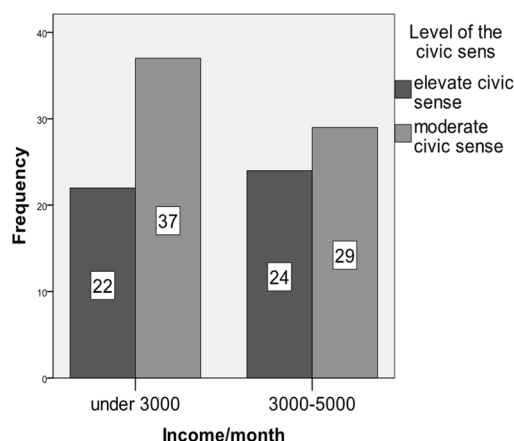


Chart no.4 - Incom/month and the level of civic sense

According to our results, the level of the civic sense is not influenced by the level of incomes.

There isn't a statistically significant difference between genders regarding their attitudes toward respecting the law only from fear of being punished ( $X = 2,7$ ,  $df = 1$ ,  $p = 0,100$ ). Although analyzing the Chart no 5 we can conclude that 82 subjects from 112 declare that the majority of the people respect the law only by the fear of punishment.

There isn't a statistically significant difference between genders and their beliefs concerning that the people lie for their own interest ( $X = 0,05$ ,  $df = 1$ ,  $p = 0,821$ ). Starting from our data we can sustain that 106 subjects of 112 are saying that the majority of the persons lie for their own interest. (Chart no.6)

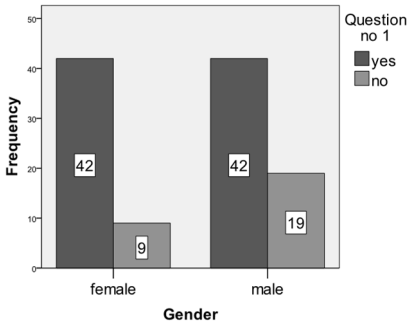


Chart no 5 - Respecting the law only by fear of punishment - by gender

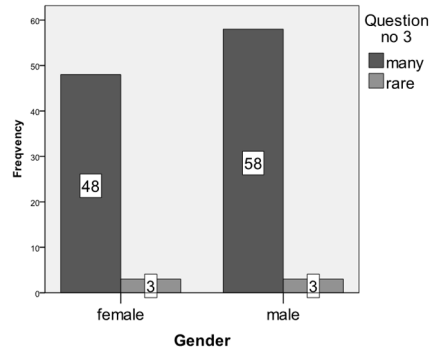


Chart no 6 - Persons who lie for their interests - by gender

Starting from our data we have realized that it isn't a statistically significant difference between genders and their feeling of being protected by the presence of the police forces in their community ( $X = 2,25$ ,  $df = 1$ ,  $p = 0,134$ ). Although Chart no 7 emphasizes that 80 subjects of 112 are feeling protected by the presence of the police forces in their community.

We were interested about the subjects' attitudes regarding the

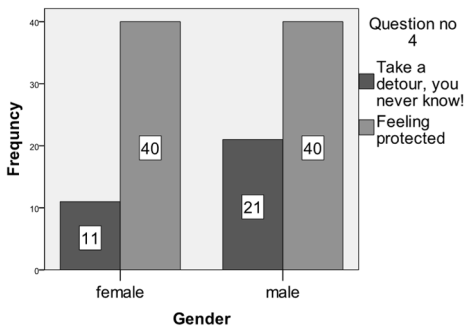


Chart no 7 - Attitude toward feeling protected by the presence of the police forces in the community- by gender

enlisting in the military services. There isn't a statistically significant difference between genders and their attitude concerning military service ( $X = 1,12$ ,  $df = 1$ ,  $p = 0,290$ ). Our data show us that the majority of the subjects ( $n=76$ ) would enlist, in the military service, if it would be mandatory (Chart no 8).

We were interested about the subjects' opinion regarding the fact that it is an interdiction of smoking in public places. It is a significant statistically difference between gender and

smoking in public places ( $X = 4,32$ ,  $df = 1$ ,  $p = 0,038$ ). More male subjects ( $n=57$ ) than female ( $n=41$ ) consider that it is normal to have an interdiction of smoking in public places.

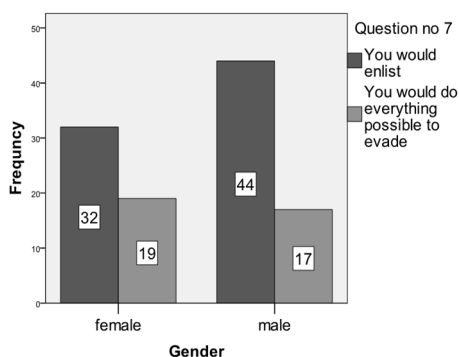


Chart no 8 - Enlisting in the military service - by gender

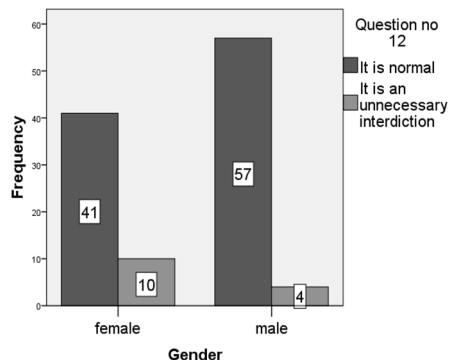


Chart no 9 - Smoking in public places - by gender

## Conclusions

We were surprised, in a negative way, by the weak number of the students, even if their faculty has a sportive profile, regarding their attendance in the sport performance field. In totally, only 22 subjects (16 male and 6 female) from 112, declare that they still practicing sport performance activities.

As we have expected, through this study, we found a positive correlation between practicing sport activities, even in the past, and a high level of civic sense.

We thought that the level of civic sense is influenced through a high rate of incomes, but in our study we didn't find a significant difference between the level of incomes and the civic sense.

When compulsory military service was suppressed, several teenagers were very content. Contrary to our expectations, a lot of young people, even the girls, said that they would enlist in the military service. This answer means that the young people still have a patriotic sense regarding their country.

We have expected that the confidence in police forces, in our days, is weak, but the data show us that the subjects are feeling protected by the police forces presence in their community.

In civilized countries the citizens respect the law, because this behavior comes from inside (probably after a lot of studies/experiences achieved in their family and school educational system), instead our results show us that the major part of the subjects, involved in this study, agreed with the fact that the majority of the persons respect the law just by having fear of an eventual punishment.

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## COMPARATIVE ASPECTS OF THE MAIN SKI SCHOOLS IN THE WORLD

TUDOR BOGDAN<sup>1\*</sup>, LĂCRIMIOARA LAZĂR<sup>2</sup>

**ABSTRACT.** Alpine skiing is one of the most practiced winter sports due to accessibility and attractiveness of which enjoys these sports nowadays. This situation has helped the development of tourism services, aligned ski areas, ski equipment and materials industry, and current guidelines and methodical sequence learning pedagogy of skiing, all putting in the spotlight client, the individual and his personal issues. We speak of an orientation towards the individual needs of each of us, in order to give us a greater psychological comfort, a general feeling of well (well-being). In this idea, both methodology and pedagogy of teaching and learning of skiing (because of this discipline sports talk here) was centered on the learner, existing, internationally, a tendency to uniformity of content learning skiing to the detriment of divergent opinions that were promoted by some ski schools in the world. For a better understanding of the phenomenon of learning ski, we present in a comparative manner, the conception of the main ski schools in the world. The main points of comparison are the teaching progression in ski, and the motor skills.

**Key words:** *ski, skiing pedagogy, skiing methodology, skiing skills, wedge, wedge turn*

**REZUMAT.** *Aspecte comparative ale principalelor școli de schi din lume.* Schiul alpin este unul dintre cele mai practicate sporturi de iarnă, datorită accesibilității și atractivității de care se bucură aceste discipline sportive în zilele noastre. La această situație a contribuit evoluția serviciilor din turism, arondate domeniilor schiabile, industria materialelor și echipamentelor de schi, dar și orientările actuale ale succesiunii metodice și pedagogiei învățării schiului, toate plasând în centrul atenției clientul, individul și aspectele sale personale. Vorbim de o orientare spre nevoile individuale a fiecăruia dintre noi, cu scopul de a ne

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<sup>1</sup> "Bogdan Vodă" University from Cluj Napoca, Faculty of Physical Education and Sport Baia Mare

<sup>2</sup> Secondary School "Dr. Victor Babeș", Baia Mare

\* Corresponding Author: [tdbogdan@gmail.com](mailto:tdbogdan@gmail.com)



oferii un confort psihologic sporit, o stare generală de bine (well being). În această idee, atât metodică cât și pedagogia predării-învățării schiului (pentru că de această disciplină sportivă vorbim aici) a fost centrată asupra celui care învață, existând, la nivel internațional, o tendință generală de uniformizare a conținutului învățării schiului, în detrimentul opiniilor divergente care erau promovate de anumite școli de schi din lume. Pentru o mai bună înțelegere a fenomenului învățării schiului, prezentăm, într-o manieră comparativă, concepția principalelor școli de schi din lume. Principalele elemente de comparație sunt: succesiunea metodică a elementelor și procedeele specifice schiului alpin, deprinderile motrice din schiul alpin etc.

**Cuvinte cheie:** *Schi, pedagogia schiului, metodică schiului, deprinderi motrice, plug*

## Introduction

Contemporary society's tendency is to turn more and more towards the individual's personal needs and to streamline its business, all safer. Basically the key word today is "safe". These issues are highlighted by examples that manifest in our daily lives: the increased role they have insurance (of any mandatory or not), increasing the frequency of calls to the consumer protection service, the development of protective equipment manufacturing industry for sports activities, transportation etc..

Winter sports, being an area of high population spread, attracting still a growing number of practitioners, the diversity of forms, on skis or snowboard, follow this trend. Theme of accidents encountered on the ski slopes is of great interest and attention of industry specialists in producing ski equipment, sports science, in order not only to avoid injury, but to create a practitioner of mind. Notably, safer helmets, bindings who release ski boots faster, skis adapted to physical fitness and technical development level of skier, and clothing that provides higher waterproofing and breathability etc.

In terms of ski equipment evolution, is necessary and updating for the learning lesson management of ski, talking about methodological, psychopedagogical and lesson organization aspects. The objective of these measures should be the focus of the entire training process on the learner, organizing learning content according to their needs, providing reliable, but fast, progression, in a quiet environment, and psychological comfort in the ski lesson. To fulfill these requirements, the literature recommends the adoption of guided discovery teaching style, which is also called cognitive learning. This supports the idea that

learning is not coincidental, or simply the result of repetition. Learning is the result of adaptation to life experiences. The student sees the whole task and the overall situation, adapt to new experiences, thus making progress. Therefore it recommends a holistic approach to learning ski.

From cognitive perspectives, learning could be described more as an extended model on many levels, than a linear one. I mean an execution; an exercise leads to a discovery that causes another discovery, which ultimately translates into learning

A student-centered lesson will mold to the needs of the child, not the student will try to adapt to the conditions of the lesson. Student-centered learning requires the teacher's attention to emerging situations. In this lesson, child skills development of sliding ski is achieved through a variety of demonstrations, alternating the exercises and the sliding surface form; children are always subject to new situations.

Current pedagogy of skiing try to shorten learning period, promoting the idea that, depending on individual characteristics and level of knowledge, the child will use the snow plough, plough to parallel etc. only as means to reach the final goal (parallel turning), and not as intermediate targets (Bogdan Tudor, 2011).

In terms of methodology skiing, internationally, there is a common trend line, whereby early levels will use wedge turn and as the purpose of learning, parallel turn. For those who wish to pursue higher stages of learning, it can offer several options, including: carved turns on groomed slopes, turns on steep slopes, turn off-piste, or ski in the park & pipe.

### **Objectives of the paper**

This paper comes to highlight similarities and differences between the main ski schools in the world, focusing on the following aspects:

1. The progression of learning ski, trends in internationally ski learning
2. Skiing skills,
3. Way of achieving plough turns.

**1. The methodological progression of learning alpine ski** - we will refer only to basic technique, starting with accommodation with the equipment, parallel turns, considering this stage of learning, determinant for the future direction in which the skier want to develop. We want to present learning concepts in countries with tradition in learning skiing because the general trend is to simplify the methodical line, or even more, the current design allows the instructor to skip certain procedures, if considers that successful learning will not be affected.

**Table 1.** Methodical progression of the main ski school from the world

Nr.c rt.		BASI 2011	CSIA 2011	DSV 2004	DSV 2012	Interski De. 2011	DSL V 2012	Österreich 2011	SWISS 2010	PSIA 2007
1	Equipment accommodation Stand, walk, turn, climb	X	X	X	X	X	X	X	X	X
2	Snow plough simulation									X
3	Walking on 1 or 2 skis									X
5	Walking on flat and uphill					X				
6	Sliding, Straight run	X	X	X	X	X	X	X	X	X
7	Straight run and wedge stop					X	X		X	
8	Wedge or Snow plough	X		X	X		X	X		X
9	Stopping		X							
10	Isolated wedge turn	X	X	X	X	X				X
11	Linking wedge turn		X		X	X	X	X	X	X
12	Traversing	X					X	X	X	
13	Skidding	X					X	X	X	
14	Carving - fundamentals				Avansați		Avansați	X		
15	Plough to parallel	X			X	X	X		X	
16	Stem Christie			X					X	
17	Parallel turn	X		X	X	X		X	X	
18	Braking									
19	Short turns								X	
20	Carve turn Carve turn – long - short			X		X		X	X	
21	<b>Freeride</b> Off-piste Steep Moguls	X				X		X	X	
22	<b>Slopestyle – Park &amp; Pipe</b>	X				X		X	X	
23	<b>Introducing to competition</b>					X		X	X	

Table 1 present the central concept of learning to ski in six countries: Canada, USA, UK, Germany, Austria and Switzerland, covering the main literature sources, of existing on the data of developing this paper. The general trend that emerges is the snow plough (wedge) used for breaking and turning. However PSIA (2007) presents, the ski progression with parallel ski, called direct method, or DSV (2004) mentions the turning technique with successive steps as preparatory element helps in learning turning.

Referring to an early stage of learning ski, we can say with certainty that all representative skiing schools around the world, teach following technical elements, respecting the following chain:

1. Accommodating with the equipment,
2. Straight run,
3. Snow plough or wedge,
4. Wedge turn,
5. Traversing and sides lipping,
6. Plough to parallel,
7. Parallel turns.

However there are differences in the approach of ski learning process, between countries from Americas and Europe. The PSIA provides methods oriented very much towards the learner, providing to ski instructor several didactic routes which can be followed, depending on the specific customer, but also the knowledge that he has. This approach is very much oriented towards the learner, will mold perfectly to its specificity, but requires the instructor a very large base of knowledge, enabling it to modify the content of the training, the chosen route, if occurs problems in achieving goals.

An aspect that can generate a trend is the conception of the Austrian Ski Association (OSV 2011), which proposes to teach carving turns starting with beginner's level, even before parallel turns.

Methodical procedures contained in the sequence shown above, are taught in the lessons for beginners (BASI 2011, Interski Deutschland 2011), or during the first two stages of learning: beginners and advanced (CSIA 2011 DSV 2012 PSIA 2007 OSV 2011). In higher stages of learning are provided more opportunities for development as follows:

- ✓ Moguls
- ✓ Off-piste – deep snow
- ✓ Steep
- ✓ Park & pipe
- ✓ Competition technique

Together they appear more well-defined ski learning concept especially for children, youth, seniors, or people with special needs, as particular pedagogical approaches of the same lines explained above.

## 2. Alpine skiing skills

Concrete action skier on the ski slopes is determined by the mutual influence of factors that make "SKI system" man - ski - environment. We talk about how the body and the environment influence each other, with the medium interaction ski equipment, ski bindings and ski boots. Keeping the system in a state of homeostasis results in concrete, control speed and direction of movement of the skier, the performance of specific motor actions as form and content, called motor skills. In fact, skiing is a simple formula (PSIA 2007:11):

- ✓ Keep balance while slipping,
- ✓ Bend body parts to put the skis on edge,
- ✓ Rotate feet, hips and / or trunk to help the skis to turn,
- ✓ Control the pressure along the ski to turn trace on snow, and manage the constantly changing terrain and snow.

Learning skiing skills is at the core of what we do on snow, and is manifested precisely in the area of interaction of the two subsystems: human (ski) - snow. Understanding, identifying and influencing motor skills by the ski instructor is the key to success in learning skiing. Motor skills are actions that are manifested in the snow, exactly at the ski snow interaction from this perspective it is important that ski instructor to assess how the skills are executed. We believe that to influence the proper execution of techniques, ski instructor must give methodological guidance to address the exact underlying mechanism, mechanism that generates braking or turning movements. Thus, every move we make has four major skills (Fellow C. 2011:42-43, PSIA 2007:12):

- ✓ **Balance** - plays a key role in the effective implementation of techniques. In alpine skiing, the most balance on skis is manifested in motion, under the name of "dynamic balance". For this reason only after we have a balanced position on skis we can add new elements in the learning process.
- ✓ **Edging** - Putting skis on edge and the ability to control the angle formed between ski and snow, in order to ensure a steady, balanced position, or to make a carved turn without braking, without skidding.
- ✓ **Rotation** - involve aspects of the movement of the body, resulting in rotation of the ski action. Once sliding techniques improves,

rotations are reduced to parts of the body, especially the lower body. The most effective rotation involves edging movements and pressure control on edges, movements which determine steering the ski during the turn.

- ✓ **Pressure** - or pressure control on the edge - is the ability to control and manipulate skier variations in pressure between ski and snow. This is accomplished by muscular effort or forces involved in the turn.

Together with the four skills, CSIA (2011:4.11) adds coordination and rhythm skill that BASI manual (2011:15) is found in the term "flow", referring to the fluidity of movement.

Viewed from an integrative perspective the 4 skills listed above are closely interrelated in that, depending on the type of skier and ski practice, proportion of skills may differ. So if in any case the balance is the environment where it manifests edging, rotation and pressure control, in the beginners cases it is worse than if advanced learners, or edging and pressure control are more pronounced if practiced skiing on steep slopes than in the deep snow.

The techniques performed on the snow, for example, plough brake, travers run, plough to parallel etc., are composed of skills listed above, only in different proportions, depending on the specific technique. Basically technical processes are performing at a higher level, specific motor skills or, from another perspective, motor skills compose the technical procedure.

We should mention here quite similar concepts presented Interski Deutschland (2011:16) and Swiss Snowsports Association (2010:41) that without mentioning the idea of motor skills, says the following motions as determined Ski: movement scales, rotation, loading / unloading ski equipment load, and moves the center of gravity of the body - which is the balance (center of gravity position of the body generates steady body).

### 3. Way of achieving wedge turn

Wedge turn is the first turning action used in methodical progression of learning ski by all ski schools presented in this paper. Although in current pedagogy, this way of turn is not an objective of learning. By correctness and reliability of this method depends largely on the success and quickness of learning following procedures, especially parallel turn. For this reason we consider very important conducting a review of current trends to achieve this procedure.

**Table 2.** Comparative presentation of the way of achieving the wedge turn

<b>Association</b>	<b>Description</b>	<b>Indication</b>
<b>CSIA 2011:3.16</b>	From straight run, or traverse, in wedge, turning the skis to the new desired direction	For indication we can use turning the toes or the ski tips, to the new direction.
<b>BASI 2011:44</b>	Rotate both legs and feet to the desired direction	The outside ski be set on a natural way on the wedge, to get the grip and to generate the turn
<b>PSIA 2007:63</b>	From straight run, drive actively both skis to the desired direction	Use the rotation movement and pressure control.
<b>ÖSV 2011:47</b>	From the wedge position, rise the pressure from one of the skis, and soil reaction will result in steering the turn	A movement like flexion-extension, which generates an action of loading-unloading effect of skis, can help. It can be used to the advantage of the terrain, working in half-pipe.
<b>DSL 2012:72</b>	1. From straight run in wedge, rise the pressure from one ski 2. From straight run in wedge, by rotary movement of skis, try to steer the skis out from the fall line	
<b>DSV 2012:139</b>	For changing the direction in wedge, rotate the skis out from the fall line	
<b>Interski Deutschland 2011:52</b>	Anything is possible	It'll be done short turn to fall line, than bigger
<b>SSSA 2010:140</b>	Rotate the body to the desired direction	

Wedge is a basic element in the ski progression, because it assures the security of the learner, making their first turns, keeping them in control of speed, and from now, the direction too. Also, emotionally, the success of the first turn is overwhelming, maybe even determinant for the future executions, because for the first time in life when the skier draws curves trajectory. That's the reason why the ski instructor has to identify the most secure, comfortable, but the easiest too, way to teach the turn.

Respecting the actual pedagogical trends, the North American ski school PSIA and CSIA, the Great Britain BASI, the Swiss SSSA, and even the German Ski Federation DSV, gives as indication for the first turn, simply to steer the skis to the desired direction. Mechanism that will trigger this process will be the rotary movement of the legs. For the success of this movement, is important to combine the skiing skills in different proportion. All this recommendations are for the beginners who want to learn skiing, by anchoring the daily reality, proposing

motor activities similar to those from our daily life, attempting connection to life skills which man has made. In everyday life, if a man wants to turn to right, just turn to the right and continue on its way.

Austrian Ski Federation (OSV) use guidelines, and trigger mechanism still slightly different, namely emphasized edging the outside ski marked as trigger of wedge turn.

Interesting, and very free is the concept of German associations, which ultimately, states that wedge turn is correct by any mechanism as long as satisfy the conditions of security of the skier, only given the next stage – parallel turn - it is recommended to perform certain movements (Interski Deutschland 2011:52-53).

## Conclusions

After analyzing the literature, namely textbook for learning and teaching ski of representative ski schools around the world, according to the three directions of development of the present study, we can point out the following trends in teaching alpine skiing and more.

1. The progression of learning alpine ski follows the following route:

- ✓ Accommodating with the equipment,
- ✓ Straight run,
- ✓ Snow plough or wedge,
- ✓ Wedge turn,
- ✓ Plough to parallel,
- ✓ Parallel turns.

These learning moments can be joined other exercises that help to achieve the ultimate objective - avoiding parallel turns, such as preparatory exercises without skis, or single ski, successive steps turns, plough to parallel, traverse, side-slipping etc.

Also at this level can be drawn following areas of development: carved turns on groomed terrain, turns in deep snow, turn on the moguls, competitions turn, notion of park and pipe.

2. Importance of motor skills in alpine skiing comes from the fact that manifests itself, and directly influences the interaction between the ski and snow, which are the motor acts that determine the form and content of our behavior on skis. The main skiing skills are: balance, edging, rotations, pressure control edges.

3. Primary trigger mechanism of wedge turn is rotation, and indications are most commonly used is turn your skis, or legs to the desired direction of sliding. Other mechanisms and exercises will be used in the consolidation phase of wedge turn.



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## ISOTONIC VS. ISOKINETIC AQUATIC TRAINING: IMPROVEMENT OF THE NEUROMUSCULAR CONTROL OF THE LOWER LIMBS IN HEALTHY AND UNTRAINED FEMALES

JUDIT-KLÁRA MARIAN<sup>1\*</sup>, NICOLAE HORĂȚIU POP<sup>2</sup>

**ABSTRACT. Introduction.** The most important advantage of isotonic training is that there is no need for the human body to perform adjusting processes during execution: hence the accuracy of movement is less perturbed. Recent studies have shown balance and stability improvements after isokinetic training performed either by dynamometer or aquatic programs. **Purposes.** Our primary goal was to determine what the difference is between concentric isotonic and aquatic isokinetic training programs and how much these types of trainings affect the neuromuscular control of the lower limbs. Improving the subjects' fitness level and their motivation to exercise regularly was the secondary goal of this study. **Methods.** Ten young, healthy and untrained female adults participated in this study. The subjects were divided into two groups: aquatic (n=5) and fitness (n=5). Before and after training the subjects' lower limb neuromuscular control was assessed by the Shark Skill test (SST). The aquatic group (AG) trained in a 1.5 meter deep swimming pool, while the fitness group (FG) trained at a gym, using weights. The subjects of both groups trained for six weeks, three times per week. **Results.** The final SST proved bilateral amelioration of the neuromuscular control for AG, while FG improved unilaterally. The dominant limb improved more than the non-dominant one. The length of the lower limb negatively influenced the initial SST scores, especially at the FG. The tallest subjects of the AG developed the most their neuromuscular control. **Conclusions.** Post-experimental neuromuscular control improved in both groups. We did not find evidence that a group improved more than the other. The length of the lower limb negatively influences the neuromuscular control, but it can be developed due to regular training sessions of the lower extremity. The subjects' fitness level and motivation for regular training increased.

**Key words:** isotonic, isokinetic, neuromuscular control, lower limb

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<sup>1</sup> Kinetoterapeut voluntar la Centrul de zi pentru persoane vârstnice, Aleșd

<sup>2</sup> Universitatea „Babeș-Bolyai” Cluj-Napoca, Facultatea de Educație Fizică și Sport

\* Corresponding Author: m\_judith17@yahoo.com

**REZUMAT. Compararea antrenamentului izotonic cu antrenamentul izokinetic acvatic: îmbunătățirea controlului neuromuscular al membrelor inferioare la femei sănătoase și neantrenate. Introducere.**

Principalul avantaj impus de antrenamentul izotonic se manifestă prin absența capacității de adaptare a organismului pe parcursul exersării, facilitând o execuție mai precisă, lipsită de factori perturbători. Studii recente dovedesc ameliorarea echilibrului, în consecință și a stabilității, în urma antrenamentelor izokineticice fie pe dispozitiv, fie în mediul acvatic. **Obiective.** Depistarea diferenței dintre efectele antrenamentului izokinetic acvatic și antrenamentului izotonic concentric asupra controlului neuromuscular al membrelor inferioare a reprezentat obiectivul primordial. Secundar, am urmărit creșterea nivelului de fitness al subiecților și dezvoltarea motivației acestora de a efectua exercițiu fizic.

**Metode.** Zece subiecți tineri, sănătoși, neantrenați și de sex feminin au participat la acest experiment. Aceștia au fost evaluați prin testul Shark (SST) și împărțiți în două grupe experimentale: lotul bazin (n=5) și lotul fitness (n=5). Lotul bazin (AG) s-a antrenat la o adâncime a apei de 1.5 metri, iar lotul fitness (FG) a efectuat exerciții într-o sală de fitness cu ajutorul aparatelor. Ambele grupe s-au antrenat cu o frecvență de trei ședințe pe săptămână, pe durata a șase săptămâni.

**Rezultate.** Conform SST, AG a demonstrat îmbunătățiri bilaterale ale controlului neuromuscular, iar FG a evoluat doar unilateral. S-au observat ameliorări din perspectiva membrului dominant. Lungimea membrelor inferioare a influențat negativ scorul inițial al SST, vizibil în special la FG. Controlul neuromuscular al subiecților cu membre inferioare mai lungi din AG s-a dezvoltat în cea mai mare măsură.

**Concluzii.** Controlul neuromuscular post-experimental a fost îmbunătățit în cazul ambelor loturi. Diferența dintre efectele celor două tipuri de antrenament este nesemnificativă. Lungimea membrelor inferioare influențează negativ controlul neuromuscular, însă acesta se poate îmbunătăți prin efectuarea regulată a unor exerciții fizice analitice adresate trenului inferior al corpului. S-a atins obiectivul creșterii nivelului de fitness și obținerea aspirației de a efectua exercițiu fizic în mod regulat.

**Cuvinte cheie:** izotonic, izokinetic, control neuromuscular, membre inferioare

## Introduction

The difference between the effects produced by isotonic and isokinetic trainings have been studied for the last decades. Some studies demonstrated that besides strength and endurance enhancements, other effects may appear as well.

The majority of training programs are based on isotonic muscular activity, using weights. The most important advantage of isotonic training is that there is no need for the human body to perform adjusting processes during execution: hence the accuracy of movement is less perturbed. Physical activity performed in water is less common and it is completely different than working out using weights. The aquatic environment provides a specific exercising condition due to the reduced influence of gravity and the other properties of water: viscosity, buoyancy and hydrostatic pressure (Pop, 2013). This way, it is much harder to master motor control. It has been shown that the aquatic environment stimulates deep and cutaneous nerve endings (Salvi, Quarenghi & Quarenghi, 2006; Katsura et.al, 2010) as well as the feed-forward and feedback mechanisms in order to maintain correct posture (Roth et.al, 2006; Sarshin et.al, 2012). Other recent studies have claimed balance and stability improvements in healthy adults after isokinetic training performed either on isokinetic dynamometer or in water (Jalili, 2011; Kim et.al, 2011; Sarshin et.al, 2012). Condromalacia patellae (Yildiz et.al, 2003) and functional ankle instability (Sekir et.al, 2007) in recreational athletes were also ameliorated after isokinetic training; the researchers assumed proprioception and balance development. Since proprioception, stability, feed-forward and feedback mechanisms are component parts of the neuromuscular control, these results suggest that regular isokinetic muscular activity improves the neuromuscular control to a larger extent than the isotonic training would do.

Analyzing the two muscular activity types, comparative investigations were conducted by Avelar et.al, 2010, and Kieffer et.al, 2012. Each of them studied healthy elderly subjects. Avelar et.al found static and dynamic balance improvements in both isotonic and isokinetic conditions. Kieffer et.al proved enhanced functional abilities in the aquatic isokinetic group. According to Golik-Peric et.al, 2011, an isokinetic protocol performed on a dynamometer confirmed production of more significant effects than the isotonic exercise program, when aiming to reduce asymmetry between quadriceps and hamstring muscles.

On the contrary, several other researches failed to demonstrate any positive change in motor control after isotonic or isokinetic exercise programs. Wojtoys et.al, 1996, applied strength training programs on the lower limbs in three different conditions: isotonic, isokinetic and agility. Examining the neuromuscular adaptations accomplished by these programs, they noticed upgrade of muscle reaction time only in the agility group. The isotonic and isokinetic groups did not reveal any results. Likewise, Remaud et.al, 2010, studied the neuromuscular adaptations of the quadriceps muscles by comparing the outcomes of isotonic versus isokinetic training programs. The results of their research evidenced increase of muscular strength without any significant difference between the two training groups.

## **Purposes**

The purpose of this study was to compare the effects produced by isotonic versus isokinetic muscular activity. Our primary goal was to determine what the difference is between concentric isotonic and aquatic isokinetic training programs and how much these types of trainings affect the neuromuscular control of the lower limbs. Improving the subjects' fitness level and their motivation to exercise regularly was the secondary goal of this study.

## **Methods**

Ten young, healthy and untrained female adults were recruited in this study as volunteers, giving informed consent about their agreement to participate. The subjects were freshmen students at the Faculty of Letters, belonging to the „Babeş – Bolyai” University of Cluj-Napoca. None of them suffered injuries or surgical interventions of the lower limbs. According to the subjects' preferences, they were divided into two experimental groups: aquatic (n=5) and fitness (n=5).

Prior to applying the training programs, the subjects filled in a questionnaire giving information about their physical activity status, based on three parameters: intensity, duration and frequency. Under this assessment, the subjects were classified as sedentary or relative sedentary. Following this, height, weight and the length of the lower limbs were determined. Stating the dominant leg was achieved by questioning the subjects about which one of the legs they would use for kicking a ball. The neuromuscular control of the lower limbs was assessed by the Shark Skill test (SST).

The aquatic group trained in a swimming pool, belonging to the “Universitas” Swimming Pool in Cluj-Napoca. The depth of the water was of 1.5 meters and its temperature was of 33°C. Attending the gym of the Faculty of Sports and Physical Education, the fitness group practiced using weights. Both experimental groups trained for six weeks, three times per week. Each training session lasted approximately 45 minutes, starting with a 10 minute warm-up, followed by the exercising protocol and a 5 minute stretching for cool-down. The training protocols included ankle, knee and hip joint drills.

After six weeks of practice, a final assessment was completed. A second weight measurement was taken along with repeating the SST and filling in an anonymous questionnaire in consideration of the subjects' fitness level and their motivation for regular training.

## Results

According to the subjects' answers, related to their initial fitness level, two out of five subjects belonging to aquatic group (AG) were leading a sedentary lifestyle, while the other three were relatively sedentary. In the fitness group (FG) all subjects admitted to be sedentary.

With respect to the dominant leg test, all subjects of FG affirmed that their right legs were the dominant ones. One out of five subjects in AG would kick a ball with the left foot; the other four would use the right one.

**Table 1.** Mean and SD values of weight and SST

Parameters	Aquatic Group		Fitness Group	
	Pre-training	Post-training	Pre-training	Post-training
<b>W</b>	79.6 ± 16.34	81.1 ± 16.31	57.8 ± 11.21	58.1 ± 10.44
<b>RLL</b>	12 ± 2.89	10.56 ± 2.7	11.88 ± 2.71	10.44 ± 1.14
<b>LLL</b>	13.16 ± 4.95	11.02 ± 2.57	14.12 ± 2.66	10.98 ± 1.85
<b>DLL</b>	11.6 ± 2.52	10.62 ± 2.73	-	-
<b>NdLL</b>	13.56 ± 4.99	10.96 ± 2.55	-	-

W, weight; RLL, right lower limb; LLL, left lower limb; DLL, dominant lower limb; NdLL, non-dominant lower limb.

Using the Paired Samples t-test pre- and post-training weight and SST scores were statistically analyzed at a  $p < 0.10$  significance level. The mean and the standard deviations (SD) for each measurement are represented in Table 1. The high values of SD in case of weight indicate major differences among the subjects, ranging from low values to high values. Neither the AG ( $p = 0.224$ ), nor the FG lost weight ( $p = 0.345$ ). Moreover, there is a slight increase in both groups, which probably is a result of muscle gain.

After the intervention the SST scores for AG diminished in RLL ( $p = 0.047$ ) and LLL as well ( $p = 0.064$ ). The SD for LLL reduced considerably, increasing the homogeneity of the group, meaning that divergence among the motor control level of the subjects tended to gather to a common basis. FG claimed marked results only at LLL ( $p = 0.024$ ). Although a tight decrease of the SST scores for RLL exists, these results are not statistically significant ( $p = 0.123$ ).

In most of the cases the neuromuscular control is asymmetrical. There is a tendency to use the dominant limb more frequently; that is why inequalities are expected to be met between the neuromuscular control of dominant and the non-dominant limb. Taking into consideration this aspect, pre- and post-training SST scores were analyzed from this perspective, too. Statistical interpretation of the data revealed a true improvement for DLL of AG ( $p = 0.053$ ), while NdLL failed to progress ( $p = 0.038$ ). The SD value of NdLL diminished in the same manner it did

in case of LLL. This decline was foreseeable, given that LLL was the non-dominant limb in 80% of the subjects of this group. Since every subject of the FG claimed RLL to be the dominant one, examination corresponds to the one described above at RLL and LLL section.

Confronting the results of the two experimental groups, we conducted data analysis employing the Independent Samples t-test. Similarly to former analysis, calculations were made at  $p < 0.10$  significance level. Exactly as we predicted, there was no difference regarding the initial SST scores of the groups for either lower limbs as Table 2 shows ( $p = 0.473$  for RLL;  $p = 0.356$  for LLL). Surprisingly, apart from the SD value, no other distinguishing progress was discovered between AG and FG ( $p = 0.464$  for RLL;  $p = 0.49$  for LLL), presented in Table 3. The SD value reduced repeatedly, approaching the subjects' control level to a common basis.

**Table 2.** Initial mean and SD values of SST

	AG	FG
<b>RLL</b>	$12 \pm 2.89$	$11.8 \pm 2.71$
<b>LLL</b>	$13.16 \pm 4.95$	$14.12 \pm 2.66$

AG, aquatic group; FG, fitness group; RLL, right lower limb; LLL, left lower limb

**Table 3.** Final mean and SD values of SST

	AG	FG
<b>RLL</b>	$10.56 \pm 2.7$	$10.44 \pm 1.14$
<b>LLL</b>	$11.02 \pm 2.57$	$10.98 \pm 1.85$

AG, aquatic group; FG, fitness group; RLL, right lower limb; LLL, left lower limb

A possible correlation between the length of the lower limbs and the SST scores was examined. We used the Pearson's correlation calculated by the Microsoft Office Excel 2010 programme. For AG the initial SST scores were in a slight positive interaction with the length of lower limbs. Pearson's coefficients gave negative values when confronting final SST scores with the lower extremities length. The essence of these results is that, former to the training sessions, the taller subjects of AG performed poorer than the smaller ones, which turned the other way around after the experiment, especially for RLL. The correlation coefficients computed for FG presented positive values at both limbs prior and post intervention as well. The initial scores were much superior to the final ones, expressing early negative influence of the length of the lower limb on the neuromuscular control, which modified post experiment. These results are more emphasized in case of RLL.

**Table 4.** Correlation coefficients

Pearson's correlation		Initial	Final
AG	RLL	0.042	- 0.242
	LLL	0.002	- 0.074
FG	RLL	0.770	0.203
	LLL	0.563	0.387

AG, aquatic group; FG, fitness group; RLL, right lower limb; LLL, left lower limb

Fitness level improvement was noticed by every subject participating in this study. Regarding their motivation to continue regular physical activities, nine out of ten claimed to remain active and one preferred leading the same lifestyle she was used to.

**Discussion**

The effects produced by a concentric isotonic versus an aquatic isokinetic training were studied in relationship with the neuromuscular control of the lower limbs. After 18 training sessions organized in six weeks, differences and similarities between the two experimental groups were found as well.

Weight changes produced by the training programmes are not statistically significant. The existing slight gain is probably due to muscular hypertrophy, as a result of regular physical activity.

Bilateral amelioration of the neuromuscular control was established for the aquatic group. The fitness group improved unilaterally, developing only the left lower extremity’s agility. One possible explanation for this might be an early satisfying motor control of the right leg, which was the dominant one for all subjects of the fitness group. Therefore, the left lower extremity progressed in a greater extent, also validated statistically.

Significant statistical evidence was found from the dominant leg’s angle, too. Initially, the homogeneity of the aquatic group was small, but post-interventional analysis showed a positive increase of this parameter. The revealing improvement hints at reaching to a common control level of the subjects. Since all participants of the fitness group claimed the right leg to be the dominant one, this perspective coincides with an already existing analysis.

Former to the experiment, we presumed that divergences will be found between the outcomes of the two training types. However, no statistically significant dissimilarity was collected. The conclusive development of both of the experimental groups certainly owes to the early sedentary lifestyle of the subjects.



Apparently, poor fitness level can be developed easily with any kind of regular physical activity, may that be concentric isotonic or aquatic isokinetic training. Perhaps studying physically more active people, some obvious discrepancies would have been observed. Besides, conducting a long-term research and using a larger number of participants might demonstrate other effects on the neuromuscular control of the lower limbs.

Considering that the center of gravity during orthostatic position is situated at the second lumbar vertebrae, the longer the lower limbs are, the harder it is to maintain balance. Gribble & Hertel, 2003, examined the role of foot type, height, leg length and range of motion while performing the Star Excursion Balance Test and found that height and leg length interact with balance. Denyer, 2013, confirmed that foot structure plays an important role in neuromuscular control, too. Thus, we considered examining the neuromuscular control with respect to the lower limbs' lengths. As it was expected, length negatively influenced the initial SST scores for both groups, especially for the right legs of the fitness group. We suppose that a physiological asymmetry is present for everyone, as a result of having a dominant and a non-dominant side of the body. As a child grows into an adult, their dominant leg becomes specialized in making more precise and controlled movement patterns, like kicking a ball for example. At the same time, the other leg needs to bear the whole bodyweight, being trained to stabilize the body while the movement is being accomplished. Therefore, the SST scores were obviously higher for the less controlled leg, which was the left one for each subject of the fitness group. After the experiment, disparity between the two limbs reduced, similarly as it happened in a study organized by Golik-Peric et.al, 2011.

Surprisingly, the taller subjects of the aquatic group developed their neuromuscular control to a greater degree than the shorter ones. The length of the lower limb as well as the orthostatic posture maintained during the exercises could have had a positive effect. The longer the limbs were, the greater the amplitude of motion is and the larger the surface is, that can be stimulated by water. Consequently, taller subjects might have perceived every exercise more intensely than the shorter subjects did. As we do not have evidence for this theory, it could be studied in a future research.

## Conclusions

Both concentric isotonic and aquatic isokinetic training programs improve the neuromuscular control of the lower limbs. Post-experimental SST scores validate development in both groups, without any significant difference

between them. The lack of discrepancy might be caused by the short period of the research, the reduced number of participants or the poor fitness level of the subjects. Ameliorations are present from the dominant-non-dominant point of view, too. The length of the lower limb negatively influences the neuromuscular control, but it can be developed due to regular training sessions of the lower limbs. This improvement was particularly noticed at the taller subjects of the aquatic group. The subjects' fitness level and motivation for regular training increased.

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## OPTIMISATION OF THE SELECTION PROCESS IN FOOTBALL GAME FOR 10-12 YEARS OLD CHILDREN

DAN MONEA<sup>1\*</sup>, SEPTIMIU ORMENISAN<sup>1</sup>, EMILIA GROSU<sup>1</sup>,  
PAULA APOSTU<sup>1</sup>, DELIA NICA BADEA<sup>2</sup>

**ABSTRACT.** The essence of the selection is to establish a diagnosis, a prognosis of the future developments in the field of sports performance. As a basic tool in this action are at our command the tests. Regarding sports performance, these issues were discussed in several meetings of the European Federation for Sport and Corporal Activities, having the goals the standardization of the tests in sport. The final conclusions certify the unanimous use of the psychomotor tests, appropriate to the studied group age. It was proposed to establish some batteries of tests and the analysis of the results for planning the age-specific sports training.

**Keywords:** *selection, player, tests, optimization, results*

**REZUMAT.** *Optimizarea procesului de selecție în jocul de fotbal la copii în vârstă de 10-12 ani.* Esența selecției constituie stabilirea unui diagnostic, a unei prognoze a evoluției viitoare în domeniul performanțelor sportive. Ca instrument de bază în această acțiune ne stau la îndemână testele. Referitor la domeniul sportului de performanță, aceste aspecte au fost dezbătute în cadrul mai multor reuniuni ale Federației Europene Pentru Sport și Activități Corporale, având ca obiective standardizarea testelor în domeniul sportului. Concluziile finale certifica întrebuințarea unanimă a testelor psihomotrice, adecvate grupei de vârstă cercetată. S-a propus stabilirea unor baterii de teste și analiza rezultatelor, pentru planificarea pregătirii sportive specifice vârstei.

**Cuvinte cheie:** *selecție, jucător, teste, optimizare, rezultate*

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<sup>1</sup> University of Babes-Bolyai, Faculty of Physical Education and Sport, Cluj-Napoca

<sup>2</sup> University "Constantin Brâncuși" from Târgu Jiu, Faculty of Medical Science – Department of Sport and Health

\* Corresponding Author: moneadan@yahoo.com

## **Introduction**

The investigation of the events which succeeded in the world of football over the past decade, is offering us an amount of information for deciphering and formulating the organizational principles of the total game, in a synthesis based both upon a series of valid concepts and methods of the contemporary science (system, structure, organization, decision, information, etc.), and also on other younger, in-full affirmation.

The purpose of choosing the theme is to make the selection of a football team, to deal the notions of initiation and learning the fundamental technical processes of the game of football and to follow the team performance in inter-school competitions. The theme of this paper is presented in purely technical aspect without being neglected the psychological preparation characteristic to this age.

In soccer, as in any sport or sports game selection has its special role in that they permanently needed choice, finding the best and able children to become high performance players, especially now when all teams, from the smallest up to high performance clubs, have an interest in select, increase and promote more players (Ștefan & Velea, 2002).

On the issue of sports orientation, we must recognize that some of the material provisions of the first methods to achieve a basic general training and then routing to a particular sport seem to be forgotten, especially for sports games (Cernăianu, 2001).

In the present work we propose the approach of some efficient methods and means and characteristics of the respective age viewing the initiation learning of the techniques and their implementation during the football games. We choose this theme regarding the possibilities for optimization of the selection process in the game of football, because this factor of the training has a particularly important weight in the training process and because of the fact, that great performance in football cannot be conceived without a superior technical and tactical.

Mastering the techniques in the performance football game increases the efficiency of each player individually and of the team as a whole.

A proper technical training of the performance football can be achieved with specific means of the football game, but also with means specific of other sport disciplines. All these means made scientifically and rationally assist in the preparation of the general physical preparation and particularly of the specific one.

These considerations led me to choose the present theme considering that technical training is the most important in the terms of training at any coach.

Being given the features and characteristics of age, technical training is carried out also on the basis of volume and intensity which are leading to the enhancement and improvement of technical processes by the large number of repetitions, especially in learning, aiming at the optimal correlation between volume and intensity (Dragnea, 1996).

For any technician most handy selection criterion remains the most convincing game for children and youth and those consecrated as efficiency and effectiveness in the game are decisive arguments in achieving good results in the league or official competitions (Ștefan & Velea, 2002).

### **Materials and Methods**

The following research methods were used in this study: the documentary method, the experimental method and the statistical method. Descriptive statistics were performed on all recorded data.

These samples were initially applied on the 18-th of September as initial test and at the date of the 30-th of January as final test. In the course of our research we applied the following general physical training tests:

***Speed Running 50m.*** This sample was made with standing start and the junior was timed from the first move. We have given him two tests, the second after a period of 15 minutes, taking into account the best time.

***Long Jump.*** In this sample was allowed the execution of the jump with just one swing of the arms. We also allowed two tests taking into account the best jump. We measured the distance from the tips of the legs (before the jump) and position of the heels (landing).

***Endurance Running.*** This test was conducted over a distance of 600m, the age of the children, being under 12 years. In this sample they ran once. Children who turned the race to walking I considered dropping out, and I noted with "0" points (1 case).

***Throwing the rounder's Ball.*** It was executed with one hand on the spot. We have given them two tests, considering the best throwing.

***Pull ups.*** The bar is gripped with palms facing inward, with arms bent at the elbows, chin above the bar. We granted one test.

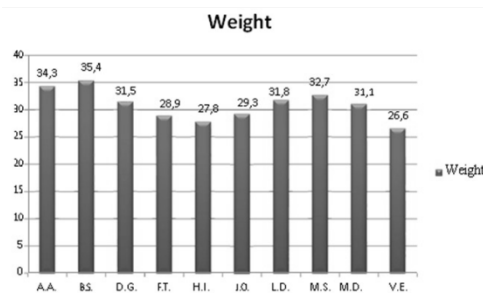
***Sit ups.*** The initial position is lying on the back with hands behind the head, elbows on the mat, knees bent, feet on the mat, tiptoes being supported under the fixed scale. At the signal, the performer raises the trunk vertically, in seated position, with elbows touching knees, then immediately returns to the original position for repeating the execution. We considered as correct only those executions where elbows touched the knees when lifting. The execution time was 30 seconds

## Results

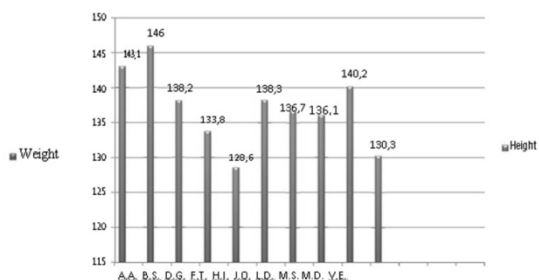
Physical development is defined as the outcome and influencing action in the correct and harmonious growth of the human body. The human body grows to a certain age, but this development can be influenced by the process of practice of the physical exercises. Physical exercises acts on the body with a special methodology to ensure a harmonious development at different ages.

**Table 1.** Anthropometric measurements

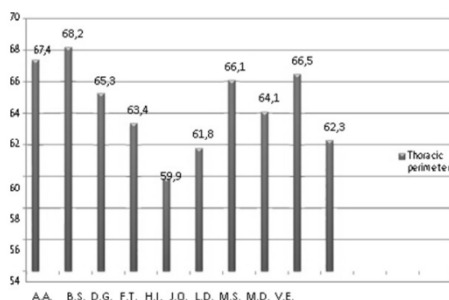
No.	Name	Age (years)	Weight (kg)	Height (cm)	Thoracic perimeter (cm)
1	A.A.	12	34,3	143,1	67,4
2	B.S.	12	35,4	146,0	68,2
3	D.G.	11	31,5	138,2	65,3
4	F.T.	10	28,9	133,8	63,4
5	H.I.	10	27,8	128,6	59,9
6	J.O.	10	29,3	138,3	61,8
7	L.D.	10	31,8	136,7	66,1
8	M.S.	11	32,7	136,1	64,1
9	M.D.	11	31,1	140,2	66,5
10	V.E.	10	26,6	130,3	62,3



**Fig. 1.** Representation of the weight of the subjects



**Fig. 2.** Representation of height

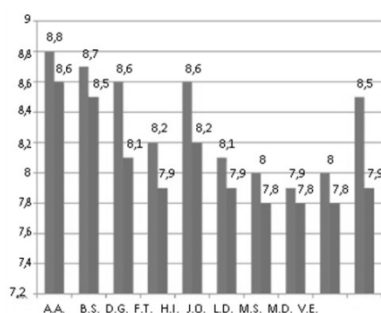


**Fig. 3.** Evaluation of the thoracic perimeter

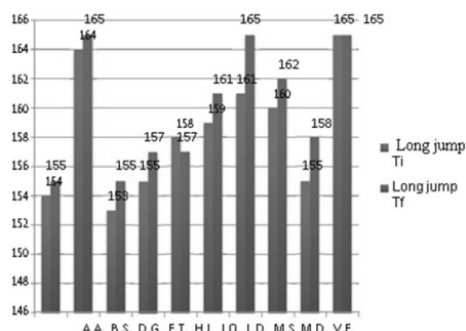
Next we want to present the centralizing of data obtained in the course of the research.

**Table 2.** Evaluation of the subjects in the initial and final physical tests

No.	Name	Speed running 50m		Long jump		Endurance running		Trowing the ball		Pull ups		Sit ups	
		Ti	Tf	Ti	Tf	Ti	Tf	Ti	Tf	Ti	Tf	Ti	Tf
1	A.A.	8,8	8,6	154	155	3,46	3,44	20	23	4	6	18	20
2	B.S.	8,7	8,5	164	165	3,48	3,46	21	24	3	5	18	19
3	D.G.	8,6	8,1	153	155	3,45	3,41	22	22	4	5	19	21
4	F.T.	8,2	7,9	155	157	3,44	3,41	23	24	3	5	24	25
5	H.I.	8,6	8,2	158	157	3,42	3,38	23	25	2	4	26	28
6	J.O.	8,1	7,9	159	161	3,48	3,36	21	22	5	4	24	25
7	L.D.	8,0	7,8	161	165	3,51	3,48	20	21	6	8	19	21
8	M.S.	7,9	7,8	160	162	3,58	3,51	19	22	2	5	18	19
9	M.D.	8,0	7,8	155	158	3,44	3,40	20	23	5	7	17	19
10	V.E.	8,5	7,9	165	165	3,55	3,49	20	24	7	8	25	27

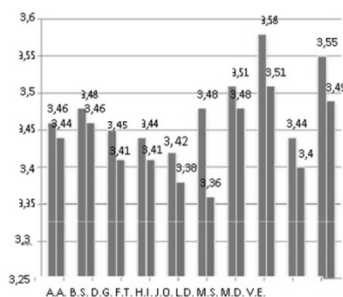


**Fig.4.** Testing in the Speed of 50 m

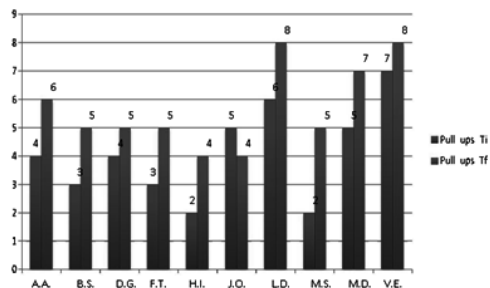


**Fig.5.** Graph Sample Testing in the Long Jump

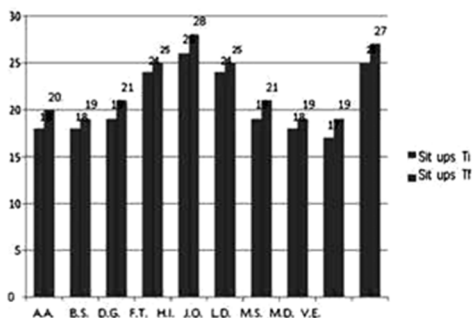




**Fig. 6.** Endurance Running Testing (600 m)



**Fig. 7.** Evaluation in Sample of pull ups Test



**Fig. 8.** Evaluation of sit ups

For selection in football at this age group are used the following battery of tests.

### Physical Standards:

1. Speed Running on the distance of 20 m; are given two attempts with 5 minutes break between them, registering the best. The timer triggers at the start signal.

2. Speed Running on the distance of 30 m; are given two attempts with 5 minutes break between them, registering the best. The timer triggers at the start signal.

3. 5x10m shuttle; it is drawn on the field two parallel lines at the distance of 10 m apart. Behind the two lines in the vicinity of their plot are drawn two circles with a diameter of 0.5 m, side by side. In each of the two circles situated behind one of the lines, it is placed a piece of wood, which has the shape of a cube with sides of 5 cm.

The performer has his two feet in the circles which has no cubes. At the signal, the performer runs to bring a cub and plant it in one of the circles in which he initially stayed with his feet, then goes immediately to bring the second in the other circle. From the starting signal until the planting of the second cube is timed. The cubes are placed by hand, being forbidden their throwing. Is given two trials, with a break of five minutes each and recorded the best.

4. Endurance running 800m; time is recorded in minutes and seconds.

5. Bilateral Game 4x4;

6. Bilateral Game 7x7;

7. Bilateral Game 11x1

### Technical Standards:

1. Keeping the ball in the air;

2. From 20m to 16m advancing then moves up to the line of the gate and shoots on goal. The ball must go beyond the goal line in the air.

### Morphological requirements:

Waist over medium and high (150 cm);

Physical robustness.

**Table 3.** Physical and technical tests

Tests	Mark 1	Mark 2	Mark 3	Mark 4	Mark 5	Mark 6	Mark 7	Mark 8	Mark 9	Mark 10
Speed running 20m	4,14	4,13	4,12	4,11	4,10	4,09	4,08	4,07	4,06	4,05
Speed running 30m	6,4	6,3	6,2	6,1	6,0	5,9	5,8	5,7	5,6	5,5
Endurance running 800 m	4'.15"	4'.10"	4'.05"	4'.00"	3'.55"	3'.50"	3'.45"	3'.40"	3'.35"	3'.30"
Shuttle 5x10m	20,6	20,5	20,4	20,3	20,2	20,1	20,0	19,9	19,8	19,7
Keeping the ball in the air (sec)	15"	20"	25"	30"	35"	40"	45"	50"	55"	60"
Bilateral game 4x4 small pitch 2x10 min	It is estimated behavior in game									
Bilateral game 7x7 small pitch 2x10 min										
Bilateral game 11x11 big pitch 2x10 min										

## Conclusion

- As the results of the experiment we found, regarding the level of driving training, physical and functional development that these parameters are in "normal range", studying the scales of the National School System of Assessment
- After centralised data analysis can be seen an increase at all six tests: speed running 50m, Length Jump in Place, Resistance Running, Throwing the Rounder's Ball, Traction, Trunk Raising from lying in sitting.
- The analysis of the indicators in our experiment shows a substantial increase from the initial test application and the final one, the difference in time being of only 5 months.
- Selecting and developing the action means is a fundamental condition for the coach and the teacher to clearly shape the content of the educational activity process and that of performance.
- The structure and content of training applying movement games with the elements of football game will arise from the objectives of each training in part.
- For objectives being achieved it must be chosen systems of action which are appropriate for the material basis.
- The means chosen must respect the effort curve for the training effort in the organization and leading of training with technical elements of the football game will be respected its structure in parts

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## THE CORRECTION OF THE SPINAL COLUMN DEVIATIONS FOR CHILDREN WITH SPECIAL EDUCATIONAL NEEDS FROM SECONDARY SCHOOL

MARIA-DANIELA MACRA-OȘORHEAN<sup>1</sup>\*, ÁGNES SIMON-UGRON<sup>1</sup>,  
ANDREEA RALUCA TOHAT<sup>2</sup>

**ABSTRACT.** *Introduction:* The correction of the spinal column deviations for children with special educational needs is an important aspect, especially in the context of the current tendency of social inclusion for this category of people. A correct posture represents the "cornerstone" for a healthy lifestyle, and this implies paying more attention to physical exercises, alimentation and the balance between work and rest. *Material and methods:* The research had been done on a group of six students with special educational needs from "Special number 2 secondary school" from Baia Mare and it was held between 15.11.2013 and 30.04.2014. The recovery programs include both simple and complex exercises, with a higher level of difficulty. Having in mind the special features of the subjects, the recovery period was parted in three stages. *Results:* The improvement of the rib cage mobility in the final evaluation was visible for every participant. Regarding the abdominal perimeter when it comes to inhaling and exhaling, the improvements had been up to 1cm in the final evaluation for most cases. After testing the mobility by measuring the distance between the fingers and the ground in the final evaluation, the results had improved significantly for most subjects. *Conclusion:* The improvement of the respiratory capacity is demonstrated through the progress regarding the rib cage mobility, the abdominal perimeter and the torso for all the participants from the recovery program. The amelioration of articular mobility is also confirmed by the results obtained after having applied the specific tests.

**Key words:** *educational needs, correction, mobility.*

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<sup>1</sup> Faculty of Physical Education and Sports, „Babeș-Bolyai” University, Cluj-Napoca, Romania

<sup>2</sup> Physiotherapist, Baia-Mare (Kangoo Jumps Instructor, Paris, France)

\* Corresponding Author: miamacraosorhean@yahoo.com

**REZUMAT. Corectarea deviațiilor coloanei vertebrale la elevii cu cerințe educative speciale din ciclul gimnazial.** *Introducere:* Corectarea deviațiilor coloanei vertebrale la elevii cu cerințe educative speciale reprezintă un aspect important, mai ales în contextul tendinței actuale de incluziune socială al acestei categorii de persoane. O postură corectă reprezintă „piatra de temelie” pentru un stil de viață sănătos, iar acest lucru implică acordarea unei atenții deosebite exercițiilor fizice, alimentației și echilibrului dintre muncă și repaus. *Material și metode:* Cercetarea a fost realizată pe un grup de 6 elevi cu cerințe educative speciale de la "Școala gimnazială specială numărul 2" din Baia Mare și s-a desfășurat în perioada 15.11.2013 - 30.04.2014. Programele de recuperare conțin atât exerciții simple cât și exerciții complexe, cu un grad mai ridicat de dificultate. Având în vedere particularitățile subiecților, perioada de recuperare a fost împărțită în 3 etape. *Rezultate:* Îmbunătățirea mobilității cutiei toracice în cadrul evaluării finale este evidentă la toți participanții. În ceea ce privește modificarea perimetrului abdominal în inspir și expir maxim, se poate observa o îmbunătățire cu 1cm în cadrul evaluărilor finale în majoritatea cazurilor. În urma aplicării testului de mobilitate reprezentat de distanța degete-sol din etapa finală a cercetării, se pot observa cele mai semnificative îmbunătățiri la majoritatea subiecților. *Concluzii:* Îmbunătățirea capacității respiratorii este demonstrată prin progresele obținute în ceea ce privește mobilitatea cutiei toracice, perimetrul abdominal și bustul în rândul tuturor participanților la programul de recuperare desfășurat. Ameliorarea mobilității articulare este confirmată de rezultatele obținute în urma aplicării testelor specifice.

**Cuvinte cheie:** cerințe educative, corectare, mobilitate.

## Introduction

The motor development for children with mental deficiencies is directly proportional to the deficiency and the physical development level. The motor and psycho-motor organisational plans are different from the normal children and they are caused by:

- ✓ „the immaturity or the lesion of the morphofunctional structures responsible for the general and special motor activity;
- ✓ The subcortical lesions which do not allow an integrative synthesis coordination for the motor behaviour;
- ✓ The emphatic autonomy of the somatic structures in comparison to the psychological ones;
- ✓ The lack of a hierarchical ascending and descending organisation in the transmission and the procession of the information;
- ✓ The weak intellectual dominance” (Teodorescu, 2003, p. 148).

The main problems in means of motor abilities for the mentally deficient are:

- ✓ they execute with difficulty fundamental moves, having problems with oculomotor, auditive, verbal or physical coordination;
- ✓ the quality of the moves is lowered by the weak motor development;
- ✓ they have a low capacity of coordinating the motor activities guided only by verbal indications. They need to be accompanied by demonstrations;
- ✓ turning from one movement to a new one is more difficult if it includes using equipment or other objects;
- ✓ usually they cannot find a suitable way of expressing their thoughts, ideas or feelings through adequate gestures;
- ✓ being overweight in some cases can affect the biomechanics and the stability;
- ✓ the arrhythmic respiration and its lack of control;
- ✓ the low muscle tone can negatively influence the movements of the mentally deficient (Bălțeanu, 2005; Gherguț, 2007, Bujdosó, 2010).

Giving equal chances in teaching children with special education needs, regardless of the physical, intellectual, linguistic or any other kind of ability the children posses, is a basic condition when it comes to their mental and social development.

To reach certain performances with these students thorough preparations, tact, pedagogical mastery and the continuous training of the teacher are needed for acquiring some skills and motor habits among students. Any kind of activity must be initiated and conducted in a language accessible to the age and the particularities of the participants; this will favourably contribute to boosting their personalities.

### **Materials and methods**

The research has been done on a group of 6 students with special education needs from the "Special Secondary School number 2" from Baia Mare and it was held during the following period of time: 15.11.2013- 30.04.2014. The group consisted of three boys and three girls, with ages between 13 and 14 years.

For holding the recovery program we had a kinetotherapy room available which offered all the conditions needed for the study, evaluation and recovery through medical gymnastics. The analysis passed off in collaboration with the physiotherapists from the school.

**Table 1.** The presentation of the studied group

Nr. Crt.	Name and Surname	Sex	Age	Diagnostic
1.	S.A.	F	13	Kyphotic attitude; slightly mentally retarded
2.	S.A.	F	13	Kyphosis; slightly mentally retarded
3.	T.T.	F	13	Kyphotic attitude; slightly mentally retarded
4.	C.D.	M	13	Kypho-lordosis associated with lumbar scoliosis; slightly mentally retarded
5.	C.E.	M	14	Kyphosis associated with thoracic scoliosis; severe mental retardation
6.	V.V.	M	13	Kyphotic attitude; autism

The research took into consideration the following aspects: the place, the materials and the working conditions, the schedule of the subjects, their level of motor and psychological development and the period of time spent for the recuperation.

The research methods were: bibliographic documentation, observation and the interview. These methods allowed us to obtain general and more specific information regarding the subjects which facilitated the organisation of the activities.

The recovery programs contain both simple and complex exercises, with a higher difficulty level. Having in mind the particularities of the subjects, the recuperation period was parted in three stages (Gallahue, 1993; Sbenghe, 1999; Teodorescu, 2003; Marcu, 2007; Vekerdy, 2010; Marolicaru, 2011).

Because 4 out of 6 subjects weren't attending physical education classes, the first step was to teach the children basic exercises for the locomotor apparatus (Chelemen, 2006).

The second and the longest lasting stage consisted of many recovery exercises which were executed in the order of their difficulty and complexity. The children's will to learn the exercises faster was also determined by the alternation between the types of exercises, in this way maintaining their interest and involvement.

Because the subjects were 13 and 14 years old, at the end of every session we played a game which involved movement. Along with the exercises done in pairs, the games turned out to be an essential part in the socialization and relaxation process of the subjects, next to the therapeutic one.

At the end of the recovery program we applied the exercises done during the research period in the form of a circuit. This meant that each subject had to execute as many correct repetitions of an exercise as he could in two minutes, and after a one minute break he had to exchange seats with one of his colleagues so he could turn to another type of exercise. Before starting the exercises, they were explained and demonstrated if necessary so that every student knew what he was supposed to do. During this program the subjects were monitored, corrected and encouraged not to stop until they heard the signal that the exercise was over. Thus, at the end of the circuit, every subject had executed 6 exercises, each of them lasting for two minutes.

## Results

### *a) Results obtained at the end of the evaluations*

The mobility of the chest is a useful method to measure the respiratory capacity. The results obtained at the end of the first measurements indicate values between 1cm and 9cm. According to the values presented in the second table, subject C.D. (boy) has the lowest level of chest elasticity and subject T.T. (girl) as the best value for this parameter.

Alongside the chest mobility, measuring the abdominal perimeter while inhaling and exhaling is also a useful method of evaluation for determining the respiratory capacity (Kovács, 2010, Fazekas, 2010). The results obtained after the initial measurements indicate values between 0cm and 5cm.

The values obtained at the test that measures the distance between the fingers and the ground exceed 0cm, which is the normal value for this test.

The Ott test indicates values of distance between 0cm and 3cm, as against 8cm which would be the normal value in case of the absence of a pathological state of the spinal cord.

After taking the test which measures the distance when separating the fingers, the values were between 0,4cm and 1cm, opposed to the normal value, which is between 3cm and 4cm.

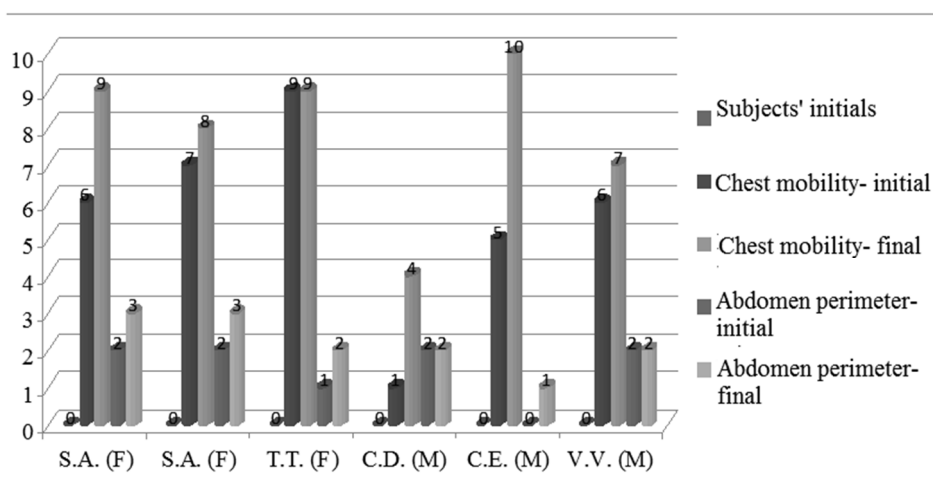
For the last test, the distance between the ear lobe and the acromion was between 9cm and 15cm when turning the head to the right and 8cm and 11cm when turning the head to the left. For this test, subjects C.D. and C.E. (boys) present different mobility values when turning their head to the right and left. The reason for these values are the deviations of the spinal cord in the frontal and sagittal plane: the kypho-lordosis associated with lumbar scoliosis and the kyphosis associated with thoracic scoliosis.



### ***b) The comparative interpretation of the test results***

In the following paragraphs we will present two comparative tables with the results obtained in the two key-stages of the research (initial and final). Before starting the interpretation, we would like to mention that the male subjects have more serious backbone deviation problems than the female ones and this reflects in their evolution during the recuperation program. Also, the different levels of mental retardation was an important factor in the progress of every subject.

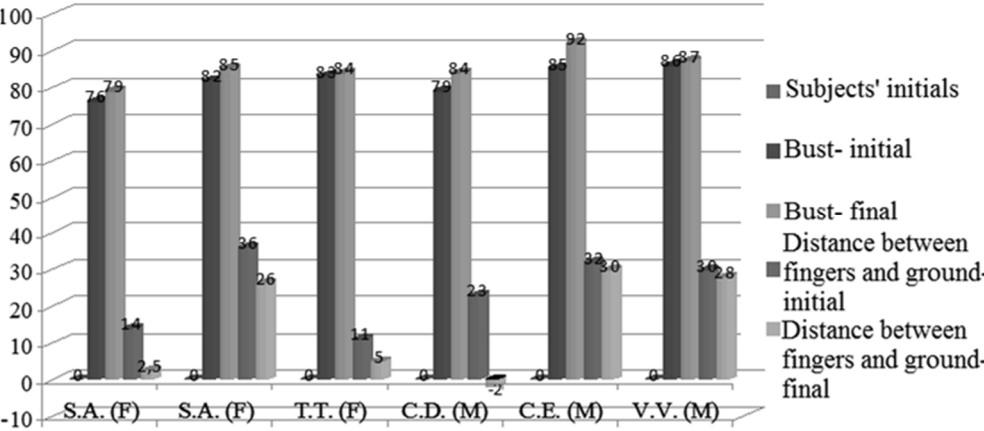
The results of the first three tests offer substantial information regarding the respiratory capacity of the subjects. For a more coherent explanation about the subjects' improvement, we will use a graphic representation.



**Fig. 1.** The representation of the initial and final results of the chest mobility and abdominal perimeter

The chest mobility improvement is obvious for all the participants from the final evaluation. Male subject C.E. has the best improvement for this parameter which states his thoracic respiration amelioration.

As far as the modification of the abdominal perimeter while inhaling and exhaling are concerned, an improvement of 1cm can be observed from the final examination in most cases, with the exception of male subjects C.D. and V.V. who had no changes for this parameter.



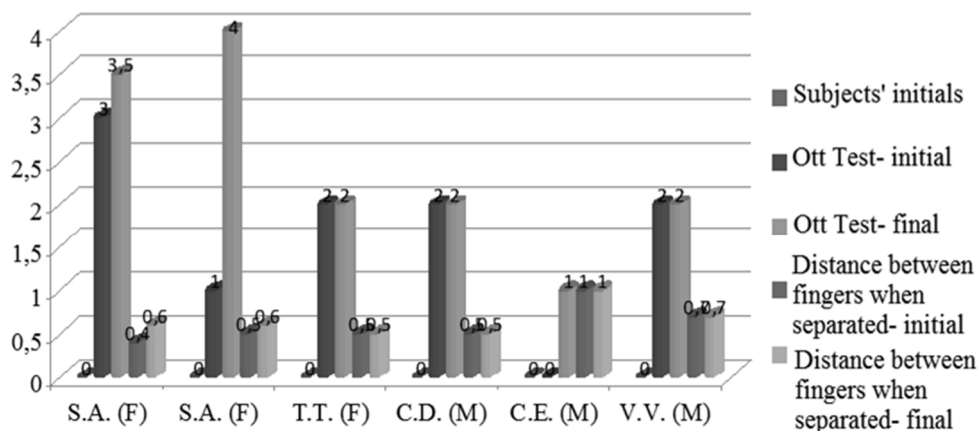
**Fig. 2.** The representation of the initial and final results of the bust and the distance between the fingers and the ground

The height of the body when sitting down (the bust) also presents improvements after the final measurements, which leads to differences between 1cm and 7cm from the initial evaluations. The best evolution can be seen at male subject C.E., who was diagnosed with kyphosis associated with thoracic scoliosis. This change indicates a significant amelioration of the subject's sitting posture and also the improvement of the muscle tone responsible for maintaining a correct posture.

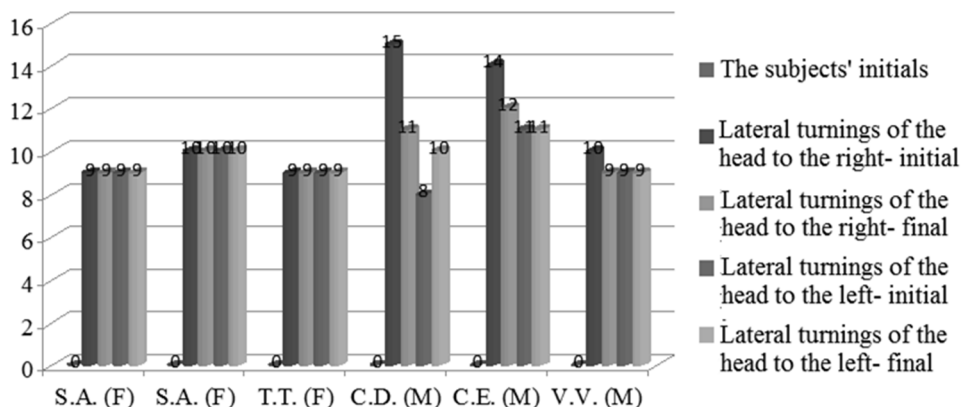
After the mobility test for the distance between the fingers and the ground from the final stage of the research, most subjects present great improvements, especially male subject C.D. with a 21cm difference from the initial evaluation and female subject S.A. with a 11,5cm difference.

When it comes to the initial and final results after the Ott test, we can observe the evolution of 3 subjects out of 6: female subjects S.A. and S.A. with an improvement of 3cm and 0,5cm and male subject C.E. with an improvement of 1cm.

The distance between the two marks (spinal aphopysis C7 and T1) did not have significant changes after the final evaluations, although there was an improvement for the female subjects S.A. and S.A. of 0,2cm and 0,1cm.



**Fig. 3.** The representation of the initial and final results for the Ott test and the distance between the fingers when they are separated



**Fig. 4.** The representation of the initial and final results for the lateral head turning

From the last test we can see a balance of the values obtained from the lateral turnings of the head to the right and to the left, especially for male subject C.D. Initially the subject had a 7cm difference between the two values, but after the final measurements the difference decreased to 1cm. Also, an evolution can be observed at male subject C.E. who initially had a 3cm difference that decreased to 1cm at the final evaluation.

## Conclusions

The children's will to involve themselves in the activities was directly proportional with the level of the anxieties, which is why there were individual differences that reflected on the evolution of the subjects during the recovery program.

According to the results obtained after the final evaluations we can conclude the following aspects from the subjects' improvements point of view:

The respiratory capacity is obvious after seeing chest mobility progress, abdominal perimeter and bust among all the participants of the program. After the final evaluation, male subject C.E. diagnosed with kyphosis associated with thoracic scoliosis and severe mental retardation, has the best improvements of chest mobility and body height while sitting down. This accentuates the improvement of posture and muscle tone, which was one of the objectives of the research. In comparison with the test of body height while sitting down where all the subjects had progressed according to the final examination, the abdominal perimeter test did not have notable progress for male subjects C.D. and V.V..

The articular mobility amelioration is confirmed by the progress achieved after having the following tests: the distance between fingers and the ground, the distance between fingers when separated, the Ott test and the lateral turnings of the head. For the distance between fingers and the ground test, male subject C.D. and female subject S.A. have the most significant progress with a 21cm difference and a 11,5cm difference in the final evaluation.

The correction of the spinal cord deviations for students with special education needs is an important aspect, especially when it comes to the actual social inclusion of this category of people. A correct posture is the „cornerstone” for a healthy lifestyle, and this implies paying more attention to physical exercises, nutrition and work and rest balance.

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## THE PEDAGOGUE-COACH AS A DETERMINANT FACTOR OF FOOTBALL TALENT DEVELOPMENT

DIÁNA DÉRI<sup>1\*</sup>

**ABSTRACT. Background:** By the 1990's a drastic decline of the general quality of football was experienced in Hungary which called for urgent actions in the field of talent development. Decision-makers realized that the development of more technically proficient home-grown players would be in everyone's best interests. **Objectives:** The aims of the study are the following: 1. to overview the evolution of the Hungarian Football Development Program; 2. to present the unique features of a youth football club participating in the Program as an example of good practice; 3. to examine the importance of coaches as educators of players. **Methods:** A qualitative research methodology has been applied in the study. Access was gained to archive sources (decrees, acts, accounts, committee meeting reports) related to state-aid of football talent programs which were examined through document analysis. The study also applied several in-depth interviews with those persons who had key roles in implementing the OTP Bank Bozsik Program in a football club through a fusion (N=5). **Results and conclusions:** The most important outcome of the predecessors of the OTP Bank Bozsik Program was that they gave a mass base for the selection of football talent which served the development of Hungarian football in the long run and also focused on coaches' education and professional development. The results also confirmed me that bigger emphasis must be put on the pedagogical knowledge learned within the football coach training.

**Key words:** *youth development, football, talent, physical education*

### Introduction

State participation in Hungarian football has always been present and most significant though with a considerably different system of aims and means (Ministry of Youth and Sports, 2000).

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<sup>1</sup> ELTE Doctoral School of Education, Budapest, Hungary. \* Corresponding Author: [diana.deri@gmail.com](mailto:diana.deri@gmail.com)

Along with the Hungarian Football Federation (HFF) that became anonymous in 1989, state football officially ceased to exist in Hungary. However, the organisational and economic system proved to be absolutely incapable of reviving football. The most serious mistake of Hungarian football was that no improvement strategies were devised (Földesiné & Gáldiné, 2008).

By the 1990's a drastic decline of the general quality of football was experienced in Hungary which made decision-makers realize that any recovery would urgently call for emphasis on talent development programs (Bognár, Géczi, Vincze & Szabó, 2009; Vincze, Fügedi, Dancs, & Bognár, 2008). It was realized that the development of more technically proficient home-grown players would be in everyone's best interests.

It is definite that all actors involved in football (coaches, players, league captains, the sport press, a section of the fans) saw the same possible way of progress in capital invested in the field and in the role of young talents (Krausz, 1999). On the other hand, talent development does not exist without high-qualified coaches (Géczi, Vincze, Koltai & Bognár 2008/2009).

### ***Coaches as pedagogues***

Likewise the pedagogues, the coaches as well have significant role in the establishment of premises of diverse development built on biological basis and abilities (Istvánfi, 2005). In the field of sport it is well-known that talent development requires not only good conditions of training and scientific services but also the complex and conscious pedagogical coaching is of primary importance (Géczi, Révész, Bognár, Vincze & Benczenleitner, 2005). Success cannot be assured without the profound pedagogical knowledge of coaches (Gombocz, 2004).

The coaches whom János Gombocz calls "educators of the fields", have to choose wisely what managing methods and guidelines to follow in their team, what kind of education and teaching styles are used, meanwhile, what motivational techniques and conflict management strategies are applied (Gombocz, 2002).

Unfortunately, coaches put more emphasis on the transfer of professional football knowledge than they put on the education of players (Németh, 2011).

### **Objectives**

The main aim of this study is to overview the evolution of the Hungarian Football Youth Development Program and to describe a good practise which makes more effective the development of talents as part of the Program. The study presents the strengths of the talent development system applied by the Csácsbozsok-Nemesapáti Sport Club (CSNSC). The third important aim was to examine the significance of the educator role of coaches.

## Methods

A qualitative research methodology has been applied in this study (document analysis, in-depth interviews).

The systematic examination of the printed and written materials played an important role in the study. It was important to examine documents, because they provided a behind the scenes view of a lot of aspects that might have not been available through other means of data collection (Tenenbaum, & Driscoll, 2005). First access was gained to archive sources related to state-aid of football talent programs. Interesting and important sources was found as related decrees, acts, accounts, committee meeting reports.

The study also applied several in-depth interviews with those persons who had key roles in implementing the OTP Bank Bozsik Program through a fusion (N=5) of which one manager, one schoolmaster, one coach, one councillor, one physical education teacher. During the interviews, audio recordings were made, or if the interviewee has not approved the audio recording, then written notes were taken. Prior to the conversations, the participants were informed about the confidential handling of their opinions, and their use exclusively for the purpose of the study. All opinions were taken into account during the research.

By the use of more than one source of data, triangulation of data was ensured in order to establish validity and reliability (Thomas, Nelson, & Silverman, 2005).

## Results and discussion

### *State-aided models of football talent program*

By means of document analysis I examined the antecedents of the current Hungarian Football Youth Development Program, the so called OTP Bank Bozsik Program which has an almost one and a half decade long history.

Talent identification had been operating since the conception of organized competitive sport but we have to go back only until the turn of the Millennium, when in the spring of 2000 the former Ministry of Youth and Sport (MYS) elaborated a complex development program of Hungarian football, the György Orth Reform Program. The third cornerstone of the György Orth Reform Program was the implementation of a standardized youth development system next to stadium reconstruction and initiation of the criteria of business-based football (reorganization).

Because of its significant and particular social role, the broadening, strengthening and supporting of football talent system became a major part of the National Youth Development Strategy.



On July 21, 2000 the MYS, the Hungarian Football Federation (HFF) and the Professional Football Sub-Association concluded an agreement of cooperation, in which the criteria of the implementation of the standardized National Football Youth Development Program were stated. The agreement disposed on the setting up of the National Football Academy (NFA) in order to coordinate and organize the tasks on the different levels of the Program. Until the voluntary dissolution of the non-profit company in 2004 the Advisory Board of NFA were formed by such legends of Hungarian football as Flórián Albert, Lajos Baróti, Jenő Buzánszky, Gyula Grosics, Rudolf Illovszky, Kálmán Mészöly and Ferenc Puskás.

The technical details of the Program, the division into school and club level were regulated by the Government Decision 1147/2001 on the state guarantee related to the Bozsik Program aiming the reform of the institutional system of youth development in the Hungarian football.

Due to this in 2002 the school football subprogram (Bozsik I.) with the responsibility of the MYS and club football subprogram (Bozsik II.) managed by the HFF and the NFA were operated parallel.

In the above mentioned Government Decision the Government also approved 5.2 billion HUF loan for leveling up club youth football. A Government Agent was charged with the coordination and monitoring of the utilization of this fund. Due to the Government Decision and the series of its amendments finally 0.5 billion HUF was granted for the HFF.

From 2004 the support system of Bozsik Program had changed and was replaced by a financing based on the Sport Ministry's budget appropriation.

From 1 September 2008 there was another change in the governance structure. From that time the Hungarian Youth Football Federation coordinated youth development at the schools and studentsport clubs, in the age group of 5-12.

The direct control went back to the HFF in 2011-ben when as a matter of fact the Program was restarted with a budget more than a billion HUF thanks to the OTP Bank and MOL who became the sponsors of the Program again.

The main objectives of the Program:

- Setting up a standardized and transparent youth development system.
- Authentic, up-to-date and controllable registration.
- Increasing the number of the registered football players participating in the Program.
- A modern competitive and training system based on the requirements and guidance of UEFA and FIFA.
- Broadening the basis of men's football.
- Formation of the youth basis of women's football.
- Selection and training of talents.

Main characteristics of the Program:

- Every level has a special role and significance.
- Synergia of the programs of different age groups.
- Every talent has to get the chance regardless age, gender, residence and social situation.
- Personality should be in focus.
- The development of talents should be ensured.
- The program should be developed continuously based on the experiences.

### ***Scenes of the OTP Bank Bozsik Program***

- Child Institutional Program: Its aim is to reorganise the “grund-age”, to make play enjoyable, to broaden the pool for the selection of gifted players. It supports out of class activities and events (festivals) in the schools and kindergartens. It requires 2 afternoon activities per week which offer the opportunity for regular training, play and match for children 5-14 year old.

- Child Club Program: Its aim is to establish a mass base in clubs, to strengthen the bonds to football, to lay the fundamental technical skills, to inspire creativity. Its most important element is the district-based tournament system in the age group of U6-7, U8-9 and U10-11. It requires at least 4-5 teams to take part in every district. It supports the trainers leading the tournaments and the organizing clubs, with the supervision of the trainer in charge of the subcenter and the county-level coordinator.

- Selection Program: It is implemented in the following, mutually integrated scenes: the district, subcenter, county, regional and national scenes, as well as the Youth Development Centre (Telki), each of which has a responsible professional leader appointed by HFF. This setup allows the selected football players to be given trainings that fit their age and talent.

In 2014/2015 the aim of the HFF in line with its strategic objectives is the increase of the mass base of football. Its intentions in numbers: in 20 countys, in 180 regions, in 2200 institutions, in 5400 sportgroups, 70.000 children's activities.

The indicators of Bozsik Institutional Program in the season 2014/2015: 107 subcenters, 214 groups, 1200 sportclubs, 70 000 registered players (between the age of 5-14).

It was reinforced that OTP Bank Bozsik Program has been elaborated on in detail, thoroughly considered, and structured in a systemic manner (Csáki et al., 2014).

### ***Good practice***

The Csácsbozsok-Nemesapáti Sport Club (CSNSC) in order to comply with the conditions of the OTP Bank Bozsik Program was formed by the fusion of a district (Csácsbozsok) of the chief town of Zala County and a village of 514 inhabitants (Nemesapáti).

The fusion was based on a simple but effective idea: to unify the strengths of two parties. The sportclub of Nemesapáti had a history of several decades, since it was established in 1928, firstly in football and bowling. It had a large grass field in good condition, while Csácsbozsok district had a modern indoor gym in an institution, the Imre Izsák Elementary School. So the available sport facilities defined the project.

The main goal of the club met the endeavours of the OTP Bank Bozsik Program: based on an own youth mass to train more and more children. CSNSC joined the Program with the Imre Izsák Elementary School for the September 2013 with 65 children. Girls are also involved in the Program.

The fusion fulfilled the expectations. The CSNSC already has 117 registered players in 7 age groups (U7, U9, U11, U13, U15, U17, and U21). It was not long before the success came.

Several talented players could reach the pitches owing to the deliberately planned and widely managed youth development and so soon the standard of CSNSC's play ameliorated, too.

The teams have 76 trainings per month in all.

But what are the reasons behind the positive experiences? Thanks to the fusion adequate infrastructure was provided. Committed human resources help the work. The Club follows the central regulations.

This triunity of human resources, facilities and regulations exist in other „Bozsik clubs”, too, so other factors are behind the results: the individual student treatment and talent care which can increase motivation and efficiency.

The founders of CSNSC carefully thought out their possibilities in order to work more effectively. The 7 teams are handled as one provided in this way the continuous youth development.

The small village and the ten times bigger district found common solutions. The students of the village were helped to the Program by the better facilitated (included high-standard human resource) urban institution. On the other hand those from the city can enjoy the advantages of the good infrastructure of the village.

CSNSC has many unique, special features.

Analyzing the statistics of the HFF on the utilization of the artificial grass field in 2014 multiple usages appeared unequivocally. The educational institution uses it for out and in class football, the sportclub for youth and adult team.

Those who participate in the Program can meet regularly the adult players, the ideals. It also has a pedagogic effect.

Establishing the local good practices helps first of all the selection mechanisms. Hence, the selection of football talents is a long-term, complex process (Lawrence, 2008).

The Club contributes to the progress. Based on the experiences of the performance measurements, comparative tests and practical observations, the most talented get special attention from the coach. They get the chance to join the A team in the 1<sup>st</sup> division. At the same time not only the most talented are treated by care. Those who by any reasons (e.g. injury) cannot perform adequately have the possibility to play football in a lower league until recovery.

In order to provide an evenly high-standard training for the players in the Program, an "internal coach-selection system" was in the Club. Recognizing the 18-21 year old players' personality, talent, managerial competence, every year the two most suitable players get the chance to participate in the UEFA licence training for coaches by the support of the Club. Its cost is covered by the incomes e.g. from rental fee, sponsorship.

One graduate and one university student also get support for their studies.

### ***Individual student treatment and talent care***

It is a very valuable idea of the Program that every talent has to get the chance regardless his social situation. The external factors (e.g. financial advantages, parental attitude) cannot be a bar of the development.

The CSNSC expects from its coaches to follow with attention the scholastic record of the players, especially in the case of second examinations. If this latter occurs the Club helps with pedagogic coaching.

The coaches regularly discuss the experiences with the teachers, if they noticed any positive changes in the students' concentration and other abilities. If they realize that the student is faint, untidy or behave in a particular way, they explore the reasons and try to help.

When the games are held farther the families living in better conditions help to transport the poorer.

The most talented are helped by mentors who play in the A team.

All of the above are very motivating moments.

The records proved that a diverse development of the student competencies takes place in practice.

The selection of qualified coaches is not easy for CSNSC. Partly only a limited number of well-qualified coaches are available, on the other hand financial reasons make it more difficult.

The managers of the club are sports lover and of creative types. Their work proved that one must dare to plan. But one must also do a lot in order to implement plans.

They regularly keep analyzing consultation to form common policies and to handle arisen conflicts. They organize consultations also for the parents and operate parent-teacher association.

The selection and talent development cannot be separated. It is not enough to recognize who has outstanding skills but talent development is even more important and more difficult task. Progression should be followed with attention to not only training theory or physiological aspects but also the education of the child is essential. The relation between the educator and the educand is permanent, it does not cease to exist when they are not together.

Coaches have to take into consideration though that the appearance and usage of pedagogical principles in competitive sports is very specific. Success reflects the importance of education and communication not only in competitions but during the selection, the development and the trainings, too.

The personality of coaches, their moral preferences influence directly the ethical level of players.

Every word, decision or gesture of the coach has significant moral effect that is the reason why the coach should set an example of the highest ethical and moral conduct.

## **Conclusions**

The most serious mistake of Hungarian football was that no improvement strategies were devised. Through sufficient financial support and well-developed educational materials, HFF experts have framed and shaped a development program of young players so that every Hungarian child could find an opportunity to demonstrate their abilities and improve their skills.

The most important outcome of the predecessors of the OTP Bank Bozsik Program was that they gave a mass base for the selection of football talent which served the development of Hungarian football in the long run and also focused on coaches' education and professional development. One can state that the Hungarian Football Development Program was a general investment into sports. The growing professionalization of the soccer field (Roderick, 2006) encourages young children to choose to devote more time and effort to develop their soccer skills.

The Program enables talented children even from the smallest settlements of the country to demonstrate their skills, and who deserve admission to the selection teams of the given age.

The presentation of CSNSC and its special implementation of OTP Bank Bozsik Program can be useful for such small youth football organisations. Its main achievement is the individual talent care by the "educator coaches".

I also wanted to get a better picture and to draw attention to the importance of pedagogical knowledge of coaches. The Program reinforced opinions that only those coaches with high-level understanding, competencies, and motivation can make changes in the sport. The results confirmed me that bigger emphasis must be put on the pedagogical knowledge learned within the football coach training. I believe that the outcomes could prove profitable for experts in football.

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## ȘTIINȚA CLUJ, THE REVELATION TEAM OF THE 1953 AND 1954 EDITIONS OF THE WOMEN'S BASKETBALL REPUBLICAN CHAMPIONSHIP

ILDIKO MANASSES<sup>1\*</sup>, ȘTEFAN MAROTI<sup>2</sup>

**ABSTRACT.** The approaching 100<sup>th</sup> anniversary of the Universitatea Club from Cluj-Napoca gives us reason to look at and reveal the accomplishments of the women's basketball team, Știința Cluj between the years 1949 – 1954. This was a reference period for the history of the basketball section of the Universitatea Club from Cluj. This research draws upon sources such as mass-media articles and other written documents. The first part of the paper focuses on the aspects that have led to the practicing of basketball in the schools and higher education institutions of Cluj and also on the events that made the women's basketball teams from Victor Babes University and Bolyai Janos University participate in local competitions. Then, the paper focuses on the remarkable results of the team and the winning of two national championships titles in 1953 and 1954.

**Keywords:** *History of sports, women's basketball, Știința Cluj*

**REZUMAT.** *Echipa „Știința Cluj”, revelația campionatului republican de baschet feminin (1953-1954).* Ne-am propus ca, acum când se apropie un secol de existență a Clubului Universitatea din Cluj-Napoca, pe baza unei documentări realizate prin intermediul unor articole de presă și a altor documente, să elaborăm o lucrare, prin intermediul căreia să facem cunoscute realizările echipei feminine de baschet Știința Cluj între anii 1949 – 1954, una din perioadele de referință în istoria secției de baschet din cadrul clubului universitar clujean. În prima parte a lucrării sunt abordate aspecte care au condus la practicarea baschetului în școlile și unitățile de învățământ superior din Cluj și la participarea echipelor feminine de baschet de la Universitatea Victor Babeș și Bolyai János în competițiile locale. În continuare, lucrarea se referă la rezultatele care au făcut posibilă cucerirea celor două titluri de campioane naționale din anii 1953 și 1954.

**Cuvinte cheie:** *istoria sportului, baschet feminin, Știința Cluj*

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<sup>1</sup> Babeș-Bolyai University, Faculty of Sport Sciences and Physical Education

<sup>2</sup> Retired

\* Corresponding Author: [ildi.manasses@gmail.com](mailto:ildi.manasses@gmail.com)



## **Introduction**

Even though it wasn't among the seven sports which were listed when the Students' Sportive Society of the Cluj University was established, basketball quickly became one of the departments with the best results. Over the years, female basketball became the sport with the most valuable accomplishments of all team sports. Despite some chapters dedicated to these results in anniversary tomes (\*\*1995; \*\*2010) and some articles published by the local and national press, these results, which should be regarded as high performances, have benefited from very little publicity. The team's supporters, especially the young ones, know very little about them, compared to how much they are worth and that they mean for the history of this successful sport.

Having this in mind, we find that the elaboration of a work which highlights reference periods in the history of successful sports, among which basketball holds a lead position, is of great interest to the supporters of this discipline, especially on the occasion of the 100th anniversary of the Universitatea Cluj Club.

This paper was written in sign of appreciation and recognition of the merits of the coaches and female players who have dedicated their best years to basketball and to this club, who have excelled in this sport and who have influenced the history of basketball in Cluj.

## **The period preceeding the great results of 1953 and 1954**

There are clues that before the First World War, as a result of a visit conducted by teachers from Transylvania to institutions of education in Budapest, students from Cluj, Oradea and other cities were introduced to the game of basketball. Also, after the basketball tournament World University Games in Budapest, the practice of basketball started spreading across the most important cities of Transylvania. Although given this situation, basketball wasn't among the constitutive sports of the Universitatea Cluj Club.

After 1945, basketball became very popular among students of Cluj. After the fusion of the basketball departments of the two universities, Victor Babes and Bolyai Janos, the women's team, having as players Bodor, Coroiu, Dan, Deák, Hirsch, Kovács, Molnár, Neagu, Pop, Salcă, Schiling, Simu, Stan, Stoica și Tasnádi took part in the local championship, without qualifying for the next level (\*\*1995).

The most remarkable performance of this period was the one accomplished in 1951, when, under the training of Francisc Barabas, the students of Victor Babes University win the first place in the Republican University Championship of the Republic of Romania (\*\* The sports annual report 1951).

### **The first big success on a national level of the female basketball team from Cluj**

After the appointment of young Alexandru Serban as coach, the women's basketball team Știința Cluj makes visible progress. As a result of a few successful transfers, the team Știința Cluj is reinforced with valuable players and as a result it becomes the champion of the city of Cluj, to the prejudice of Flamura Rosie Cluj. (Popular Sport, 17th of September 1953).

Thus the team makes it to the finals of the Women's Republican Basketball Championship together with Locomotiva Bucharest, Constructorul Bucharest, Știința Institutul de Cultură Fizică București, Progresul Oradea, Flamura Roșie Oradea, Progresul Arad, Progresul Școala Medie Tehnică de Cultură Fizică Galați, Știința Iași and Progresul Târgu Mureș, which took place between 4 – 11 of October, in Oradea (Popular Sport, 26th September 1953).

After the draw was made, Știința Cluj team was assigned to the first group, together with Locomotiva Bucharest, Constructorul Bucharest, Flamura Rosie Oradea and Știința Iasi, the latter being disqualified for not showing up. (Ghisa, 1953) Locomotiva Bucharest was the most powerful team of the group, winning all three games played, final scores: 35 – 30 with Știința Cluj, 55 – 42 with Constructorul Bucharest and 52 – 42 with Flamura Rosie Oradea, and so making its way to the first place. The second place was given to the team with the best field score percentage, considering that each of the three teams (Știința Cluj, Flacăra Rosie Oradea and Constructorul Bucharest) had gained one victory: Flamura Rosie Oradea – Știința Cluj 42 – 39 (Faklya, 6th October 1953) Constructorul Bucharest – Flamura Roșie Oradea 44 – 37 (Faklya, 7th October 1953) Știința Cluj – Constructorul Bucharest 52 – 30 (Faklya, 8th October 1953)

After overcoming great emotions, the students' team from Cluj finally got the results that won them the second place.

So, from the first group, Locomotiva Bucharest and Știința Cluj, and Știința Institutul de Cultură Fizică Bucharest and Progresul Oradea, from the second group, qualified for the semi-finals, for the positions I to IV (Faklya 8 october).

On the first day of the tournament, Știința IGC Bucharest won the game against Știința Cluj, with the score 38 – 34 (15 – 18), and Progresul Oradea defeated Locomotiva Bucharest 51 – 47 (31 – 13).

On the second day Progresul went on to beat Știința ICF 44 – 42 (15 – 19) and Știința Cluj defeated Locomotiva Bucharest 51 – 40 (28 – 25). (Faklya 10th of October 1953).

On the last day, Știința ICF won the game against Locomotiva 51 – 40 (28 – 25) and Știința Cluj went on to beat Progresul Oradea, 40 – 28 (24 – 20) the public's favourite.

Having the same number of points, the tie-break between the first three teams was decided by the score percentage. The fourth edition of the Republican Championship of Basketball ended with the players of Știința Cluj winning the gold medal, while Știința ICF Bucharest got the second place and Progresul Oradea the third place. The order of the other teams was the following: Progresul Targu-Mures, Flamura Rosie Oradea, Constructorul Bucharest, Progresul Arad and Progresul Școala Medie Tehnica de Cultura Fizica Galati (Faklya, 13th October 1953)

The players that took the team to victory were: Elza Sebestyén, Ana Albu, Elisabeta Cristea, Márta Papp, Suzana Tóth, Suzana Șerban, Georgeta Moldovan, Ana Bereczki, Frida Halmágyi, Ileana Rostaș și Éva Kiss. (The sports annual report 1953)

### **In 1954 the history repeats itself for Știința Cluj**

In 1954, the competition changed its organization, having the ten participant teams compete against each other in both home and away matches. Due to previous results, to good scores obtained in checkup games, and to the valuable players of the teams, the main favorites to win the championship were: Știința Cluj, Știința Institutul de Cultură Fizică, Progresul Oradea, Locomotiva Bucharest and Constructorul Bucharest.

Știința Cluj's players imposed their dominance throughout the whole competition. Even though none of the players stood out individually, the team was very powerful as a whole, having remarkable collective strength, solid psychological training, brave defense and a good shot score percentage, especially due to free throws. (Albulescu, 1981) The players from Cluj won all the 18 games that they played. The only games which were won by a tight score were the matches played away, with Constructorul Bucharest 40 – 39 and with Știința Institutul de Cultura Fizica Bucharest 33 – 29.

So, for the second time in a row, Știința Cluj having Alexandru Șerban as coach became the Republican champion. The players of the winning lot were: Ana Albu, Ana Bereczki, Elisabeta Cristea, Frida Halmágyi, Éva Kiss, Georgeta Moldovan Márta Papp, Ileana Rostaș, Antoanela Rădulescu, Elza Sebestyén, Suzana Șerban și Suzana Tóth (The sports annual report, 1954).

The team coached by Leon Teodorescu won the second place. The players from Știința Institutul de Cultură Fizică proved themselves to be a homogeneous team, very well trained physically and tactically, with a spectacular game, based on high-speed attack and counter-attack. It is worth mentioning that the students' team from Bucharest finished the competition with the highest score percentage 1173 – 563 and also with three victories in which it scored over one hundred points, setting the record of the championship in the game played with Știința Iasi: 117 – 18.

The third place was won by the Locomotiva Bucharest players, trained by Magda Niculescu.

## Conclusions

Compared to other sport branches, the female basketball department was established twenty five years after the sports club Universitatea Cluj was founded.

During the first years of its existence, the female basketball team went through structural changes, as well as team member changes, in what concerns players and coaches as well. It was a period of reorganization for the entire Romanian sport, not only basketball.

Throughout the first years, the students' team from Cluj played in local competitions, but without notable results. The first remarkable success was achieved in 1952, when the team won the first place in the University Republican Championship. The editions of 1953 and 1954 were once again glorious years, when Stiinta Cluj was among the national champions, with results that honour Universitatea Club.

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## VOLLEYBALL EVOLUTION. ASPECTS IN THE DEVELOPMENT OF THE ROMANIAN VOLLEYBALL

IOAN AUGUSTIN<sup>1\*</sup>, ANDREI DRAGOMIR<sup>2</sup>, ALEXANDRU MURESAN<sup>3</sup>

**ABSTRACT.** This scientific article presents the inception, evolution and the development of the volleyball game as it happened in time, due to the geopolitical and social influences. Though it appeared in the US it quickly spread worldwide due to a consistent and sustained promotion, but also brought by the US military and the First World War. Romania contributed as well to the development of the game, being a founding member of the International Federation. Nowadays volleyball still is a fashionable game, present in Olympics and all major sports competitions.

**Keywords:** *starting, evolution, development, volleyball game;*

**REZUMAT. Evoluția jocului de volei. Aspecte în dezvoltarea voleiului în România.** Acest articol științific prezintă debutul, evoluția și dezvoltarea jocului de volei, așa cum a avut loc în decursul timpului, datorită influențelor de natura geopolitică și socială. Deși a apărut în US, acesta s-a răspândit în toată lumea atât datorită promovării consistente și susținute cât și prin detașarea trupelor militare americane în decursul primului război mondial. România a contribuit și ea la dezvoltarea jocului de volei, fiind membru fondator al federației internaționale, participantă la Jocurile Olimpice și la toate competițiile majore.

**Cuvinte cheie:** *debut, evoluție, dezvoltare, jocul de volei.*

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<sup>1</sup> National University of Physical Education and Sport

<sup>2</sup> National Institute for Sport Research

<sup>3</sup> University of Babeș-Bolyai, Faculty of Physical Education and Sport

\* Corresponding Author: [ion\\_augustin@yahoo.com](mailto:ion_augustin@yahoo.com)

## **Introduction**

The current state of the volleyball game is the result of a series of actions in which different playing means and ways have been experienced in order to improve the content.

Analyzing the evolution of this game, from its origins till now, one can notice that volleyball has experienced significant transformations caused mostly by the geopolitical events at a worldwide level.

This paper aims at showing using a systemic approach the order of the most important events that contributed to defining the game that we call today volleyball. The reason why I decided to use such an approach is based both on the way sports develop and also the variety of synergies and exchanges that led to the development of the game.

Based on the theory of the systems (Radulescu et al., 1978), a system can be defined as a multitude of elements that interact with one another or with other elements in order to reach finality. Analyzing volleyball as an integrative system, having a continuous interaction with different elements, both internal and external, through merging, one can say that the game gained new qualitative properties, which led to a continuous evolution.

The objective of this paper is to ensure historical background documentation regarding the evolution of volleyball game in general, with a specific approach towards the Romanian volleyball.

Volleyball as it is today, among other factors is a consequence of a game whose evolution is due to the political and social events worldwide.

## **Methods**

Documentation was the method of study we used. This involved the study of different papers written on volleyball, studies that were about the history and the evolution of the sports field chosen for this research. More than that, a series of electronic sources on this particular theme, as well UNEFS Bucharest library collection of books on volleyball.

A considerable number of websites which provided information on the history of the volleyball game, especially from the USA have been accessed. We started from the premises that these websites can provide more accurate information from original sources dated back in the pre-electronic era.

In what concerns the Romanian volleyball, we consulted personalities from the Romanian Volleyball Federation and professors from UNEFS in Bucharest, in order to clarify the evolution of volleyball in Romania. We had discussions based on the thematic survey method.

We have studied different classical and electronic documentation sources and databases of the Romanian Volleyball Federation.

### **Documentation Results**

William G. Morgan (1870-1942), born in New York remained in history as the inventor of a game originally called "Mintonette". Morgan has been most often represented as an old man, with white hair (Fântâneau, 1981), generally speaking, the image of the inventor of the volleyball game is that of a mature man. This is an inconsistency since in 1895, when the new game was officially invented and recognized, William G. Morgan was 25 years old.

Describing his first experiments Morgan said "In search of an appropriate game, tennis occurred to me, but this required rackets, balls, a net and other equipment, so it was eliminated, but the idea of a net seemed a good one. We raised it to a height of about 6 feet, 6 inches (1.98 metres) from the ground, just above the head of an average man. We needed a ball and among those we tried was a basketball bladder, but this was too light and too slow. We therefore tried the basketball itself, which was too big and too heavy." (<http://www.fivb.org/en/volleyball/history.asp>). This note, mentioned on the official website of the International Volleyball Federation comes in contradiction with several sources of the Romanian Volleyball Federation saying that a basketball bladder would have been the first volleyball (Bădău & Tanase, 2006; Bic & Pop, 1995; Croitoru & Serban, 2002; Ghenadi, et al. 1995; Mateescu & Popescu, 1977; Murafa et al., 1963; Stroe et al., 1987) etc.

Eventually, Morgan asked A.G. Spalding & Bros to make a special new ball that was manufactured at the factory near Chicopee, Massachusetts. The ball was covered with leather, had a rubber bladder, between 25 and 27 inches (63.5-68.6 cm), weighing between 9 and 12 ounces (252-336 grams).

The first name of this new game was Mintonette. Having witnessed the demonstration and Morgan's explanations, Professor Alfred T. Halstead proposed to change the name - from Mintonette into Volley Ball, more descriptive and from the expression "to volley the ball back and forth over the net". This name was accepted by all the participants to the Springfield conference.

The rules remained the same until 1900, when Mr. W.E. Day modified them for the first time. One can notice that the accelerated popularization of volleyball in the early years has almost entirely been done by the YMCA missions that were scattered around the globe. A second role was played by the US soldiers quartered in military bases, especially in Central America and Asia.



Young Men's Christian Association (YMCA), founded 1844 by George Williams, was an association of young men, having the main objective "improvement of the spiritual condition of the young men engaged in houses of business, by the formation of Bible classes, family and social prayer meetings mutual improvement societies, or any other spiritual agency" (fig. 1) (Shedd, 1955).



**Fig. 1.** *Missionaries playing volleyball*

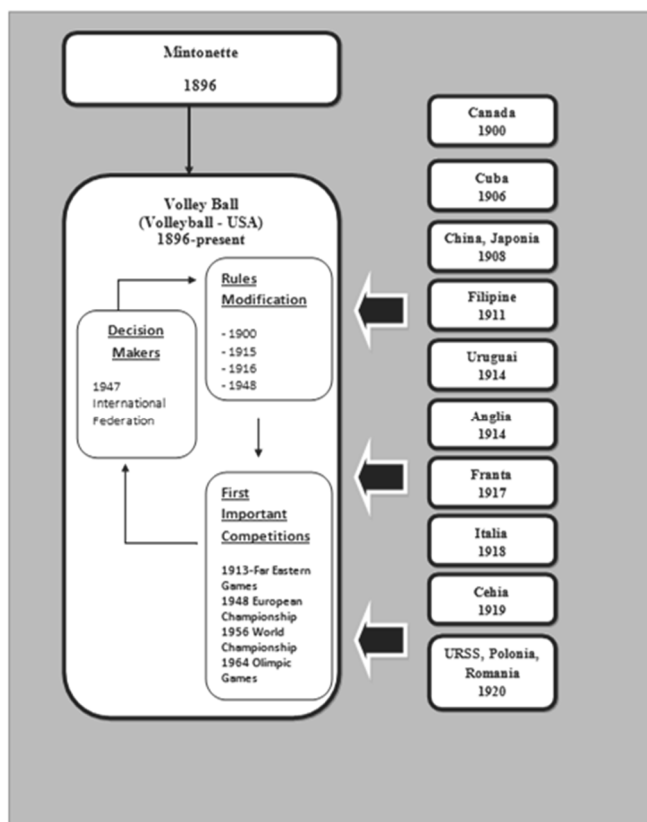
*Retrieved from <http://www.sportsknowhow.com/images/volleyball-ymca-lrg.gif>*

In 1906, Augusto York, an officer in the US army, takes part in the second military intervention of the US in the Caribbean's, and this seems to be the first contact of the volleyball game with Cuba. Two years later, in 1908, Hyozo Omori, graduate of Springfield College, demonstrates the new game on the YMCA Tokyo field. Later, in 1911 volleyball is played in China, endorsed by Max Exner and J. Howard Crokner. In Filipine volleyball was promoted by Elwood Brown, director of YMCA Manila.

In 1913 volleyball was important enough for the Asian countries to be included in the Far East Games (Panasian Games today), which was held in Manila. The games were played between teams of 16 players from China, Japan and the Filipines (<http://www.fivb.org/TheGame/ChronologicalHighlights.htm>).

Volleyball began to spread worldwide to a big extent starting with the beginning of World War I, when George Fisher, secretary of the YMCA War Office, included volleyball in the recreation and education program for American armed forces in 1914. This is why American soldiers fighting in the First World War in

Europe brought volleyball in Normandy and Brittany. The game knew a rapid growth, but became famous especially in the Eastern countries, where the climate was colder and made gym sports particularly attractive. World War I was the one which made volleyball spread to Africa, where Egypt became the first country to learn the official rules in 1915. In 1917, at the Allied Forces air base in Porto Corsini, American airmen introduced the volleyball into Italy, and thus in the Mediterranean region. In 1919, Dr. George J. Fisher, as Secretary of the YMCA War Work Office, introduced volleyball in the program of the military training camps, both in the USA and abroad, in the Athletic Handbooks written for those responsible for sport and recreation in the Army and Marines. A whole industry developed, as thousands of balls (more than 16, 000) and nets were sent overseas to the US troops and were also presented to the Allied Army's sports directors. (<http://volleydome.net/Canuck/PDF/The%20History%20of%20Volleyball.pdf>)



**Fig. 2.** Systemic approach regarding the evolution of the volleyball game.

Starting by 1914, volleyball penetrated Europe: in 1914 the first games are played in England, then in 1917 in France, in 1918 in Italy, in 1919 in Czech Republic, in 1920 in USSR, Baltic countries, Poland and Romania, in 1924 in Spain and Yugoslavia. The first national federation was founded in 1922 in the Czech Republic and Bulgaria followed quickly afterwards. The first National Championship was held in the United States, without YMCA teams (fig. 2).

One thing that is not mentioned in any Romanian sources and appears only in electronic resources is that volleyball appeared as discipline of the Olympic Games in Paris in 1924, just as a demonstrative game. ([http://www.forzaragazze.it/la\\_pallavolo/storia.php](http://www.forzaragazze.it/la_pallavolo/storia.php)).

The program included a section "American sports" and it would be interesting to mention that this edition, from 1924, is the first in which Romania had an official delegation.

In the USSR, later on, in 1933 the first National Championship was held and included over 400,000 players and the match between Moscow and Kiev was an important event of the year. We notice that at that time the game was played in many parts of the world but without a unitary set of rules to be obeyed everywhere. Each country and competition was having its own set of regulations, thus impeding the deployment of large-scale competitions. An international forum was needed to unify the rules and organize an international and competitive activity.

William G. Morgan died in 1942 at the age of 68 years, witnessing the success of his invention. On the grave stone it is simply written "inventor of volleyball".

The Summer Olympics in Tokyo in 1964 became the first edition including volleyball in its official program. In 1948 the first European Men Championships were organized in Rome and the first World Men Championships in 1949 in Prague. In parallel took place the first Women's European Championships too.

In 1947, the political and social conditions made possible the creation of an international federation. The founding members were Romania, along with France, Czechoslovakia, Poland, Egypt, Italy, Netherlands, Belgium, Portugal, Turkey, Brazil, USA, Uruguay and Yugoslavia. The main thing for the new game rules was standardizing and organizing international competitions.

The congress in 1953, held in Romania, made possible substantial improvements regarding the rules and gave great advantage of the attack, which led to the spectacular growth and creativity. On the same occasion the referees' actions and terminology were defined.

In 1956 the first World Championship held in Paris – Men and Women brought together 24 countries from 4 continents. Czechoslovakia won men's competition and USSR, the women's.

In what Romania is concerned, volleyball first entered in 1920, being introduced by the American soldiers.

In 1921 the first championship for high school teams was organized, with the participation of the teams Dimitrie Cantemir, Spiru Haret, Mihai Viteazul, Gheorghe Lazar, George Șincai and the School of Commerce.

Later, in 1931 the Romanian Volleyball Federation was established. Also in 1931 first national men's championships were organized, with the participation of: "Sportul Studentesc", "Juventus", YMCA Turda, "Viforul Dacia", Tennis-Club and "Apărătorii Patriei", who also won the first place. In 1958, after a period of changes in the name of the first national federation, it is decided to be called the Romanian Volleyball Federation and remains totally independent until today.

A successful Romanian numismatic was immortalized on the occasion of the issued and winning the European Championship in 1963 (fig. 3).



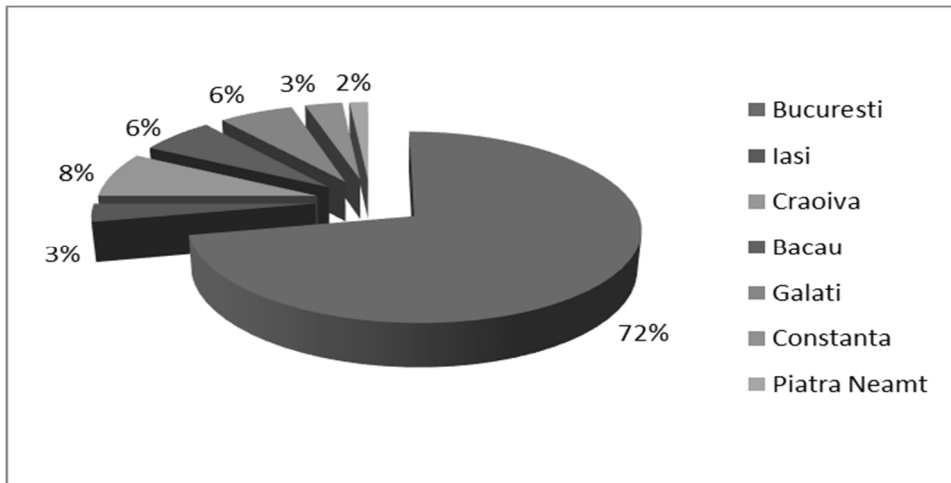
**Fig. 3.** Stamp printed during the European Championship by winning the men's Romania volleyball team

The period between 1946 and 1980 is when teams get the best Romanian sports performance internationally both club teams and national teams.

In volleyball, over time, there have been several Romanian members of governing bodies of international sports federations and international sports organizations recognized by the International Olympic Committee.

In women competition between 1950 and 2014 were played 64 editions. The only year in which Romania's National Championship wasn't played was in 1964 - when it was replaced by the RPR Cup. Between 1950 and 1969 all the titles remained in Bucharest, the percentage of champions over time is clearly in favor of the teams in Bucharest (72%).

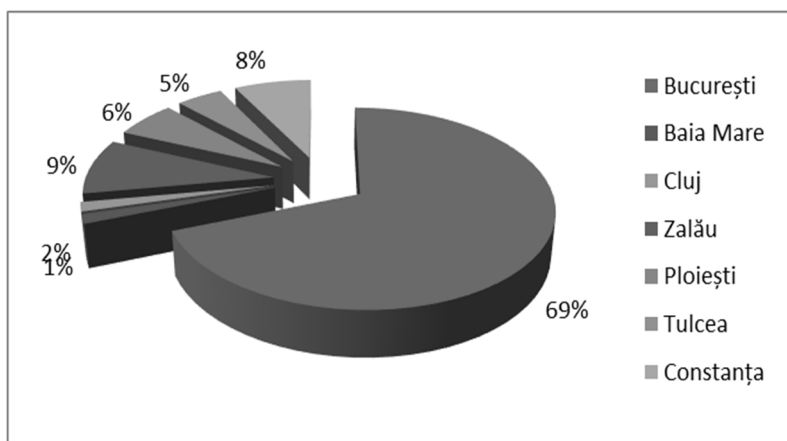
Bucharest won 46 titles; Craiova won 5 titles; Bacau and Galati won 4 titles; Iasi and Constanta won 2 titles; Piatra Neamt won 1 title (fig.4).



**Fig. 4.** Won titles in volleyball statistics between 1950 and 2014

Between 1949 and 2014 was 65 editions of Men National Championship were played, missing the 1964 edition when only RPR Cup was played. It is important to mention that between 1949 and 1992 all the titles have been won by teams from Bucharest. After this year the title was won by the teams in Bucharest only twice.

Bucuresti won 45 titles; Zalau won 6 titles; Ploiesti won 4 titles; Tulcea and Constanta won 3 titles; Baia Mare and Cluj Napoca won 1 title (fig.5).



**Fig. 5.** Statistical won the men's volleyball titles between 1949 and 2014

## Conclusions

The data collected and the sources presented create a clear frame of the context in which volleyball developed as a game. It is undoubtedly, that in the first years of its evolution, the accelerated promotion of volleyball was almost entirely due to YMCA worldwide missions. A secondary role was played by the US military in the bases located in Central America and Asia. The big expansion started with the beginning of World War I, when the secretary of the YMCA War Office included volleyball in the recreation and education program for American armed forces. Being spread world wide, volleyball developed differently in two perspectives: game rules and tactical aspects. This ended in 1947, when the International Federation was created, having 14 countries as founding members to reunite and standardize all game rules. Under these circumstances, based on the facts presented, the research study can be confirmed.

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## PROMOTION SKI TOURING IN THE VLĂDEASA MOUNTAINS

HOREA POP<sup>1\*</sup>, POP GABRIELA MARIA<sup>1</sup>, TÖRÖK ANNAMÁRIA<sup>2</sup>

**ABSTRACT.** This paper promotes ski touring and simultaneously analyze tourism potential elements for practicing this sport branches Vlădeasa. The topic subject research is interdisciplinary in nature, and the novelty is that we try to make the connection between geography, specifically side tourism potential of the area, skiing, practiced for recreation or sport, and ecology, sustainable development area. Observation method was present throughout the period of the study, materialized through spontaneous comments and observations intentional. Following field observations we obtained data about possibilities ski touring trails in the area studied. At this stage we were able to realize inventory and mapping of the field. Proposed routes are routes practicable, verified on the ground. Interview method, the process of scientific investigation, has been applied to person's skilled practitioners of this branch of the area and sports. Statistical and mathematical method is a method of measurement data and mathematical analysis allowed comparison of results. Were processed data on air temperature and snow cover. By consulting the literature, direct observations, inventory and mapping operations made in the field, and analyzed and interpreted the data collected and or made maps and photographic documentation for ski touring routes proposed by us. Media were used to study specific geographical space and land characteristics (length, inclination, presence of vegetation). Given the characteristics of skiing and results through the study area, we propose two types of routes. The first category includes trails that take place on the mountain tourist markings and the second category free ride trails that require complex technical skills, superior physical training and appropriate equipment. We conclude that Vlădeasa is an ideal place for ski touring, with many possibilities and lines of routes, with differences of up to 900 meters and 30-40° inclination of the slope.

**Keywords:** *ski touring, Vlădeasa Mountains, hiking, mountain trails*

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<sup>1</sup> Faculty of Physical Education and Sport, Babes-Bolyai University, Cluj-Napoca

<sup>2</sup> Secondary School, Huedin

\* Corresponding Author: [pophorea2005@yahoo.com](mailto:pophorea2005@yahoo.com)



**REZUMAT. *Promovarea schiului de tură în Masivul Vlădeasa.*** Lucrarea de față promovează schiului de tură și în același timp analizează elementele potențialului turistic pentru practicarea acestei ramuri sportive în Masivul Vlădeasa. Tema supusă cercetării, are un caracter de interdisciplinaritate, iar noutatea constă în faptul că se încercă să facem legătura între geografie, mai precis latura de potențial turistic a zonei, schiul de tură, practicat în scop recreativ sau sportiv, și ecologie, pentru dezvoltarea durabilă a zonei. Metoda observației a fost prezentă pe întreaga perioadă de realizare a studiului, concretizându-se prin observații spontane cât și prin observații intenționate. În urma observațiilor din teren am obținut date referitoare despre posibilități de trasee de schi de tură în arealul studiat. În această etapă am reușit să le inventariem și să realizăm cartarea pe teren. Traseele propuse sunt trasee practicabile, verificate pe teren. Metoda interviului, ca procedeu de investigație științifică, a fost aplicată persoanelor cunoscătoare ale zonei și practicanților acestei ramuri sportive. Metoda statistico-matematică este o metodă de măsurare, de analiză matematică a datelor și a permis compararea rezultatelor obținute. Au fost prelucrate date referitoare la temperatura aerului și stratului de zăpadă. Prin consultarea literaturii de specialitate, a observațiilor directe, operațiunilor de inventariere și cartografiere făcute în domeniu, sau analizat și interpretat datele colectate și sau realizat hărți și documentație fotografică pentru traseele de schi de tură propuse de noi. S-au folosit mijloace media pentru studierea spațiului geografic și a caracteristicilor specifice terenului (lungime, înclinație, prezența vegetației). Luând în considerare caracteristicile schiului de tură și rezultatele obținute prin studiul zonei, propunem două tipuri de trasee. Prima categorie include traseele care se desfășoară pe marcajele turistice ale masivului, iar a doua categorie sunt trasee de freeride (schi la liber) care necesită abilități tehnice mai complexe, pregătire fizică superioară și un echipament adecvat. Concluzionăm ca Masivul Vlădeasa, este un spațiu ideal pentru schi de tură, cu multe posibilități și linii de trasee, cu diferențe de nivel până la 900 de metri și 30-40 ° înclinația pantei.

**Cuvinte cheie:** *schi de tură, Masivul Vlădeasa, turism, trasee montane*

## Introduction

Skiing is a sport new branch in Romania, practiced for about 20 years and has seen a major development lately. Clear definition of skiing, and defining its areas is quite difficult, because there is no global unified terminology. In this paper we use the term for all forms skiing ski on skis that involves moving both climbing and descending. In English "backcountry", "freeride", "off piste" are terms

used to cause place of skiing "off-piste" (Volken, 2007). To distinguish and name a difficulty descent in the highlands (above 45° downhill slopes, terrain strewn with rocks, high avalanche danger etc.) use extreme skiing term, used by the French in 1970 "we ski extreme" (Vives, 2014).

Ski mountaineering is form of competitive skiing, sport which consists in attending, under the clock, the routes outside of the ski slopes in alpin area. In Romania term is used both skiing and ski mountaineering. Delimitation in Romania is difficult ascent and descent after the mountain. For example in the Fagaras Mountains, Bucegi, Piatra Craiului Mountains, Rodna etc. usually practiced ski mountaineering and knowledge that are required for winter mountaineering, and in the middle mountains of the country as Apuseni Mountains, Harghita Mountains etc. practiced skiing (Gingulescu & Cocean, 2011). Of all forms of tourism, mountaineering best meet the need of modern man recreation and rehabilitation of physical and mental resources, depleted everyday activities. Skiing can be practiced both as sport performance and as a leisure sport has positive effects on fitness and personal-social behaviors. A research done in the Alps (Sterlite, 2010) showed that among the main reasons of choosing skiing were: 1. Experience in nature, 2. Quiet, relaxation, recreation, 3. Sports 4. Meeting with friends and family. For 53% of 550 people surveyed, skiing is one of the most practiced activities. Skiing as a leisure sport can be considered a form of winter mountain tourism as part of the activities of active tourism. Active tourism is basic principles: high quality, responsible and sustainable management attitude that makes that activity is compatible with that context in which it is deployed. This concept is opposed to tourism 'passive', represented by mass tourism and other practices deemed to affect the environment and the local community. Interconnected with ecotourism, ecotourism and adventure tourism, active tourism adds interest of knowledge of the natural and cultural interests. This tour requires active involvement both physically and emotionally. Tourists must interact with the environment and culture of the place, to learn from them and to respect them. Skiing is a sport ethics, with minimal impact on the environment (Zaharia & Cofos, 2012). Development areas for the sport does not require the transformation of nature, the installation mechanisms climb (which can totally transform the aesthetic image of the mountain) are preferred even areas as "wild". Studies on the degree of degradation caused by mountain activities (Simpson & Terry, 2000) showed that skiing has the lowest negative effect on the environment. Practiced by relatively few people before the 70s, skiing has spread in recent years in many places around the world. The most important destinations in Europe are Italy, France, Austria, Slovakia. Although in Romania there are many regions with exceptional opportunities for ski touring, it is a popular destination in Europe.

## Research Methods

The methods used to develop the research aspect of the work were: bibliographic study, observation, interview and case study.

### Vlădeasa Mountains-study area

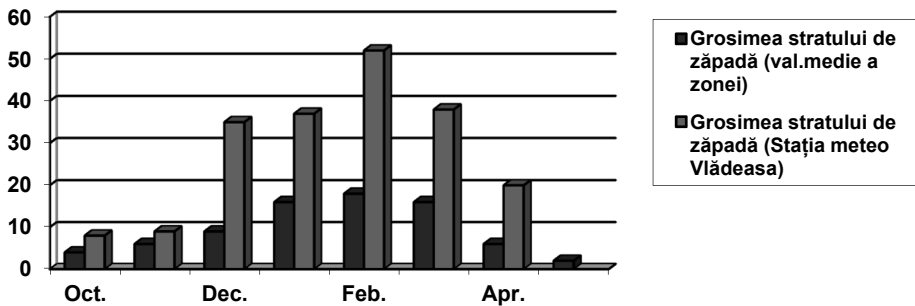
Vlădeasa Mountains component part of high central-northern Apuseni Mountains, with maximum altitudes of over 1800 m, along with Bihor and Gilău-Mountain High. It is bounded on the east drive north and west tributaries Crișului Repede, Săcuieu and Jada, north of the valley and Depression Huedin Crișului Repede and south of the headwaters of the Warm Somesul Cald Bihor massif (fig 1).



**Fig. 1.** The settlement zonal geographic Vlădeasa

Peculiarities climate creates ambience for business travel and for winter sports.

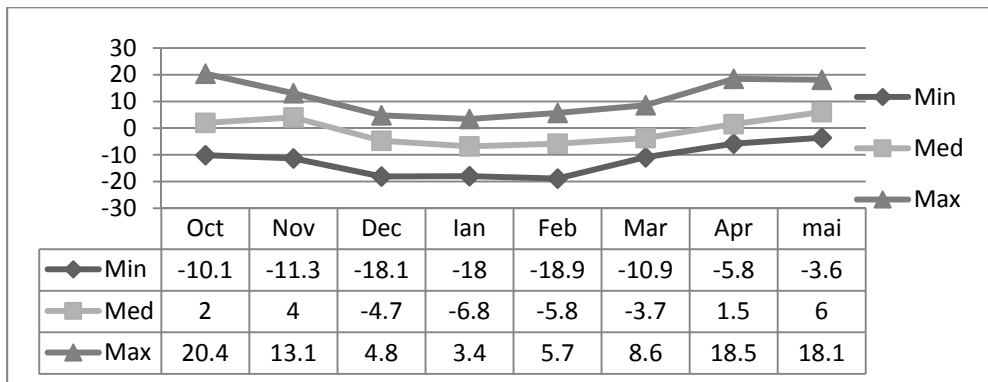
In Vlădeasa abundant rainfall, but shows great variability from year to year, some years appearing dry, and some surplus, with thickness and duration of snow cover different (Povară, 2004). In average annual and monthly precipitation values shows an altered distribution and altitudinal gradient causes orographic and circulation weather In cold season, precipitation is recorded as rain, sleet or, most commonly, snow. Between XI-III, the average amount of rainfall varies between 229.7 mm and 570.0 mm (Povară, 2004). Rainfall solid cold season, deposited a layer of snow that is maintained over a long period (October to May) in a total of 100 -190 days / year. Monday greatest thickness of snow are average January, February and March (fig. 2).



**Fig. 2.** Snow depth between the months October to May. (2010-2014)

Source: NAM- National Agency of Meteorology

Months when snow allows winter sports are generally the months from December to April, but there are years when the season starts in November (ex. in 2011) and snow can take up May (ex. in 2006) is. Wind broadly adapted relief. Intense winds and storms generate tourist discomfort sometimes limit risk. In Vlădeasa have a notable event in the perimeter of the main ridge. Statistically, 1800 Vlădeasa Station is about 25 days every year with storm, most days in winter. (Cocean, 2008). From because winds affected much and thick snow because of its transport, being usually lower on higher ridges and valleys. Due to the influence of western circulation air moisture has averaged 75-85% (Croitoru, 2002) with values. The months with lowest air temperatures were recorded in January and February (fig. 3).



**Fig. 3.** The average temperature during the months October to May. (2010-2014)

Source: NAM- National Agency of Meteorology

## **Skiing touring trails proposals in the Vlădeasa Mountains**

To achieve the research on proposals for ski touring trails in Vlădeasa we used classical methods of research in geography, which were filled with some modern methods, especially for map making. I used Google Map program, Microsoft Paint, Vlădeasa Mountains Tourist Map 1: 50,000, Dimap Publishing (2004).

Observation method was present throughout the period of the study materialized through spontaneous comments and observations intentional. Following field observations we obtained data about possibilities skiing trails in the area studied. At this stage we were able to realize inventorying and mapping the field. The proposed routes are possible routes, field trials. Routes can choose according to several criteria, depending on the length, duration, route difficulty, purpose, after the chosen area in the massif etc. We classified routes into two main groups, depending on the purpose.

The first group we named it in **Hiking trails on skis Vlădeasa Mountains** including classic tourist routes and crossing marked their winter touring skis. All descriptions are detailed, allowing completion of the route in question in winter and without the tourist marking. They are generally recommended for travelers with good physical condition, but does not require advanced technical descent.

The second group is for lovers of the routes which is important not only moving but also ski the downhill slopes looking beautiful, long, technical descents free ride type. We use call these trails, trails with emphasis on descent (free ride type) in Vlădeasa. These trails are recommended for advanced skiers. On many routes are described only Linn descent, because ascents can be combined with other routes ascents.

In describing the routes we used the model guide skiing (Baud, 2004) classifications and taking the necessary practical information, using the following:

PERIOD: shows the optimal time for completing the route, the months are written with Roman numerals.

TIME: The time required for completing the route from the starting point (is estimated, which depends heavily on the snow conditions, the physical condition of athletes, equipment weight, weather conditions, etc.)

DISTANCE: the length in kilometers of the route

DEGREE OF DIFFICULTY:

-depending in endurance routes are classified into mild, moderate or heavy

-in the technique required of "off piste"

Level 1 -beginners -the level of intermediate on slople descents on the slopes below 30°, slope dotted with a few trees, wide color, good snow conditions

Level 2 -the level of technically advanced intermediate on slope descents on the slopes below 35°, descents into the forest, different snow conditions

Level 3-advanced, descents on the slopes below 40°, descents in forests with different obstacles in narrow aisles descents, descents any snow conditions (crust, deep snow, Firn etc.)

HAZARDS – lavine, slope strewn with logs, etc.

### **Hiking trails on skis in Vlădeasa**

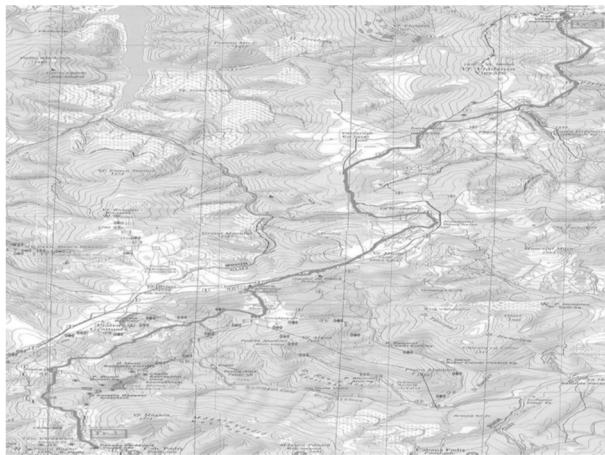
#### **Route 1. The village Bologa - Vlădeasa**

Period: -Recommended when snow along the entire length of the route, XII.-III.

Duration: 6 - 7h Distance: 21km; Degree of difficulty: Moderate / Level 1

Hazards: orientation problems may occur; Marking: blue stripe, blue cross

Access possibilities: 1 - to halt C.F.R. Bologa, on DN1 (km 539, 1), in Huedin 12.1 km; 2 - in Ciucea 10 km (Fig. 4).



**Fig 4.** Route 1-Vlădeasa Mountains Tourist Map

#### **Route 2. Drăganului Valley - cottage Vlădeasa**

Period: -Recommended when snow along the entire length of the route, XII.-III.

Duration: 4 - 4½ hours Distance: 12 km; Degree of difficulty: Moderate / Level 1

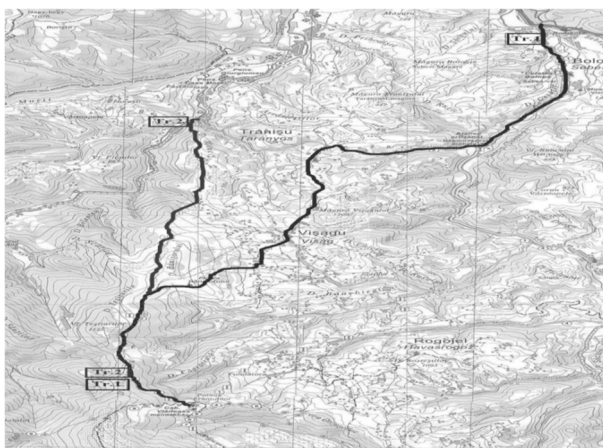
Hazards: -can occur orientation issues; Marking: blue stripe, blue cross (Fig. 5)

#### **Route 3. Vlădeasa - Stone Thief - Poiana Onceasa - cottage Vărășoia (Padis)**

Period: -for that is very long route is recommended when snow is "ideal" XII.-III.

Duration: 11:00; Distance: 38 km; Degree of difficulty: Hard / Level 2.

Hazards: -danger, wandering; Marking: blue tape, yellow tape (fig. 5).



**Fig. 5.** Route2, Route 3-Vlădeasa Mountains Tourist Map

### **Trails with an emphasis on down (tip freeride) in Vladeasa Mountains**

#### **Route 1. The village Bologa – Vlădeasa**

*Period:* -Recommended when snow along the entire length of the route, XII-III

*Duration:* 6 - 7h; *Distance:* 21km; *Degree of difficulty:* Moderate / Level 1

*Hazards:* orientation problems may occur; *Marking:* blue stripe, blue cross

*Access possibilities:* 1 - to halt C.F.R. Bologa, on DN1 (km 539, 1), in Huedin 12.1 km; 2 - in Ciucea 10 km.

**Route 2.** *Period:* XII-II; *Time:* 3 hours (first boarding 1 hour, the second hour 1.30); *Distance:* 10 km; *Degree of difficulty:* Moderate / Level 2; *Positive level difference:* 700m. *Threats:* - attention to deforestation

**Route 3.** *Period:* XII-III; *Duration:* 1.30 hours; *Distance:* 5 km; *Degree of difficulty:* Easy / Level 2; *Positive level difference:* 350m; *Threats:* - attention on the rocks and stumps valley

**Route 4.** *Period:* XII-IV; *Distance:* 2 km; *Degree of difficulty:* Easy / Level 2; *Negative level difference:* 340m; *Threats:* - attention to forest

**Route 5.** *Period:* XII-III; *Distance:* 2 km; *Degree of difficulty:* Easy / Level 2; *Negative level difference:* 300m; *Threats:* - attention to forest

**Route 6.** *Period:* XII-II; *Distance:* 3 km (downhill); *Degree of difficulty:* Medium / Level 2; *Negative level difference:* 500m; *Threats:* - attention to forest

**Route 7.** *Period:* XII-II; *Distance:* 3 km (downhill); *Degree of difficulty:* Medium / Level 2, *Level difference negative:* 500m; *Threats:* - attention to forest

**Route 8.** *Period:* XII-III; *Distance:* 3 km (downhill); *Degree of difficulty:* Medium / Level 2; Negative level difference: 400m; *Threats:* - attention to the forest and the valley

**Route 9.** *Period:* XII-III; *Distance:* 4 km (downhill); *Degree of difficulty:* Medium / Level 2; Negative level difference: 500m; *Threats:* - attention to the woods 62

**Route 10.** *Period:* XII-III; *Distance:* 3.5 km (downhill); *Degree of difficulty:* Medium / Level 2; Negative level difference: 600 m; *Threats:* - attention to forest

**Route 11.** *Period:* XII-II; *Distance:* 10 km (downhill); *Degree of difficulty:* Hard / Level 2; Negative level difference: 900 m; *Threats:* - attention to forest

## Conclusion

In our country, ski touring places are numerous. Vlădeasa is an ideal place, "a haven" for ski touring, with many possibilities and lines of routes, with differences of up to 900 meters with slopes inclined enough for skiing, peaking at 30-40°. And all this while the danger of avalanches is virtually nonexistent. After analyzing the data and the situation on the ground for Vlădeasa and taking into account specific peculiarities of skiing we proposed two groups of routes. The first group includes classical routes marked tourist routes and covering them in winter with ski touring. We proposed three routes of which two with moderate difficulty and ski technique required Level 1, and a longer route with hard difficulty and ski technique required Level 2.

The second group is of free ride routes that include beautiful slopes downhill, long and technical. We proposed 14 free ride routes, lengths, degrees of difficulty and need different ski technique.

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