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## AGE AT MENARCHE IN GREEK COMPETITIVE SWIMMERS

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ATHANASIOS SAMBANIS<sup>4</sup>, KONSTANTINOS TSITAS<sup>5,6</sup>

**ABSTRACT.** *Introduction:* We determined the age at menarche in Greek swimmers compared to a sample of age matched non athletic controls in 1986 and in 2006. *Methods:* The cross sectional sample in both studies included 12-15 year old Greek female swimmers and age matched non athletic controls. The first study, conducted in 1986, included 354 swimmers and 350 non athletic controls. The second study, conducted in 2006, included 459 swimmers and 350 non athletic controls. Data were collected from a self administered structured questionnaire was delivered to the study participants in 1986 and 2006. *Results:* Menarche age occurred earlier in swimmers ( $12.69 \pm 1.15$  years in 1986;  $11.31 \pm 0.93$  years in 2006) than in controls, but this difference was not statistically significant. In 1986, BMI was statistically higher than in controls, but this was not the case in 2006, when swimmers reported higher BMI values (20.84) compared to the 1986 study (19.86). There was evidence of a statistically significant association between age at menarche and subject's height weight and body mass index. *Conclusion:* There is a tendency for earlier onset of menstruation in swimmers, but the age at menarche in swimmers is not significantly different from non athletic controls.

**Keywords:** menarche, swimmers, training.

### Introduction

Menarche, the onset of menstruation is regulated by a variety of genetic and environmental factors especially nutritional factors or environmental exposure to chemicals that mimic estrogen (Malina, 1983; Speroff & Fritz, 2005). The determinants of the timing of menarche are many, and it is difficult to isolate a

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single factor which may delay or accelerate this event. Menarche, on average, occurs later in athletes. With few exceptions, the data are consistent across several countries. According to some authors, swimmers are also an exception to the tendency towards later menarche in athletes (Malina, 1983; Baxter-Jones & Maffulli, 2002). However, university-level swimmers in the United States in the mid 1980s and early 1990s had mean ages at menarche of 14.3 and 14.4 years (Malina, 1996).

Several studies in the literature document the late menarche in athletes compared to non athletic individuals (Malina, 1983; Brooks, Sanborn, Albrecht & Wagner, 1984; Krawczyk, Skład & Majle, 1994). In addition, other surveys report sport specific differences in menarcheal age, with gymnasts reaching menarche later than swimmers or tennis players (Baxter-Jones & Maffulli, 2002; Sambanis et al., 2003). The type of sport exerted a significant influence on subject's age of menarche (Baxter-Jones & Maffulli, 2002). Late onset of menstruation also occurs more often in those starting sport specific training before reaching menarche (Stager, Robertshaw & Miescher, 1984; Skierska, 1998). However a limited number of studies support that no significant difference exists in the menarcheal age between girls that participated and those that did not participate in sporting activities (Papadimitriou et al., 2008).

The aim of this study was to determine the age at menarche in Greek swimmers compared to a sample of age matched controls with normal daily non athletic activity in two different time periods in 1986 and 2006.

## Methods

The current study consists of two cross sectional analyses. The cross sectional sample in both studies included 12-15 years old Greek female swimmers and age matched non athletic control youngsters (n=350). The 1986 study included 354 swimmers and 350 controls, while the 2006 survey included 459 swimmers and 350 controls (Table 1).

**Table 1.** Anthropometric data presented for swimmers and controls.

	N	Age (years)	Height (cm)	Weight (kgr)	BMI
<b>SWIMMERS 1986</b>	354	13.14±1.45	165.12±8.25	63.21±5.62	19.86
<b>CONTROLS 1986</b>	350	13.45±1.13	159.10±10.35	66.10±5.90	20.51
<b>CONTROLS 2006</b>	350	12.60±0.89	160.60±9.57	64.8±6.30	21.35
<b>SWIMMERS 2006</b>	459	12.08±1.83	167.45±8.57	62.8±6.43	20.84

All participants in both studies were Caucasian from middle class families, from all over Greece. Middle class was defined according to the annual income. The procedures were approved by Aristotle's University ethics committee, and informed consent was obtained both by the participants and their parents, prior to participation in the study.

The questionnaires were self-derived and preliminarily validated in the Greek population (Karademas, Peppas & Fotiou, 2008) including questions regarding birth date, age at menarche, regularity of menses and duration of menstrual cycle. Regular menstrual cycles range from 26 to 32 days. In addition, inquiries on premenstrual and menstrual complaints were also added in the battery of questions.

Finally, questions regarding physical activity for controls and sporting history for swimmers (training volume, onset of swimming and onset of systematic training) were included. Training volume was defined as the total hours of training a week, while physical activity among controls was defined as the total hours of physical activity a week including physical education lessons and daily living walking. The questionnaires were completed by the participants with parental help.

Additionally, anthropometric characteristics (height and weight) measurements were recorded by the first author with the use of a metal tape and a digital scale. Body Mass Index (BMI) was also calculated for each participant. The BMI was calculated from an individual's weight divided by the square of the height multiplied (Marker, 1981).

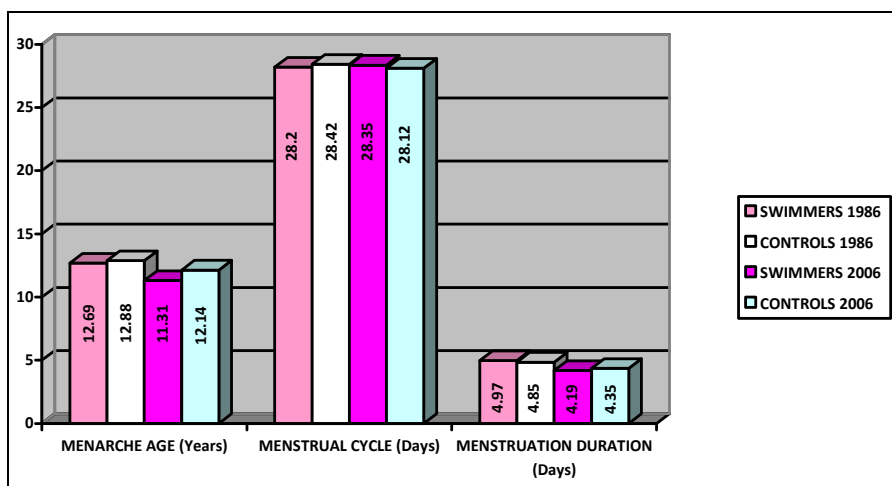
All analyses were performed using SPSS software version 16.0 (*SPSS, Evanston, Illinois USA*) results are expressed as mean (SD). Comparisons between swimmers and controls were carried out using Student's T-test for continuous data. Differences were considered significant for p values equal to or less than 0.05. Pearson correlation analysis was used to analyze continuous variables.

## Results

Anthropometric data and menstruation characteristics for study participants and control subjects in both trials are outlined on Table 1 and Figure 1 respectively.

The swimmers reported lower BMI values than controls in both studies (Table 1). Regarding the 1986 survey, the difference in BMI was statistically significant compared to that in controls ( $p < 0.05$ ). With regard to the 2006 survey, there was no statistically significant difference in BMI. The swimmers in the 2006 survey showed higher BMI values (mean=20.84) and were almost of the same height (mean=167.45±8.57 cm) with the ones in the 1986 study BMI values (mean=19.86) and were of the same height (mean=165.12±8.25 cm) respectively. The difference in BMI was statistically significant ( $p < 0.05$ ). Moreover, swimmers were significantly taller than controls in both surveys ( $p < 0.05$ ).





**Figure 1.** Menstruation characteristics reported for swimmers and controls

The athletes trained on average  $12 \pm 1$  hours per week in the 1986 study, and  $14 \pm 1.5$  hours per week in the 2006 survey. The controls reported being physically active  $4.8 \pm 2.6$  hours weekly.

Age at menarche occurred earlier in swimmers (mean= $12.69 \pm 1.15$  years in 1986 participants, and mean= $11.31 \pm 0.93$  years in 2006) than in controls, a difference which was statistically no significant. In both studies, all athletes started sport specific training before reaching menarche (mean= $10.73 \pm 1.88$  years, for 1986 swimmers and mean= $6.83 \pm 1.50$  years, for 2006 athletes). Menstrual cycles were normal in both swimmers and controls ( $p > 0.05$ ). Duration of menses did not differ significantly between athletes and controls ( $p > 0.05$ ).

There was evidence of a statistically significant association between age at menarche and subject's height ( $r = 0.388$ ,  $p = 0.001$ ). Weight and BMI were also associated with menarche age ( $r = 0.392$ ,  $p = 0.001$ ;  $r = 0.578$ ,  $p = 0.000$ ). Moreover, training hours and age of sport specific training were not associated with onset of menstruation ( $r = 0.122$ ,  $p = 0.307$ ;  $r = -0.051$ ,  $p = 0.666$ ).

## Discussion

We report on the age of menarche in Greek swimmers. The main purpose of the present study was to determine the age of menarche and to identify possible influencing factors. The mean menarche age decreased from 12.69 years and 12.88 years (1986 survey data for swimmers and control) to 11.31 years and 12.14 years respectively (2006 survey outcome for swimmers and control). This decreasing trend conforms to the well described decline in menarcheal age over the past several years (Speroff & Fritz, 2005).

Several studies document the late menarche in athletes compared to non athletic individuals (Marker, 1981; Malina, 1983; Brooks, Sanborn, Albrecht & Wagner, 1984; Stager, Robertshaw & Miescher, 1984; Stager & Halter, 1988; Malina, 1994; Krawczyk, Sklad & Majle, 1994; Baxter-Jones & Helms, 1996; Skierska, 1998; Fujii & Demura, 2005). Menarche, on average, occurs later in athletes (Malina, 1996). With few exceptions (Claessens et al., 2003), the data are consistent across several countries. According to some authors, swimmers are also an exception to the tendency towards later menarche in athletes. Menarche in swimmers tends to approximate the average for the general population (Malina, 1983; Baxter-Jones, Helms, Baines-Preece & Preece, 1994; Erlandson, Sherar, Mirwald, Maffulli & Baxter-Jones, 2008). On the contrary, other studies documented the later onset of menarche in swimmers starting training before age at menarche, than those starting training after menarche (Stager, Robertshaw & Miescher, 1984; Stager, Wigglesworth & Halter, 1990; Skierska, 1998). According to our results, onset of menarche in Greek swimmers, was earlier compared to the one reported in the literature, and approximated the average for the general Greek population. In the study, 750 senior Greek high school girls were asked through a questionnaire to report their date of menarche, participation in physical activities and their weight at menarche in two different time periods (Papadimitriou et al., 2008). According to the authors, the mean age at menarche was  $12.29 \pm 1.19$  years in 2006 and  $12.27 \pm 1.13$  in 1996. In our 1986 cohort, onset of menstruation tended to approximate the average for non-sporting controls. In the 2006 survey, although menarche age occurred earlier in swimmers than in controls this difference was not statistically significant. Additionally, our menarche outcome is consistent with previous data of swimmers, starting training after menarche (Skierska, 1998), whereas all our swimmers, in both study cohorts, started training before menarche.

This data discordance suggests that sport training per se may not be a causative factor for later menarche in female athletes. Our outcome, that training hours were not associated with early onset of menstruation in both of our surveys, favors this hypothesis. Papadimitriou et al. concluded that there was no significant difference in menarche age between Greek girls who participated and those who did not participate in sport. However, training for sport is considered as the factor responsible for later mean age at menarche in female athletes (Malina, 1994; Baxter-Jones & Helms, 1996; Vadocz, Siegel & Malina, 2002). Petridou et al. (1996) stated that various measures of moderate physical activity were associated with a delay in age at menarche. The authors postulated that an alteration of energy balance in early life through increased physical activity could delay age at menarche (Petridou et al., 1996). However, most surveys do not take into consideration other confounding factors known to influence menarche (Baxter-Jones & Maffulli, 2002). In addition, data were mainly based on cross sectional studies or retrospective menarcheal data (Claessens et al., 2003). Inferences about possible effects of training have to be based on prospective longitudinal studies (Beunen & Malina, 1996; Malina, 2000).

The standing height of young female swimmers equals or exceeds the median for the control non athletic population. Female basketball players, volleyball players, tennis players, rowers, and swimmers have mean standing height above the 50th centile of the reference populations from 10 years onwards (Malina, 1994). An epidemiologic study in Greece to ascertain whether anthropometric variables are predictors of age at menarche concluded that increased height and body mass index accelerate the occurrence of menarche (Petridou et al., 1996). Kato, Tominaga & Suzuki, (1988) investigated the underlying factors of early menarche and analyzed the relationship between menarcheal age and environmental or physical factors. The authors conducted a population based survey in Aichi prefecture in Japan. Kato et al. concluded that residence in a metropolitan area, weight and daily intakes of bread, milk and green-yellow vegetables were positively associated with early menarche. In addition, women with early menarche were taller and had higher body mass index (Kato et al., 1988). An early age of menarche is positively associated with post-menarche BMI, and negatively associated with post-menarche height. Girls with a younger age of menarche experience accelerated growth and tend to be taller and heavier when compared to later maturing girls of the same chronological age (Adair & Gordon-Larsen, 2001; Wang, 2002; Anderson, Dellal & Must, 2003; Freedman et al., 2003). Higher BMIs in childhood are associated with early ages of menarche. This is of particular concern for African-American girls, as they have higher BMIs at younger ages and experience menarche at earlier ages than Caucasian girls (Salsberry, Reagan & Pajer, 2009). According to Papadimitriou et al. (2008) there was a significant difference in the age at menarche according to the schoolgirls' perceived weight. Menarcheal age in obese girls occurred at age  $11.73 \pm 1.21$  years, in normal weight girls at  $12.29 \pm 1.21$  years, and in lean girls at  $12.42 \pm 1.14$  years. Our swimmers were significantly taller than controls in both in 1986 and 2006. Additionally, a significant correlation existed between age at menarche and subject's postmenarche height, postmenarche weight and postmenarche BMI. The fact that onset of menarche in Greek swimmers, was earlier compared to the one reported in the literature could be attributed to their increased height and BMI at that time, which was probably above the critical limit for menstruation to commence. In addition, the earlier age at menarche could be a recall bias (Koo & Rohan, 1997) or could reflect the selection of early matures into the sport (Claessens et al., 2003); in the case of swimming taller athletes are typically preferred.

This study has several limitations. Its cross-sectional design is vulnerable to information bias due to recall inaccuracies, since age at menarche was self-reported. However, great care was taken, and only those girls who could easily recall their exact age of menarche were included in the study. Moreover, recalled age at menarche is accurate enough for anthropological and epidemiologic purposes involving group comparisons (Damon, Damon, Reed & Valadian, 1969). In addition,

we did not collect information regarding maternal menarcheal age or dietary intake, and consequently we were not able to assess the impact of these factors on the onset of menstruation in the participants in the present study.

### Conclusion

Despite the above limitations, a tendency for earlier onset of menstruation in swimmers could be documented. In addition, Greek swimmers were significantly taller than controls both in 1986 and in 2006, and a positive correlation existed between menarcheal age and subject's height. The relationship of other environmental factors, such as athletes' dietary intake, to onset of menstruation has to be investigated (Malina, 1994). In conclusion, there is a tendency for earlier onset of menstruation in Greek swimmers, but the age at menarche in swimmers is not significantly different from non-athletic controls (11.31 years and 12.14 years respectively).

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## THE ROLE OF AEROBIC EXERCISES IN THE TRAINING FOR MUSCLE DEFINITION IN BODYBUILDING

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**ABSTRACT.** Physical activities daily become more important for everybody's life, so the bodybuilding can't be different. It provide a pleasure spent of the free time together with the maintaining of a healthy life, but it also give us the personal dignity and respect for ourselves. It is nice to see muscle, but is nicer to have muscle. The article is trying to prove the role aerobic exercises have in the training for muscle definition in bodybuilding and to demonstrate the benefits of it: the athlete will be healthier, more in shape and one of the most important things that a bodybuilder wants, to look even more muscular.

**Keywords:** bodybuilding; muscle definition; aerobic exercises; muscularity.

**REZUMAT. Rolul exercițiilor aerobe în antrenamentul de definire musculară în culturism.** Activitățile fizice devin pe zi ce trece din ce în ce mai importante în viața fiecărui individ, iar în mod special, culturistul nu poate fi altfel. Alături de menținerea unui stil de viață sănătos, ne oferă atât un mod plăcut de petrecere a timpului liber, cât și respectul și demnitatea personală față de noi înșine. Este plăcut să vezi mușchi, dar este și mai plăcut să îi ai. Articolul încearcă să arate rolul pe care îl joacă utilizarea exercițiilor aerobe în antrenamentul de definire musculară în culturism și să demonstreze beneficiile acestora: sportivul va fi mai sănătos, într-o formă fizică mai bună și, unul din cele mai importante lucruri pe care un culturist le dorește, să arate mult mai musculos.

**Cuvinte cheie:** culturism; definire musculară; exerciții aerobe; muscularitate.

### Introduction

In the early '80s, the attention of the bodybuilding community was drawn to the aerobic exercises, due to their benefits in terms of fat burning. Initially, this activity was used by those involved in competitions, considered as an additional

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means to gain the fat tissue while being trained for the competition. Nowadays, it has spread at such level that most part of the bodybuilders are introducing this aerobic element in their training program.

The studies carried out underline the benefits of this type of training (Mănescu, D.C. 2008):

- It is good for heart and muscle systems, as they become more efficient.
- A trained body can better extract the fatty acids, glucose and oxygen, for improving the energy input both to the brain and the muscles.
- Theoretically, the aerobic exercises can expand the capillary bed and increase the high density lipoproteins (HDL) in the blood, balance or even decrease the blood pressure, decrease the resting heart rate, increase the maximum oxygen used volume (max  $\dot{V}O_2$ ) and decrease the level of body fat.
- The improved cardiovascular function improves the resistance, which means that the training can be carried out with maximum intensity from the beginning to the end. Moreover, it shortens the resting time between sets, as another way to increase the strength.

The main goals of muscles definition period are shown below (Table 1):

**Table 1.** – The main goals of muscles definition period

The main goals of muscles definition period	<ol style="list-style-type: none"> <li>1. burning the hypodermic fat and increasing the visibility of the displayed muscle striations;</li> <li>2. increasing the protein content of the muscles by using the long and multiple repetitive sets;</li> <li>3. increasing the capillary density inside the muscles, by boosting the aerobic training volume;</li> </ol>
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By adding an aerobic component, the training program involves burning more calories. This can compensate the high deficit by using a diet that contains more calories, but maintaining in the same time the anabolic status, together with developing and striating the muscle mass.

As per the above, it is clear that practicing quality bodybuilding, which is to combine a large muscle mass with a special muscle display, is impossible without the right combination of weight-lifting training (mostly anaerobic) and aerobic-impact exercises – for burning the fat.

### **Theoretical basis**

To clearly define the boundaries between the two types of exercises, the terms aerobic and anaerobic should be analyzed properly.

Anaerobic – translated as „no oxygen”, means that the exercise intensity is so high, that the body cannot release oxygen to the worked muscles. The breathing is racing, and the lack of oxygen causes a break between the sets for compensating

the due oxygen and returning to the normal breathing. For supporting an anaerobic activity, the body needs to burn glycogen, the sugar in the body to be found in the muscles, liver and blood (Bota, C. 2000). The short duration and explosive-type of this activity (due to the fact that the involved fibers are white-type) do not allow the body to access its fat reserves to burn it and to convert it into energy.

Aerobic – meaning „with oxygen” refers to the average or low intensity efforts (especially due to the involvement of the slow and red type fibers), while the body has the opportunity to provide enough oxygen to the system during the physical activities. During this type of activity (for example, running, cycling, swimming), that can be sustained for a longer time, at the beginning, the body burns the glycogen deposits, and after draining them, it uses the fat reserves as energy source (Bota, C. 2000). The burning leads to obtaining the adipose layer and „cleaning” the toxins in the body, with a direct impact on development (synonym with separation or shaping) and quality of the muscle groups.

The aerobic system means the oxidation of the main nutritive principles inside the mitochondria for producing energy. In this way, the glucose, fatty acids and the amino acids from the food – after certain intermediary processes – are combined with the oxygen for releasing very large quantity of energy, used for transforming AMP and ADP into ATP.

Comparing this aerobic energy providing mechanism with the glycogen-lactic acid system and with the phosphates system, the maximum relative rates for generating the strength, as the equivalent of the ATP obtained in time, are the following (Demeter, A. 1979):

**Table 2.** – Maximum relative rates for generating the strength  
mols ATP/min

Aerobic system	1
Glycogen-lactic acid system	2.5
Phosphates system	4

On the other hand, if we compare the systems from the point of view of their resistance, these relative values will be the following:

**Table 3.** – Energy systems from the point of view of their resistance  
Time

Phosphates system	8 – 10 sec
Glycogen-lactic acid system	1.3 – 1.6 sec
Aerobic system	unlimited time

It is noticed that the phosphates system is the most used by the muscles for the power peaks of few seconds, and that the aerobic system is necessary for a prolonged sport activity. In the middle we can find the glycogen-lactic acid system, which is important especially to offer an additional strength during intermediary races, i.e. 200 m to 800 m running (Bompa, T.O. 2003).

The intensity – the element that differentiates the aerobic exercise and the anaerobic one is the intensity during the training. The same physical activity can be done both in aerobic and anaerobic modes. The difference between them is given by the applied intensity.

For example, running can be also done in both ways, aerobic and anaerobic, according to the used intensity. Let's consider the different levels of the intensity generated by a 100 m sprinter and a marathon runner. The sprinter is doing an anaerobic activity. He springs for the race and gives everything in just 10 seconds, almost not breathing during it. His effort is so intense that a strong lack of oxygen occurs and, after crossing the finish line, he spends the next minute breathing very fast.

On the other hand, the marathon runner does an aerobic activity. He races at such low speed – based on his physical abilities – that the oxygen continues to be supplied to the body while running, allowing him to sustain the rhythm for few hours. If he doesn't exceed his physical strength, he will finish the race with a low tiredness and without the sprinter's „drama”.

The differences between the two types of runners are to be noticed in the athletes' body-built appearance. The sprinters, as anaerobic experts, tend to have more muscles, while the marathon runners, as doing an aerobic effort, are slim and with a minimum body weight.

Why then a body builder wishes to practice aerobic exercises that can contribute to create a slim figure? The key to this question is related to the aerobic training as an additional step to the weight lifting training and not as a replacement of it. The right combination of the two is an essential step for reaching the maximum potential.

The goal of any body builder is to become „great”. A full training program includes the involvement of both types of fibers, fast and slow muscle fibers (Mănescu, D.C. 2011).

The occurrence of the fat is associated to those training periods for gaining muscle mass, when using large weights for lifting and involving the fast muscle fibers are crucial.

The issue raised is that the aerobic trainings of high intensity suppose also the involvement of rapid fibers, worked out during the weight lifting sessions. This combination will rapidly lead to exhaustion, finishing the glycogen reserves from the liver and muscles, resulting in muscle tissue losses, as the easiest material to use for energy generation at this level.

For avoiding these unpleasant issues, there is only one conclusion: the aerobic training must be carried out with an average intensity during the days between weight lifting trainings, even from the beginning of the bodybuilding program. In this way, the body structure will become definite and massive.

For obtaining the aerobic effects – to reach the necessary aerobic results (i.e. fat burning), the sessions should last around 30 minutes. As for the rhythm, the exercises must be done with a certain rhythm allowing the athlete to speak and to avoid letting him without air (Foran, B. 2001). Each aerobic session should include few warming-up minutes (5-10) and few resting minutes. Also, the rhythm must be sustained for maximum 25-30 minutes.

The aerobic exercise intensity must be enough to sustain the heart rate to 65 % of the maximum value, on the entire duration of the training (excluding the warming-up and resting times). For calculating the maximum pulse, you simply deduct the age from 220. For calculating the work-out pulse, you need to multiply the maximum rate with 0.65. The result is the heart rate that should be reached and sustained during the aerobic session.

For example, the work-out rhythm for a person of 25 is calculated as below:

$$\begin{aligned}220 - 25 &= 195 \text{ (the maximum heart rate)} \\195 \times 0.65 &= 126 \text{ (work-out rhythm)}\end{aligned}$$

When should the aerobic exercises be done? – the most efficient period of the day for the aerobic training is in the morning, right after waking up, before eating. At this time, after an 8-10 hours' sleep, when the body had not received food, the glycogen reserves are at their minimum, causing the body to faster use the energy gained by burning the fat.

Regarding the training sessions, they must be split during the week time, in the non-consecutive days. If weights lifting trainings are scheduled for three times a week, normally on Mondays, Wednesdays and Fridays, then it is recommended to have the aerobic exercises in the other days, on Tuesdays, Thursdays and Saturdays (Dumitrescu, R. 2008).

The aerobic and anaerobic trainings with weight-lifting are two different activities: the aerobics are of a low intensity, while the weight training has a high intensity. These should not be overlapped during the same training session.

If some program aspects force the athlete to have an aerobic session during the weight-lifting training day, he should try to let long periods between them – the best should be to have the aerobics in the morning and the weight-lifting training in the evening (Şerban, D. 2006).

Combining the two within the same session is non-productive for the bodybuilder goals. If combined, the two will finish up the energy reserves, physically and mentally, causing a weak body for the next weight-lifting training.

Doing an aerobic after a weight-lifting training is a trap. Immediately after a strong weight-lifting training, the body priority is the recovery. At this time, the muscle fibers start to deteriorate and the body „screams” for protein and carbohydrates infusions, for stimulating and rushing the recovery processes. Having an aerobic training after the weight-lifting one will delay the recovery – will postpone the entire recovery process, impacting the gains. In the worst case scenario, the body – already exhausted and aching for food to stimulate the repairing of the muscle fibers, with the finished glycogen reserves – it will burn the muscle tissue for energy.

Selecting the aerobic exercise type – the aerobic activities types are:

- Exercises that can be carried out in the gym or at home – fixed bike, running or walking on the treadmill, the stepper, jumping on the elastic net, inline skaters;

- Exercises carried out outdoors – walking, jogging, cycling, swimming, canoeing (rowing), roller skating.

The most important is to reach the level which allows completing three sessions per week, of 30-40 minutes each. As long as the aerobic results are reached (i.e. working-out 65% of the maximum pulse, for about 25 minutes), the way they are obtained is a secondary issue.

The human body is a very efficient system, responding to environment changes and continuously adapting to them. For example, when running (as aerobic activity), the body becomes very efficient in executing the necessary moves in this process. The more efficient the athlete becomes, bio-mechanically speaking, the more calories he will consume, and the less fat he will burnt. Therefore, it is recommended to have more types of cardio exercises (Drăgan, I. 2002).

Weight-lifting training in cardio mode is the best alternative for the muscle separation and striating period, due to the fact that the fat burning effort can be directed to those muscle groups involved in this very activity.

It is important that, for burning as much fat as possible, the muscle contraction period to be increased. In the same time, to accomplish this, the loads should be reduced to 30-50 % of 1RM. At the beginning of one set with multiple repetitions and a low load, only a limited number of muscle fibers are activated. The rest of the fibers will be activated while the first are getting tired, allowing the athlete to carrying on the effort for a longer period of time. This training, if carried out on long time sequence, exhausts the ATP/CP and glycogen reserves, leaving the fatty acids as the only one energy source available for continuing the activity. Using this type of resource leads to body fat burning, especially of the hypodermic one. This is actually the mechanism used for obtaining the development of the muscles and the increase of the muscles striating level (Sandler, D. 2005).

### Training for muscle definition

The training routine content during the definition period

Main goals:

1. Burning the hypodermic fat and increasing the display of the muscle striations;
2. Increasing the muscle protein content by using long sets with multiple repetitions;
3. Increasing the muscle capillary density by raising the work-out volume in the aerobic mode.

Work-out parameters

1. The entire duration of the definition phase: 6 weeks
2. The number of trainings during a week: 3
3. The number of muscle groups trained per session: 2-3
4. The resting time between trained muscle groups: 3 minutes
5. The number of exercises for each muscle group: 4-5
6. The resting time between exercises: 2 minutes
7. The total number of sets per exercise: 3-4
8. The resting time between sets: 1 minute
9. The total time of repetitions per set: 12-15 or maximum
10. The load used in the program: 30-50 % of 1RM
11. The training method: repetition till no more – method

**Table 4 - Loading variation model**

Continuous increase and decrease					
		80 %	80 %		
	75 %			75 %	
70 %					70 %
<b>week 1</b>	<b>week 2</b>	<b>week 3</b>	<b>week 4</b>	<b>week 5</b>	<b>week 6</b>

At the end of this phase, the subject:

- Should reach the top of his shape after the first training session.

**Table 5 - Training routine during the definition period**

	Phase duration 6 weeks	No. of trainings/ week 3	No. of groups/ session 2-3 10 3 min	No. of exercises/ group 4 10 2 min	No. of sets/ exercise 3-4 10 1 min	No. of repetitions/ set 12-15	Weight % of 1RM 30-50
Gr. m.	Exercise	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Pectorals	Push-up from prone position	A1/ 3 x max	A1/ 3 x 15R	A1/ 3 x 12R	A1/ 3 x max	A1/ 3 x 15R	A1/ 3 x 12R
	Incline push-up	A1/ 3 x max	A1/ 3 x 15R	-	-	A1/ 3 x 15R	A1/ 3 x 12R
	Decline push-up	A1/ 3 x max	-	A1/ 3 x 12R	A1/ 3 x max	-	A1/ 3 x 12R
	Lateral raises with dumbbells	-	A1/ 3 x 15R	A1/ 3 x 12R	A1/ 3 x max	A1/ 3 x 15R	-
Back	Pull-ups at helcometer	A2/ 3 x max	A2/ 3 x 15R	A2/ 3 x 12R	A2/ 3 x max	A2/ 3 x 15R	A2/ 3 x 12R
	Dead lifts with dumbbells	A2/ 3 x max	A2/ 3 x 15R	-	-	A2/ 3 x 15R	A2/ 3 x 12R
	Rowing	A2/ 3 x max	-	A2/ 3 x 12R	A2/ 3 x max	-	A2/ 3 x 12R
	Pull-over	-	A2/ 3 x 15R	A2/ 3 x 12R	A2/ 3 x max	A2/ 3 x 15R	-
Deltoid	Overhead push-ups	A3/ 3 x max	A3/ 3 x 15R	A3/ 3 x 12R	A3/ 3 x max	A3/ 3 x 15R	A3/ 3 x 12R
	Flat chest flies with dumbbell	A3/ 3 x max	A3/ 3 x 15R	-	-	A3/ 3 x 15R	A3/ 3 x 12R
	Crossing on pulleys	A3/ 3 x max	-	A3/ 3 x 12R	A3/ 3 x max	-	A3/ 3 x 12R
	Flexion with exercise bar	-	A3/ 3 x 15R	A3/ 3 x 12R	A3/ 3 x max	A3/ 3 x 15R	-
Biceps	Flexion with exercise bar	A1/ 3 x max	A1/ 3 x 15R	A1/ 3 x 12R	A1/ 3 x max	A1/ 3 x 15R	A1/ 3 x 12R
	Half squats with dumbbells	A1/ 3 x max	A1/ 3 x 15R	-	-	A1/ 3 x 15R	A1/ 3 x 12R
	Flexion with EZ bar	A1/ 3 x max	-	A1/ 3 x 12R	A1/ 3 x max	-	A1/ 3 x 12R
	Pull-ups at a fixed exercise bar	-	A1/ 3 x 15R	A1/ 3 x 12R	A1/ 3 x max	A1/ 3 x 15R	-
Triceps	Close grip pull-ups	A2/ 3 x max	A2/ 3 x 15R	A2/ 3 x 12R	A2/ 3 x max	A2/ 3 x 15R	A2/ 3 x 12R
	Parallel bars push-ups	A2/ 3 x max	A2/ 3 x 15R	-	-	A2/ 3 x 15R	A2/ 3 x 12R
	Bar extensions exercises	A2/ 3 x max	-	A2/ 3 x 12R	A2/ 3 x max	-	A2/ 3 x 12R
	Extensions at helcometer	-	A2/ 3 x 15R	A2/ 3 x 12R	A2/ 3 x max	A2/ 3 x 15R	-
Thighs	Squats	A1/ 3 x max	A1/ 3 x 15R	A1/ 3 x 12R	A1/ 3 x max	A1/ 3 x 15R	A1/ 3 x 12R
	Flexion over a bench	A1/ 3 x max	A1/ 3 x 15R	-	-	A1/ 3 x 15R	A1/ 3 x 12R
	Extension at the chair	A1/ 3 x max	-	A1/ 3 x 12R	A1/ 3 x max	-	A1/ 3 x 12R

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Phase duration 6 weeks		No. of trainings/ week 3	No. of groups/ session 2-3 10 3 min	No. of exercises/ group 4 10 2 min	No. of sets/ exercise 3-4 10 1 min	No. of repetitions/ set 12-15	Weight % of 1RM 30-50
Gr. m.	Exercise	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
	Seated leg press machine exercises	-	A1/ 3 x 15R	A1/ 3 x 12R	A1/ 3 x max	A1/ 3 x 15R	-
Calf	Push on toes	A3/ 3 x max	A3/ 3 x 15R	A3/ 3 x 12R	A3/ 3 x max	A3/ 3 x 15R	A3/ 3 x 12R
	Donkey	A3/ 3 x max	A3/ 3 x 15R	-	-	A3/ 3 x 15R	A3/ 3 x 12R
	Extensions on the press machine	A3/ 3 x max	-	A3/ 3 x 12R	A3/ 3 x max	-	A3/ 3 x 12R
	Pushing up on the press machine	-	A3/ 3 x 15R	A3/ 3 x 12R	A3/ 3 x max	A3/ 3 x 15R	-
Abdomen	Flexion over the bench	A2/ 3 x max	A2/ 3 x 15R	A2/ 3 x 12R	A2/ 3 x max	A2/ 3 x 15R	A2/ 3 x 12R
	Flexion at the machine	A2/ 3 x max	A2/ 3 x 15R	-	-	A2/ 3 x 15R	A2/ 3 x 12R
	Hanging flexion	A2/ 3 x max	-	A2/ 3 x 12R	A2/ 3 x max	-	A2/ 3 x 12R
	Crunch flexion	-	A2/ 3 x 15R	A2/ 3 x 12R	A2/ 3 x max	A2/ 3 x 15R	-

A1/ 4 x 10 R means the training 1 from week... / no. of sets x no. of repetitions Gr. m. means muscle group 1RM – one repetition maximum – is the amount of weight one can lift in a single repetition

Besides including aerobic exercise on muscle definition training, a bodybuilder should also take into account the following key pieces of advice (Castle, M.A. 2012):

- build bigger muscle – it is not possible to have muscle definition if there is no muscle development;
- perform a specific workout routine for muscle definition with those exercises to work harder the specific points of muscle insertion with the right number of sets and repeats to get ripped;
- do not use the same workout routine for more than three month because muscles adapt to exercise type and fail to develop properly;
- follow a calorie based diet – effective muscle definition diets are those based on your weight, height, sex and current activity level or lifestyle in order to give you the amount of carbohydrates, fat and proteins that your body really needs;
- even this is not essential for muscle definition, using a fat-burner product can really help; real fat-burning products are those which promote the use of body fat as an energy source;



## Conclusions

When the body adapts to the aerobic exercises, it will be more accommodated to use the fat as energy source. The metabolism will be more efficient calorie and the heart and lungs will be healthier. It will also allow more calories to be ingested without the fattening risk. The body strength will be increased and harder trainings will be more bearable. In short, the athlete will be more in shape and healthier. For the bodybuilder, the most important is that, by adhering to a constant aerobic program, his body will look even muscular.

The researches proved that the aerobic exercises noticeably influence the entire cardio-vascular system. Special information that interests the bodybuilders is related to the capillarity. Therefore, the consistent cardio work-out increases the existing capillary dimensions and generate new others.

For the bodybuilders, this benefit is obvious. The improvement of the existent capillarity, together with the expanding of the capillary system, allow a better supply with nutritive substances of the muscle tissue, which positively impacts the development and recovery, as well as the faster removal of the residual products, i.e. lactic acid, as a result of an intensive training.

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## EFFECTS OF CAFFEINE ON ATHLETIC PERFORMANCE AND ON THE HUMAN BODY

BÉLA JÓZSEF BALLA<sup>1</sup>, MELINDA MUREȘAN<sup>1</sup>

**ABSTRACT.** The effect of caffeine on the human body has been known for thousand years ago by society. In our study we tried to explore all the physiological effects of this agent. We were interested in how it influences the different forms of effort, the forms of speed, and the muscle strength. We tried to process more practical research in order to draw a correct conclusion.

We want to present the side effects what can be expected, and the World Anti-Doping Agency statement about this agent.

The amount of caffeine commonly shown to improve endurance performance is between 3 and 6 mg per kg of body weight.

Our aim is to write an overall study which provides the most basic information to the reader about the effect of caffeine on sport performance.

**Keywords:** caffeine, athletic performance, effects, strategies, intake

**REZUMAT. Efectele cafeinei asupra performanța sportivă și asupra organismului uman.** Efectul cafeinei asupra organismului uman este știut de mii de ani în urmă. În acest studiu dorim să prezentăm cât mai multe dintre efectele fiziologice, care apar în timpul investigației de cafeină. Am fost interesați de modul și măsura în care aceasta influențează diferitele forme ale efortului, formele vitezei și forța musculară. Am încercat să procesăm cât mai multe experimente pentru o concluzie corectă. Prezentăm efectele secundare, dar și afirmația Agenției Internaționale de Anti-doping.

O cantitate de cafeină indicată pentru îmbunătățirea performanței este între 3 și 6 mg/kg de greutate corporală.

Scopul nostru era scrierea unui studiu sumar, care oferă informații de bază (și nu numai) cititorilor despre efectul cafeinei asupra performanței sportive.

**Cuvinte cheie:** cafeină, performanța sportivă, efecte, strategii de utilizare, admisie

### Study Objectives

With this study we want to find answers for the following questions and to present some essential information about the correct use of caffeine.

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- I. How does the caffeine work in the human body?
- II. Can we improve our athletic performance with the use of caffeine? If yes, to what extent?
- III. Can it reduce the athletic performance and are there any side effects?
- IV. Using strategies, and caffeine as a banned substance.

## Facts About Caffeine

### *The origin of caffeine and occurrence*

Humans have consumed caffeine since the Stone Age. Many legends from different cultures have been speaking about the discovery of miracle plants including the coffee. The caffeine it spread through Europe from Turkey and Arabia. It began to show popularity in the 17<sup>th</sup> century in the European territories for their beneficial effects. (Grazian, R.,2008), (Escohotado, A., Symington, K., 1999) At the first time it was discovered and analyzed by a German chemist, Friedrich Ferdinand Runge, in 1819. (Fitbuilder, 2010)

It is found in many plant species. Common sources are coffee, tea, and to a lesser extent chocolate from cocoa beans. Less commonly used sources of caffeine include yerba mate and guarana plants, which are sometimes used in the preparation of teas and energy drinks. Mateine and guaranine are the caffeine's alternative names, derived from the names of these plants. (EDinformatics, 2010)

### *Presence in drinks and foods*

We can find a lot of sources which show us the content of caffeine on different foods and drinks. We would like to present in this paper the most frequently used products with their caffeine content.

**Table 1.** - Caffeine content of common foods and drinks (AIS, 2009)

<b>Food or Drink</b>	<b>Serve</b>	<b>Caffeine Content (mg)</b>
Instant coffee	250 ml cup	60 (12-169) <sup>a</sup>
Brewed coffee	250 ml cup	80 (40-110) <sup>a</sup>
Short black coffee/espresso	1 standard serve	107 (25-214) <sup>b</sup>
Starbucks Breakfast Blend brewed coffee	600 ml (Venti size)	415 (300-564) <sup>c</sup>
Iced coffee - Commercial Brands	500 ml bottle	30-200
Frappuccino	375 ml cup	90
Tea	250 ml cup	27 (9-51)
Iced Tea	600 ml bottle	20-40
Hot chocolate	250 ml cup	5-10
Chocolate -milk	60 g	5-15
Chocolate - dark	60 g	10-50

<b>Food or Drink</b>	<b>Serve</b>	<b>Caffeine Content (mg)</b>
Viking chocolate bar	60 g	58
Coca Cola	375 ml can	49
Pepsi Cola	375 ml can	40
Jolt soft drink	375 ml can	75
Red Bull energy drink	250 ml can	80
Red Eye Power energy drink	250 ml can	50
V Energy drink	250 ml can	50
Smart Drink - Brain fuel	250 ml can	80
Lift Plus energy drink	250 ml can	36
Lipovitan energy drink	250 ml can	50
Mother energy drink	500 ml can	160
Spike Shotgun energy drink (USA)	500 ml can	350
Fixx Extreme Ultra shot	5 ml shot	400
PowerBar caffeinated sports gel	40 g sachet	25
PowerBar double caffeinated sports gel	40 g sachet	50
PowerBar caffeinated gel blasts	60 g pouch (~9)	75
Gu caffeinated sports gel	32 g sachet	20
Carboshotz caffeinated sports gel	50 g sachet	80
PB speed sports gels	35 g sachet	40
PowerBar Performance bar with Acticaf	65 g bar	50
Extreme Sports beans - caffeine	28 g packet	50
Jolt caffeinated gum (USA)	1 stick	33
No Doz	1 tablet - Australia	100
	1 1 tablet - USA	200
Excedrin Extra strength (USA)	1 tablet	65

The caffeine content varies widely, depending on the brand, the way that the individual makes their beverage and the size of their cup. Various manufactures produce caffeine tablets (Ex: No Doz), claiming that using as pharmaceutical quality improves mental alertness. These tablets are commonly used by students, athletes, workers, and are available for everyone.

### ***The effects of caffeine in the body***

Caffeine has a wide range of actions in the human body, including hormonal, metabolic, muscular, cardiovascular, kidney, and respiratory effects. Also works on the central nervous system. It functions as a stimulant by interfering with the binding of adenosine to adenosine receptors.

Promotes the increase of dopamine and adrenalin, both stimulatory chemicals that increase energy and a sense of well being. These parallel effects allow it to function as an ergogenic aid. Simply it allows the users to do more as normal mental physical effort. (Jensen, C., 2011), (Moberly, T., 2011)

Is **absorbed** by the stomach and small intestine **within 45 to 60 minutes** of investigation and then distributed throughout all tissues of the body. The time required for the body to eliminate one-half of the total amounts of caffeine varies widely among individuals, but in a case of a healthy adult, caffeine's half-life is approximately 4.9 hours. (Teller, R., 2011)

Decreases the body's reliance on muscle glycogen, the storage form of carbohydrate, and increases its use of fat stored within the muscle for energy production. When is consumed with carbohydrate during exercises, it increases the body's absorption and use of consumed carbohydrates rather relying on use of glycogen. Both are important for sustaining endurance and for increased work production, as the body have finite carbohydrate stores but plenty of fat for energy utilization by contracting muscles. (Braun, M., 2010)

There are a number of physiological effects: the stomach acid production, the blood pressure and the pulse rate are increased, fat stores are broken down, and fatty acids are released into the blood stream. These effects can last from a few hours to as long as 12. (Jenkins, M. A., 2002)

Caffeine increases the blood flow in the kidney and at the same time inhibits the re-absorption of sodium and water. Occurring to the kidneys known as **the diuretic effect**, which provokes the need to urinate. Some specialist are saying that this diuretic effect have a negligible importance. Combined with other aspects such as dehydration and abdominal cramping, not only dehydrate the body, they can cause bowel movements and gastric distress which would obviously be detrimental to the athlete. (Clark, N., 2006), (Hartley, J., 2000)

"The caffeine may help **reduce the muscle pain**, which can impinge on performance during the exercise", says Gliottoni, based on their experiment. A caffeine ingestion of 5mg/kg body weight has been found to reduce the muscle pain in a group of subjects carrying out 30 minutes of high intensity cycling, compared to another group who had not consumed. (Gliottoni, R.C. et al., 2009)

### **How Caffeine Impacts Athletic Performance?**

There are a lot of studies on the use of caffeine for both endurance exercise and short term, higher intensity exercise. The vast majority of the studies conclude that caffeine does indeed enhance performance and makes the effort seem easier, by about 6%. More benefits noticed during endurance exercise than with shorter exercise (8 to 20 minutes) and a negligible amount for sprinters. More benefits are also noticed in athletes who rarely drink coffee. (Clark, N., 2006)

### ***Caffeine and performance in endurance (aerobic) exercises***

The researches have shown us that caffeine improves performance in individuals taking part in aerobic exercises.

In a recent review in which subjects had to run, cycle or row a set distance saw faster times recorded over the distance in individuals who consumed caffeine. This effect was seen with a moderate quantities of caffeine before and/or after during exercises. (The Institute for Scientific Information on Coffee)

A study explained individual who performed 2 hours of cycle exercises after caffeine ingestion. The caffeinated athletes generated 7.3% greater total power output. (Caffeine Aids Athlete Recovery, 2008)

The European Food Safety Authority (EFSA) recently stated that a cause and effect relationship has been established for caffeine intake and increased endurance performance, endurance capacity, and a reduction in perceived exertion. (EFSA, 2011)

### ***Endurance in short term, intense exercise***

One study showed that exercise resulted in rapid exhaustion within 6 minutes and caffeine had no effect. Two other studies demonstrated participants exercising for 15 to 20 minutes had a small increase in endurance (20 to 30 seconds) after consuming. Caffeine either has positive effects or causes no significant improvement to short term, intense exercise (McDaniel, L. et al., 2010)

Beck et al. examined the acute effects of caffeine supplementation on strength, muscular endurance, and anaerobic capacity. Resistance trained males consumed caffeine (201 mg) one hour prior to testing. A low dose of 2.1 -3.0 mg/kg of caffeine was effective for increasing bench press (2.1%). Significant changes in performance enhancement were not found for lower body strength or muscular endurance. (Beck T. W., et al., 2006) Results of the Beck et al. investigation are in contrast to a recent publication by Astorino et al. in which twenty-two resistance trained men were supplemented with 6 mg/kg of caffeine and tested on the bench press and leg press. Their findings revealed no significant increase for either bench or leg press 1RM. Astorino et al. did report a non-significant increase in repetitions and weight lifted at 60% 1RM for both the bench and leg press. (Astorino T. A., Rohmann, R. L. & Firth, K., 2008)

### ***High-intensity and team sport exercise***

Based on different researches it is apparent that moderate caffeine supplementation in the range of 4-6 mg/kg can be advantageous to either short term or intermittent/prolonged duration high-intensity performance, but only in trained athletes.

Studies revealed that acute caffeine ingestion can significantly enhance performance of prolonged, intermittent-sprint ability in competitive, team-sport athletes. (Schneiker K.T. et al., 2006), (Goldstein, E.R. et al., 2010), (Stuart G.R. et al., 2005)

### ***Tolerance, withdrawal and side effects***

In a case of a new caffeine consumer probably experience a noticeable buzz or jolt at the first time after intake a moderate dose. But if you consume that same amount of caffeine every day, after a few days (5-6), **the stimulant effects are much less obvious**, and more caffeine is necessary to achieve the same effects. It is because your body develops a tolerance or diminished response to caffeine with repeated doses. A consistent usage may lead to dependence in the body.

The withdrawal **symptoms** are present when the used certain daily intake is stopping abruptly. The most commonly reported withdrawal symptoms are: headache, fatigue, sleepiness/drowsiness, difficulty concentrating, work difficulty, irritability, depression, anxiety, flu-like symptoms, impairment in psychomotor, vigilance and cognitive performance. Dehydration is a potential concern because caffeine is a mild diuretic. (Johns Hopkins BAYWIEW Medical Center, 2003)

Withdrawal also can have a less obvious, but **detrimental impact on athletic performance**. To avoid negative effects on training, the dose should gradually reduce over 3-4 days. The symptoms peak in a day or two, and are usually completely gone within a week. If you resume caffeine intake; the symptoms usually disappear pretty quickly. (Jensen, C. D., 2010), (Moberly, T., 2011), (Colpo, A., 2010)

### ***Strategies***

Before using caffeine to improve your ability, important to talk with caregiver or nutritionist, if you do not usually drink coffee or other things with caffeine.

The amount of caffeine commonly shown to improve performance is between 3 and 6 mg/kg body mass. These amounts are equally effective when combined with carbohydrate/electrolyte solution or water. Performance improvements with caffeine are maximized with amount up to 6 mg/kg and are not generally improved with 9 mg/kg. (Colpo, A., 2010)

Louise M. Burke of the Australian Institute of Sport found that dosages as low as 1 mg/kg resulted in enhanced performance. (AIS, 2009)

According to the American College of Sports Medicine, consuming low to moderate doses of caffeine before an athletic event maximizes the benefits and minimizes the side effects. Optimal dosage is 3 to 6 milligrams per kilogram body weight. (American College of Sport Medicine) Consuming 10 to 15 mg/kg results in more pronounced side effects, which could be detrimental to athletic performance.

### **Timing:**

- Ingest 60-75 minutes before event.
- Ingest small amount during event (if carbonated, should be flat).
- Ingest small amount late in endurance event (if carbonated, should be flat).

### **Good to know** (Hammond A. L., 2011)

- The researches found that not everyone responds in the same manner to the substance.
- The impact to strength events and short sprints is unclear.
- Drinking more coffee or taking more caffeine pill does not translate into better performance.
- Anhydrous sources of caffeine, such as caffeine pills, were found more effective than coffee.
- Habitual caffeine users will not see any ergogenic effects from caffeine prior to a race.
- Caffeine is the most commonly used drug in the world.

### ***Caffeine and doping***

It has been shown that caffeine supplementation can significantly enhance performance in trained athletes. The International Olympic Committee mandates an allowable limit of 12 µg of caffeine per ml of urine. The World Anti-Doping Agency does **not deem caffeine to be a banned substance**, but has instead included it as part of the **monitoring program**. The agency removed from their list of banned substances in January 2004. (World Anti-Doping Agency, 2012)

### **Conclusions**

- ✓ Caffeine is a substance that is found in many organic compounds and is consumed in coffee, drinks, tea, tablets, and foods.
- ✓ Caffeine has a wide range of actions in the human body, including hormonal, metabolic, muscular, cardiovascular, kidney, and respiratory effects. Also works on the central nervous system.
- ✓ The studies showed clear that the caffeine has a positive effect on maximal endurance exercise and short term, higher intensity exercise, also has been shown to be very effective for enhancing time trials.
- ✓ The impact to strength events and short sprints is unclear.
- ✓ Caffeine its use as an ergogenic aid has been proven to increase physical endurance but has many side effects and precautions.
- ✓ Caffeine exerts a greater ergogenic effect when consumed in an anhydrous state (in capsule, tablet, powder form) as compared to coffee.
- ✓ Caffeine supplementation is beneficial for high-intensity exercise, including team sports.



- ✓ The scientific literature does not support caffeine-induced diuresis during exercises, or any harmful change in fluid balance that would negatively affect performance, in case of moderate doses.
- ✓ The amount of caffeine commonly shown to improve endurance performance is between 3 and 6 mg per kg of body weight.

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## THE TOUR OF THE FOOTBALL TEAM ATHLETIC CLUB ORADEA IN COUNTRIES OF WESTERN EUROPE AND NORTH AFRICA, DECEMBER 1932 – MARCH 1933

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**ABSTRACT.** At the beginning of '30, the Athletic Club Oradea, through the value of its components, through its place occupied in the hierarchy of the domestic championship, through the number of matches and the results obtained with teams from different countries, it was the best team in Romania at that time and it was the most well-known Romanian team in the Central and Western Europe. We wanted to present an important moment in the history of the Athletic Club Oradea. Based on the information found in different sources, documents from the local archives, articles in the press at that time, photos from personal albums, discussions with different people, the work approaches some issues related to the tour in 1932/ 1933 in Western Europe and North Africa. In the first part of this article, we present the context in which it has been decided the tour's organization and the way it was prepared. Foreword, the European part of the championship is approached, the games played in France and Luxembourg. Our presentation continues with the games in Morocco and Algeria. Through its duration, through the number of games played and the results obtained, this tour has been the most important one carried out up to that date by a Romanian football team. Besides its sport value, the tour had an important contribution in promoting Romanian football in countries of the Western Europe and North Africa.

**Key words:** sport history, football, Oradea

**REZUMAT.** Turneul echipei de fotbal Clubul Athletic Oradea în țări ale Europei de Vest și Africa de Nord, decembrie 1932 – martie 1933. La începutul anilor '30, Clubul Athletic Oradea, prin valoarea componentilor săi, prin locul ocupat în ierarhia campionatului intern, prin numărul întâlnirilor și a rezultatelor obținute cu echipe din diferite țări, era una din grupările cele mai bune din România și se număra printre cele mai cunoscute echipe românești în Europa Centrală și de Vest. Ne-am propus să prezentăm un moment important din istoria Clubului

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Athletic Oradea. Pe baza informațiilor aflate în diferite surse, documente din arhive locale, articole din presa vremii, fotografii din albume personale, discuții cu diferite persoane, lucrarea abordează aspecte legate de turneul din 1932/1933 în Europa de Vest și Africa de Nord. În prima parte a lucrării, autorii prezintă contextul în care s-a decis organizarea turneului și a decurs pregătirea acestuia. În continuare este abordată partea europeană a turneului, jocurile disputate în Franța și Luxemburg. Prezentarea continuă cu jocurile din Maroc și Algeria. Prin durata sa, prin numărul jocurilor disputate și rezultatele obținute, acest turneu a fost cel mai de seamă efectuat până la acea dată de o echipă de fotbal din România. Pe lângă valoarea sa sportivă, turneul a avut o contribuție importantă la promovarea fotbalului românesc în țări din Europa de Vest și Africa de Nord.

**Cuvinte cheie:** istoria sportului, fotbal, Oradea

## Introduction

After the First World War, in Europe, as a result of signing the Treaty of Versailles, the formation of the League of Nations, the victory of the Bolshevik Revolution in Russia, and under the influence of some actions that proclaimed the peoples' rights to self-determination and offer warranties for political and territorial independence of nations, (Bolintineanu & Malița, 1970) the big empires, Austro-Hungarian, Ottoman and Tzarist Russia, collapsed and disintegrated. On their ruins have occurred a series of independent states, Austria, Hungary, Czechoslovakia, the Kingdom of Serbs Croats and Slovenes, Poland, Finland, Latvia, Lithuania and Estonia, and others have extended their territory to its former extension, Romania. (Giurcăneanu, 1983)

The governments of these countries acted to consolidate the state's independence, to strengthen the national unity, to assert these countries on international level. Within these actions, besides the efforts on the political, diplomatic, economic and cultural level, sport played an important role, representing a propaganda instrument, a way of asserting and projecting country's image on international level (Kun, 1984).

Beginning with 1922, the Romanian national football team has also entered this tendency, participating in the Challenge Cup King Alexander I, in the tour of the Olympic Games in Paris, 1924, and it played more and more friendly matches with the teams representing Poland, Czechoslovakia, Turkey and Austria. (Angelescu & Cristea, 2009)

Romanian football club teams entered later in international arena. The first football club in our country that has become well-known outside country's borders was Ripensia Timisoara. Thus, under the leadership of manager Belis,

Ripensia Timisoara played numerous international football matches: Beogradski SK Belgrade, WAC Vienna, the clubs' selected team in Belgrade, in 1930, Bastya Szeged Budapest 11 Budapest, Vasas Budapest, Ujpest Budapest, Kispest Budapest, and youth selected team of Hungary, Ferencváros Budapest, Syegedi Sport Egylet, Wienar SC Vienna, FC Seté, Belgrade's selected team, in 1931. In the period 28 March and 8 May 1932, Ripensia conducted a tour in France. In 1933, the Timisoara's team toured in Southern France and in the Netherlands. (Alexiu, 1992)

The managers of the Athletic Club Oradea, one of the most valuable Romanian teams at that time, understood that this team to make a progress and that its value to be recognized abroad, it was necessary that besides the results obtained on national level, it had to have connections with the football in other countries, especially the one in Central and Western Europe.

Also, they realized before other Romanian club managers that these actions are beneficial, they contributing both in team's training and gaining competition experience for players, but also for promoting Oradea's football and Romanian football. Following the example of Ripensiei Timisoara, during 13 January and 23 February 1932, the team of the Athletic Football Club Oradea undertake a tour in France and Switzerland, besides sport results, 6 victories, 2 ties and 4 defeats, it succeeded to promote Romanian football in Europe and to ensure a financial success, both for the club and players. (Sports Arena, Oct. 5, 1936)

### **Preparing the tour**

Being encouraged by the results and successes obtained in the previous year, by the sympathy gained by the team of the Athletic Club Oradea among the spectators from France and Switzerland, by the positive appreciation of the press from these countries towards Oradea's players, Pelle János, the club's manager, Popper Ernő, the president of the football division, and Szabó Andor, together with other leaders of the group, decided that, the same as in 1933, the team should carry out a tour of training and promotion. (Nagyvárad, Oct. 13, 1932 c)

The assignment of organizing the tour in 1933 was given to Szabó Andor, helped by Székely Miklós, a good speaker of French. Connections with some representatives of different French clubs were achieved in the previous year (Nagyvárad, Dec. 4, 1931), the good relationships established with the consular legations from France (Nagyvárad, Jan. 26 1932 b) and Switzerland (Nagyvárad, Feb. 16, 1932 d), the support received from different people from Oradea settled in French towns (Heller, 1981) eased a lot the formalities in obtaining visas, the connection with the future adversaries and organize the tour.

Organizing the travelling and setting up the program started in the autumn of 1932. To succeed in this, a full correspondence was exchanged, numerous phone calls were made and a lot of telegrams were sent on the address of some French

teams from Paris, Montreuil, Lyon, Lorient, Angers, Brest, Lille, Tours, Marseille, and to the football's leaders from Luxembourg, Morocco and Algeria. (Nagyvárad, Nov. 27 1932 a)

Asking for support from senator Crisan, from Romania's affair representative in Paris, and even from the Prime Minister Iuliu Maniu, the collective passport and the necessary visas were obtained for all the members of the delegation. (Nagyvárad, Dec. 14, 1932 g)

### **The European part of the tour. France and Luxembourg**

On Wednesday evening, Dec. 14 1932, the delegation of the Athletic Club Oradea, conducted by Szabó Andor, having in its component the following players Czinczér István, Bartha Iosif, Rummer, Chiroiu II Vasile, Braun Coloman, Moravátz Iosif, Glanczmann Andrei, Kovács Miklós, Rónnay Francisc, Kocsis Elemér, Chiroiu I, Roșculeț Nicolae, Takács și Kráusz Andrei, left with the fast train of Budapest to France. (Nagyvárad, Dec. 15, 1932 e)

In the first part of the tour, 18 December 1932 – 5 January 1933, the Athletic Club Oradea, played 7 matches with Red Star - Club Francais Paris, FC Montreuil, Racing Lenois, FC Angers, FC Lorientaise, Brestoise, Olympique Lille, all ending with the victory of Oradea's team.

In Luxembourg, the delegation of the Athletic Club Oradea had a great reception. Sport articles from newspapers made an eulogistic presentation of Oradea's team, recalling some of the results obtained by the team on international level, 3 - 2 with WAC Vienna, 1 - 0 with Amateur Vienna, 4 - 2 with Ferencváros Budapest, 2 - 2 with Nemzeti Budapest, 6 - 2 with III-ik Kerület Budapest, 2 - 0 with Bocskay Debrecen and 3 - 1 with Slavia Prague. (Nagyvárad, Jan 8. 1933 d). Delegation's members were visited by the Romanian Consul in Luxembourg. After the match won with 5 - 1 (3 - 0) against the Luxembourg's team, the local newspapers wrote on Sunday, January 8, that the people from Luxembourg had the privilege to be fascinated by the beautiful game of Oradea's team. (Nagyvárad, Jan. 10, 1933 e)

The Tour continued with two games in mainland France, 13 - 0 with FC Tours, 3 - 3 with Olympique Marseille, and a match on the island of Corsica, 10 - 0 with the Ajaccio's team (Nagyvárad, Jan. 28, 1933 a). Thus, the first tour ended with a special balance. In the 11 games disputed, the Athletic Club Oradea obtained 10 victories and 1 tie.

As an appreciation of this tour, and due to the fact that the Athletic Club Oradea had an important role in promoting Romanian football and image in these countries, Oradea's delegation was supported by Romania's affair representative in France and Romania's Consul in Luxembourg. (Nagyvárad, Jan. 8, 1933 d)

### **The second part of the tour. The matches in Morocco and Algeria**

From Corsica, the delegation of the Athletic Club Oradea, travelled by boat in North Africa, where it played 12 matches in Morocco and Algeria. In Morocco, Oradea's team continued the series of evolutions appreciated by the spectators, who knew very well this game especially that, in the previous years, there have been touring teams from countries with a developed football, France, Hungary and others. ( Dec. 20, 1932 f) Among the adversaries encountered there were North Morocco's team, 2 - 0, Rabat's team, 4 - 1, Casablanca's team, 3 - 2, national team of Morocco, 3 - 2. (Nagyvárad, Feb. 16, 1933 b)

Beginning with 17 February 1933, the tour continued in Algeria, where the Athletic Club Oradea played the Maskara, 1 - 1, and Sidi - Bell - Abbes, 7 - 0, making here, through its playing and the results obtained a good propaganda for Romanian football. (Nagyvárad, Feb. 25, 1933 g)

### **Tour's final**

Coming back in Europe, the team of the Athletic Club Oradea met Gallia Sport Perreguaise, winning with 3 - 2. (Nagyvárad, Feb. 28, 1933 f)

Through its duration, the number of matches and the results obtained, this was the longest and the most important tour performed at that time by a Romanian football team. Its balance was a success, both on sport and financial plan and under the aspect of promoting Oradea's team and Romanian football. The tour took place during 14 December 1932 and 6 March 1933. During this time, the football team of the Athletic Club Oradea played in 4 countries, meeting with the national teams of Luxembourg and Morocco, local teams and club teams in France, Morocco and Algeria. From 25 matches played, Oradea's tea, won 21 and obtained 4 ties, having a goal average of 110 goals scored and only 25 goals received. For Oradea's team, the tour, besides the indisputable sport value, through 120.000 Lei that entered the club's account and the bonuses between 20.000 and 30.000 Lei paid to each player, it also represented a financial success. (Arena Sporturilor, Oct. 5, 1936)

Returning in the country, on Monday, 6 March 1933, the delegation of the Athletic Club Oradea was waited in the train station by thousand of enthusiast supporters. Players, coach and the tour's leaders were welcomed by dr. Pelle János, the president of the Athletic Club Oradea and the local council person, by Oradea's sport leaders, among which Löwenstein Rezső, the president of the Association Physical Culture of Workers Perseverance Oradea, Poenaru Bordea, the president of Crişana Club Oradea. (Nagyvárad, Mar. 7, 1933 c)

Short after the return in the country, as a gesture of recognition, appreciation and reward for the way the team performed, for the results obtained and for the contribution they had for the promotion of the club and of Romanian



football, the management of the Athletic Club Oradea celebrated this special event in the club's history. To the banquet that took place on the evening of 9 March, 350 guests participated. Alongside the sports, their family members, supporters of the football team, the event was honoured by the presence of representatives of the local administration, managers of the most important sport clubs in Oradea, members of the Newspapermen' Club from Oradea.

### Conclusions

The tours of the Romanian football teams at the end of '20 and beginning of '30 were among the efforts made on sport level to affirm Romania on the international arena and to project Romania's image abroad.

This tour represented a continuation of the actions that targeted the diversification in players' training, enriching the international competition calendar, promoting Oradea's team and Romanian football.

Through its duration, 14 December 1932 – 6 March 1933, through its 25 matches played in France, Luxembourg, Morocco, and Algeria, through its results obtained, 21 victories and 4 ties, this action represented the longest tour a Romanian football team undertook at that time.

Team's playing, the results obtained made the tour to be a success, also expressed by the sympathy showed by the public which followed the team's evolution, by the appreciation made the press in those countries.

Besides its sport value and as a promoting action, the tour represented, through the sum of money that entered the club's account and through the sums paid to players, a great financial success.

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- \*\*\* *A NAC Franciaországban!* (ACO in France!), in: Nagyvárad, LXI-ik évfolyam, 282 sz., péntek, december 4, 1931: 8.
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- \*\*\* *A NAC ragyogó szereplése Genfben* (The shining evolution of ACO in Geneva), in: Nagyvárad, LXII-ik évfolyam, február 16 1932 d: 5.
- \*\*\* *A napoleon szülővárosára Waterlooi vereséget mért a zöld-fehér gárda ...* (The green-white team won like in Waterloo against Napoleon's birth town...), in: Nagyvárad, LXIII-ik évfolyam, 22 sz., szombat, január 28, 1933 a: 7.
- \*\*\* *Folytatódik a NAC turálya* (ACO continuing the tour), in: Nagyvárad, LXIII-ik évfolyam, 38 sz. csütörtök, február 16 1933 b: 5.
- \*\*\* *Elindult a gárda* (The guard started), in: Nagyvárad, LXII-ik évfolyam, 287 sz., csütörtök, december 15, 1932 e: 7
- \*\*\* *Ezrek várták a vasútállomáson a NAC tegnap delután hazaérkezett dicsőséges turacapatát* (Thousands welcomed the ACO team in the train station in Oradea, which returned from its glorious tour), in: Nagyvárad, LXIII-ik évfolyam, 54 sz., kedd, március 7, 1933 c: 7
- \*\*\* *Hogyan reklámozza Luxemburg a NAC-ot* (How Louxemburg advertises ACO), in: Nagyvárad, LXIII-ik évfolyam, 6 sz., január 8, 1933 d: 15.
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- \* \* \* *Tovább hengerel a zöld-fehér moydony...* (Green-white engine rolls over...), in: Nagyvárád, LXIII-ik évfolyam, 46 sz., szombat, február 25, 1933 g: 4.
- \* \* \* *Turneele echipei CAO* (The tours of the ACO team), Sport Arena, 5 October, year I, no. 3 1936: 3.

## **HISTORICAL APPROACH OF HEART RATE AND PERIPHERAL PULSE RECORDING (A DIACHRONIC APPROACH FROM THE FIRST NOTES TO THE TECHNOLOGY OF 2013)**

**REMUS-CRISTIAN VĂIDĂHĂZAN<sup>1</sup>**

**ABSTRACT.** For thousands of years people are concerned to understand the operation of the most complex "machine" that exists on earth. For hundreds of years physiologists monitor heart sounds and interpret them to understand and anticipate the best influences that "the engine" has upon each organ of the human body, both individually and to the whole. A good anticipation of heart function is useful for everyday life, especially for applications required in physical activities. Heart rate is the parameter that we are interested primarily in physical activities because it changes directly proportional to level of effort (Derevenco, 1998), being the most rapid adjustment mechanism to the level of effort (Pufulete, 2002, p. 105). The first historical reference related with the working frequency of the heart is connected with the name of a doctor, who lived in the age of pyramids, Imhotep (Fig. 1) (roughly around 2600 BC) (Zăgrean, 1993, p. 15). After a trip through history heart rate recording we arrive to 2013. Now-a-days heart rate recording is performed with a wide range of instruments with a high accuracy for recorded data. I use a system consisting of heart rate monitor synchronized with specific software installed on my phone. After training is complete, the file containing the data taken during the session will be synchronized with your personal account on Sports Tracker site. From this account data will be exported into a file ending in '.gpx' which contains the heart rate profile during exercise session. The file '.gpx' will be imported into SportTracks program and will be processed with the tools offered by this software.

**Key words:** heart rate, pulse, history, record, technology.

**REZUMAT. Istoricul înregistrării frecvenței cardiace și a pulsului periferic (o abordare diacronică de la primele însemnări până la tehnologia anului 2013).** De mii de ani oamenii sunt preocupați să înțeleagă funcționarea celei mai complexe „mașini” care există pe pământ. De sute de ani fiziologii monitorizează sunetele inimii și le interpretează pentru a înțelege și a anticipa cât mai bine

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influențele pe care le are „motorășul” corpului uman atât asupra fiecărui organ în parte, cât și asupra întregului. O anticipare cât mai bună a funcțiilor inimii este de real folos pentru viața de zi cu zi, dar mai ales pentru aplicațiile atât de necesare în domeniul activităților fizice. Frecvența cardiacă este parametrul care ne interesează, în primul rând, în cadrul activităților fizice deoarece ea se modifică direct proporțional cu mărimea efortului (Derevenco, 1998), fiind cel mai rapid mecanism de adaptare la efort (Pufulete, 2002, p. 105). Prima referință care apare în istorie cu privire la frecvența cu care inima funcționează este legată de numele unui medic care a trăit în epoca piramidelor, Imhotep (aproximativ în jurul anului 2600 î.e.n.) (Zăgrean, 1993). După o incursiune prin istoricul înregistrării frecvenței cardiace ajungem în 2013. În această perioadă înregistrarea frecvenței cardiace se realizează cu o gamă foarte variată de aparate care au o precizie mare privind fidelitatea datelor înregistrate. Eu folosesc un sistem format dintr-un monitor de frecvență cardiacă sincronizat cu un program instalat pe telefon. După ce se încheie antrenamentul, fișierul care conține datele prelevate în timpul sesiunii de lucru va fi sincronizat cu contul personal de pe site-ul sports-tracker. Din acest cont datele vor fi exportate într-un fișier cu terminația '.gpx' care conține și profilul frecvenței cardiace din timpul antrenamentului. Fișierul '.gpx' va fi importat în programul SportTracks și va fi prelucrat cu instrumentele oferite de acesta.

**Cuvinte cheie:** frecvență cardiacă, puls, istoric, înregistrare, tehnologie.

For thousands of years people are concerned to understand the operation of the most complex "machine" that exists on earth. For hundreds of years physiologists monitor heart sounds and interpret them to understand and anticipate the best influences that "the engine" has upon each organ of the human body, both individually and to the whole. A good anticipation of heart function is useful for everyday life, especially for applications required in physical activities.

The recognized heart functional parameters are cardiac output, systolic flow and heart rate (Derevenco, 1998). "Heart rate is the number of heart beats per minute" (Derevenco, 1998, p. 40). Peripheral pulse is a pulsatile wave propagated from the heart to the periphery. "Pulsating wave is an energy wave that propagates through the vascular wall, step by step, generated by pressure oscillations that occur as a result of the force developed by contractions of the heart" (Gusti, 1989, p. 128).

Heart rate is the parameter that we are interested primarily in physical activities because it changes directly proportional to level of effort (Derevenco, 1998), being the most rapid adjustment mechanism to the level of effort (Pufulete, 2002, p. 105).

The first historical reference related with the working frequency of the heart is connected with the name of a doctor, who lived in the age of pyramids, Imhotep (Fig. 1) (roughly around 2600 BC). He admitted "the peripheral pulse as a result of heart force" and recommended techniques of examination for this peripheral pulse (Zăgrean, 1993, p. 15).

History does not specify such other notes until Aristotle who, in turn, acknowledged that "pulse was the result of the continuous beating of the heart" (Bârsu, 2007, p. 13). Aristotle (384-322 BC) made observations on changes in heart rate in different states of the body, such as: fear, hope, agony (Bârsu, 2007).

Roughly between 335-280 BC was made the first pulse recording of the human heart. It belongs to Herophilos, Greek scientist who observed that the arteries pulsate rhythmically (Billman, 2011). He analyzed the pulse rate using a water clepsydra (Bedford, 1951; Bay & Bay, 2010, quoted by Billman, 2011, p. 2). Herophilos listed many pulse features: "amplitude, speed, strength and rhythm" (Bârsu, 2007, p. 15).

In our era, Archigenes, in the first century, was the first to describe the regularity and irregularity of pulse, noting eight features for it (Bedford, 1951 quoted by Billman, 2011, p. 2). Also Archigenes stated as being dangerous a powerful and frequent pulse (Ionescu, 1987).

In the second century AD, Rufus of Ephesus was first to argue that the pulse is caused by the contraction and relaxation of the heart (Bedford, 1951 quoted by Billman, 2011, p. 2). In India, in the same century, Charaka wrote about synchronicity between pulse and heartbeat (Zăgrean, 1993). He said that "pulse disappears when death comes" (Zăgrean, 1993, p. 114).

The most famous ancient Greek scientist was the doctor Galen of Pergamon (he lived between 131-200 AD) who wrote at least 18 books on pulse (Billman, 2011). Greek doctor said that the arteries are filled with blood when the heart contracts and marks its dilatation by beatings (Ionescu, 1987), and "arterial pulsation is due to a contraction property of a structure found in the arterial wall" (Bârsu, 2007, p. 17).



**Fig. 1.** Statue of Imhotep in the Louvre (Wikipedia, 2013)



**Fig. 2.** Galen of Pergamon (Wikipedia, 2013)

To analyze movements pressure, Galen introduced a tube into an artery and concluded that the pulsations come from the heart (Ionescu, 1987).

Regarding the measurement of pulse, Greek physician recommended that this has to be done by counting at least 100 beats (Zăgrean, 1993). Galen also explained that the pulse undergoes qualitative changes with age (Zăgrean, 1993).

The Greek physician was the first one to observe and note the effects of exercise on the heart in the book "The Pulse for Beginners" (Billman, 2011, p. 2). He advocated the usefulness of exercise, including the therapeutic process based on exercise (Derevenco, 1998).

In 1450 was presented the first method of counting the pulse by a Catholic monk, his name Nicholas Krebs (Zăgrean, 1993).

Sanctorius (1561-1636) recorded pulse variations that has been done with a tool made by him and named pulsilogium (Bârsu, 2007).

John Floyer (1649-1737) "determined heart rate per time unit and he built a special watch for this" (Bârsu, 2007, p. 58). This watch that help to measure pulse was first of its kind (Floyer, 1707 quoted by Billman, 2011, p. 3). With this watch it has been recorded both pulse and respiration in different circumstances (Billman, 2011).

Floyer analyzed pulse behavior in various circumstances, including those where the body is subjected to effort and he established normal heart rate to 100 beats / minute, describing several characteristics of pulse (Zăgrean, 1993).

Around the same time that Floyer lived, James Keil (1673-1719) "calculated mechanical strength of the heart" (Bârsu, 2007, p. 60).

In 1733, Stephen Hales noted that variation of pulse is related with respiratory cycle (Hales, 1733 quoted by Billman, 2011, p. 3).

After he invented the smoke kymograph (mechanical device that recorded movements on a drum), German physiologist Carl Ludwig noted in 1847 that the pulse is accelerated by inspiration and it is reducing by expiration (Berntson et al., 1997).

In 1854, Karl Vierordt (1818-1884) invented a more accurate pulse recording device, called sphygmograph (Bârsu, 2007). A variant of sphygmograph was designed in 1860 by Etienne-Jules Marey, too (Bârsu, 2007).

The first scientist who recorded the electrical activity of the heart was Willem Einthoven in 1895 (Einthoven, 1895; Katz and Hellerstein, 1982; Hurst, 1998 quoted by Billman, 2011, p. 3).

In 1897, Sir James MacKenzie (1853-1925) "imagined a polygraph which simultaneously recorded arterial and venous pulse" (Fig. 3) (Bârsu, 2007, p. 95).

The nineteenth century, especially the second half, came to be defined by the invention of many methods used for recording the pulse graphic (Zăgrean, 1993).

There was, in 1961, the portable electrocardiograph for periods of time up to 24 hours, realized by Norman Holter (Holter, 1961 quoted by Billman, 2011, p. 3).

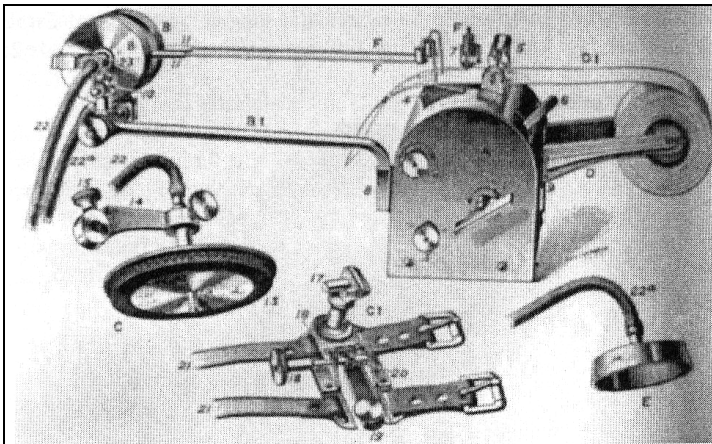
In 1983, Polar Electro invented the first wireless transmission electrocardiograph (between the ring electrode and receiver): Polar Sport tester PE 2000 (Parker, 2007).

It began, thereby, the portable heart rate monitors era. They were developed continuously, modifying their performance at a very fast pace.

Such a device consists of a belt with electrodes that is positioned on the chest. These electrodes monitor the electrical activity of the heart and transmit information by radio signal to receiver that calculates heart rate per minute. This receiver can be a device like a clock attached to the human forearm, or can be any type of device (phone, tablet) that has Bluetooth function and software designed for decoding signals received. Professional equipments have the signal between the belt and the receiver encoded to prevent interference by neighboring devices (Parker, 2007).

These devices which monitor heart rate allow the user to read real-time heart rate value. They are very useful for real-time monitoring exercise intensity levels.

The system used by me for Ph.D. research consists in one belt with Bluetooth transmitter, Polar brand, one phone (Smartphone) with Bluetooth and specific software for reception, analysis and interpretation of heart rate data.



**Fig. 3.** The polygraph of Sir James MacKenzie (Bârsu, 2007, p. 96)

To be more specific, my system includes:

- Polar WearLink® + transmitter with Bluetooth® (Polar, 2013) (Fig. 4)
- Smartphone Samsung Xcover GT-S5690 (Samsung, 2013) (Fig. 5)
- Phone software for Android, Sports Tracker (Sports Tracking Technologies Ltd., 2013) (Fig. 6)



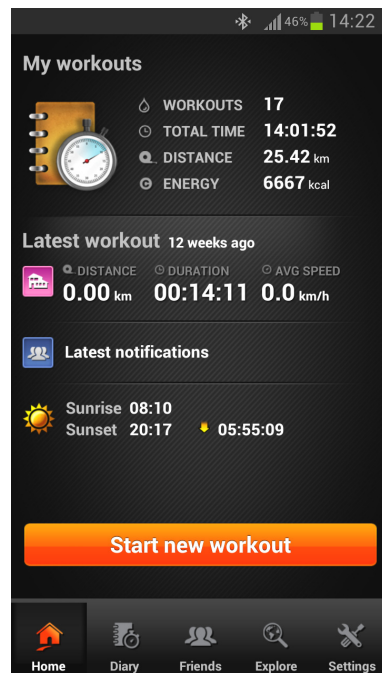
- PC software for Windows XP, SportTracks (Zone Five Software LLC, 2013)  
(Fig. 7).



**Fig. 4.** Polar WearLink® + transmitter with Bluetooth® (Polar, 2013)



**Fig. 5.** Samsung Xcover GT-S5690  
(Samsung, 2013)



**Fig. 6.** Sports Tracker for Android

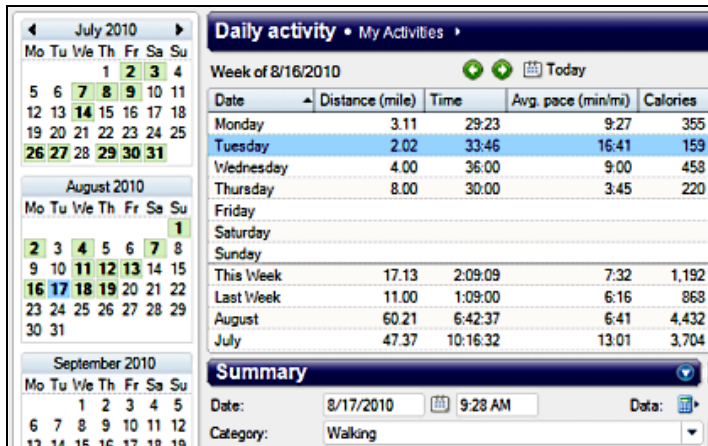


Fig. 7. SportTracks for Windows XP (Zone Five Software LLC, 2013)

Heart rate monitor records the activity of heart and sends information to receiver with which was synchronized. Synchronization is done by the software installed on the receiver and has a key consisting of '0000' (heart rate belt specific key).

The software installed on my phone analyzes information and includes it in the settings that the user has chosen. These settings are provided through the possibilities created by the software developer. The Sports Tracker for Android offers (Google, 2013):

- Track and analyze your performances, monitor your progress
- Store all training data in your personal workout diary
- Keep track of everything from calories burned to average training speed and altitude
- Use maps, time and distance calculators
- Get voice feedback during training
- Share workout data and photos with other trackers on Sports Tracker, Facebook and Twitter
- See your friends' profiles and comment their workouts and photos
- Explore the globe to discover new routes, trails and adventures worldwide

PC software for Windows XP offers (Zone Five Software LLC, 2013):

- GPS import or manual workout entry
- Show GPS routes with street, topo & satellite maps
- Chart workout trends over time

- Detail pace, elevation, and heart rate graphs
- Dynamic split time, distance and pace analysis
- User-defined workout categories and custom data
- Edit GPS routes or HR info to fix bad data
- Equipment (shoe) mileage and use tracking
- Complete control of your data, stored on your PC

After training is complete, the file containing the data taken during the session will be synchronized with your personal account on Sports Tracker site. From this account data will be exported into a file ending in '.gpx' which contains the heart rate profile during exercise session. The file '.gpx' will be imported into SportTracks program and will be processed with the tools offered by this software.

I highly recommend the use of my system because this is a system that allows high maneuverability of the recorded data. The recorded data can be processed and analyzed with high precision and multiple details. Also, this system is inexpensive and costs, depending on the cell used, less than 230 € (1000 RON).

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## PREVENTION AND CORRECTION OF POSTURE BY MEANS SPECIFIC TO SPORT GAMES

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**ABSTRACT.** Unfortunately there is a growing incidence of incorrect posture. Wrong posture's prevention and primary prevention is achieved by maintaining a correct attitude of the body by self-control, both in daily, school and professional activities. Correction of the wrong postures is complex and depends on the scope form, its severity, age, sex, temperament, level of training, etc. associated diseases. Kinetic programs that we used consisted of corrective exercises, analytical exercises and general physical conditioning that provides the formation of an accurate sense of attire. From the wide range of possibilities offered by the movement as remedy of deficiencies in posture we synthesized different working techniques, individualizing programs based on their effectiveness in kinetics. Kinetic programs used were individualized in terms of the systematical resources used and of the method of implementation of specific motor acts.

**Keywords:** posture, deficiency, kinetic means, sport games.

**REZUMAT. Prevenirea și corectarea deficiențelor de postură prin mijloace specifice jocurilor sportive.** Din nefericire există o incidență tot mai ridicată a posturii incorecte. Prevenirea apariției deposturărilor reprezintă profilaxia primară și se realizează prin menținerea unei atitudini corecte a corpului prin autocontrol, atât în activitățile cotidiene cât și în cele școlare, profesionale. Corecția posturii este complexă și depinde de întinderea, greutatea lor, dar și de vârstă, sex, temperament, grad de antrenament, boli asociate etc. Programele kinetice pe care le-am folosit au cuprins exerciții fizice corective, exerciții analitice și cele pentru condiționare fizică generală care asigură formarea simțului ținutei corecte. Programele kinetice folosite au fost individualizate sub raportul sistemului de mijloace utilizat și al modalităților de execuție a actelor motrice specifice. Din gama largă a posibilităților pe care le oferă mișcarea ca remediu al deficiențelor de postură am sintetizat diferite tehnici de lucru, individualizând programele kinetice în funcție de eficacitățile lor.

**Cuvinte cheie:** postură, deficiență, mijloace, jocuri sportive.

### Introduction

Unfortunately there is a growing incidence of incorrect posture. There are also people for whom body posture is just an aesthetic attribute its primary cause being the lack of information. It is shown that incorrect postural attitudes that

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persist over the years can create a high degree of discomfort, pain, disability that can often also lead to pathological forms hardly recoverable only by means of chiropractic.

In the dictionary, posture is defined as: Posts (<fr. Positions) – Stabilisation of various skeletal components, one from another, in a certain bodily attitude, conducive to the development of an action. There are two large postural systems: anti-gravity position that ensures the body maintenance or restore the balance in a fundamental orientation in relation to weight (physical vertical). It allows bipedal position and is a basic reference for space orientation and reperajul vertical, directional position that modifies anti-gravity postural architectures, organized themselves in relation to environmental stimuli (Larousse, 2006). Body posture is influenced by three factors: heredity, medical conditions and habit. The general appearance of the body (or, rather, its physical configuration) is - Sbenghe T. (1987) - the result of three factors: a) body attitude, which is determined by the ratio of the parties comprising musculoskeletal, being objective Eva main take, b) the increase of the body as a result of accumulation of quantities, in terms of height, weight and size, depending on age and sex, c) global development with age. The application of this therapeutic procedure should consider the following recommendations: the application of the posture should be based on consent and full cooperation of the patient; he must be informed that this posture is not always comfortable, but must be accepted for their benefits; correct posture is sometimes and analgesic role, in which case the patient must understand and cooperate for serial application of this therapeutic procedure, the duration of the mantaining of the posture is variable, depending on the nature, severity and stage of the disease. Posture (free, free-aided or fixed) addresses only to the soft tissues.

Posture is a function of the body based on the synergistic and coordinated locomotor elements and the central and peripheral nervous system by which we maintain: body stability, balance and constant relationship between body segments and between body and the environment (Cordun, 1999).

The human feature is an orthostatic, anti-gravity position, its maintenance through neuromioartokinetic interventions leads to a correct posture or attitude called normal orthostatic position alignment.

Human beings can adopt different positions: standing, sitting, lying and their derivatives. Wrong posture's prevention and primary prevention is achieved by maintaining a correct attitude of the body by self-control, both in daily, school and professional activities.

### ***Classification of posture deficiencies***

Posture deficiencies are classified according to the following criteria:

a) Depending on the severity, functional and structural forms are described.

Functional deficiencies - also called deviations, represent positions or attitudes of impaired support and movement of the body.

Functional deficiencies have the following characteristics:

- Do not show anatomical structural changes behavior;
- Are flexible, reducible, therefore correct or hypercorrect from taking positions or performance test movements called functional tests;
- Most often these can only be corrected by kinetic means.

Structural deficiencies - also called true pathological or deformations have the following characteristics:

- Structural changes occur in anatomical parts;
- Are fixed, irreducible, do not correct in certain positions or performance test movements called functional tests;
- Most of the times, can be corrected by complex orthopedic-surgical treatment medical, physical therapy being a complementary approach.

b) Depending on the scope they are global (total) and partial (segmental, regional or local) affecting the entire body or certain segments, regions or areas of the body.

**The prophylactic treatment** consists of preventing physical deficiencies, their aggravation or sequelae installation.

Wrong posture's prevention and primary prevention is achieved by maintaining a correct attitude of the body by self-control body by self-control, both in daily, school and professional activities.

Secondary prevention is established when the primary stage was exceeded, so physical deficiencies appeared. By applying early treatment one can prevent the aggravation of their complications.

Tertiary prevention aims to prevent installation of sequels, somatosensory lesions that could cause irreversible functional motor and/or mentally disability.

Maintaining a correct posture and body alignment is critical.

### ***Correct posture and body alignment***

Sbenghe (1987) considers that this objective is based on the following facts: a) many postural defects in childhood and adolescence to adulthood strengthens become starting points for further degradation of the musculoskeletal system, b) many musculoskeletal disorders, as of other devices, determine wrong postures and misalignments of the body, which, if it takes longer, remain functional or even organic, c) the recovery of functional impairment can not be conceived only in restoring the body's physiological relations because the kinematic chains of the body are based primarily on normal relations between the segments. Wrong posture and uscular imbalances and misalignment always attract the joint structures, lower yield and early appearance of fatigue.

Muscle imbalance is installed on several mechanisms: a) substitution, a functional replacement, b) "disposal", a "functional weakness", c) the compensation (particularly substitution), d) through incoordination, an impaired motor control in the normal motion or kinetic chain. Correct posture and body alignment uses the techniques: 1) the correct posture or hypercorrection, maintained by various



fastenings, 2) passive motion, active assisted and active, 3) isometric contractions, 4) various proprioceptive facilitation techniques. Prophylaxis of the wrong posture starts in school, continuing after adolescence. The typical period for installing and setting a bad posture is that of the body's growth and development. There are times when even at an adult age these wrong postures can occur as the result of professional activities held in poor conditions. To this can be added the gradually decrease of muscle strength due to lack of exercise. Main wrong postures and misalignments are found in the cervical spine, shoulders, back and lumbar spine and pelvis, the deficit alignment of legs being on second place (Albu Albu, Petcu, 2001).

Correction of the wrong postures is complex and depends on the scope (global or segmental), form (attitudinal or structural), its severity, age, sex, temperament, level of training, etc. associated diseases.

Deviations of the spine or spinal axis are diseases caused by various epathogenic factors.

The lateral deviation can be of any type, due to a vicious posture required by certain occupational conditions. This temporal lateral deviation, prolonged, is notspinal scoliosis, but an abnormal attitude proper for its establishment.

When a child voluntarily spends much time indoors gets a wrong posture, this cannot be called scoliosis, but temporal deviation. In this condition there is no deformation of the chest or spine load.

### ***Personal experience***

Kinetic programs that we used consisted of corrective exercises, analytical exercises and general physical conditioning that provides the formation of an accurate sense of attire (especially a sense of the correct position of the pelvis), tone and strength corresponding to the muscle groups needed to maintain a correct posture and a balanced position of the pelvis, giving the body all the necessary vigor and eliminating all feeling of weakness.

In what is called the mobilization of the spine this worked the muscle that preceded it, so that it can make a skeleton be corrected or flexible as much as possible.

From the wide range of possibilities offered by the movement as remedy of deficiencies in posture we synthesized different working techniques, individualizing programs based on their effectiveness in kinetics, without excluding, however, simultaneous use of their therapeutic methods.

Kinetic programs used were individualized in terms of the systematical resources used and of the method of implementation of specific motor acts.

We present some exercises in sports games used in medical gymnastics lessons to students of the University of Bucharest, for a correct alignment of the body:

#### *a) Means of basketball*

- Individually with a ball: arms are outstretched to the side - send the ball from one hand to the other over the head, never losing sight of the ball;
- In pairs with a ball: transmission of the ball with your back to the partner's, arms outstretched, the ball moving from right to left and vice versa;

- With your back to the partners's in pairs, 2-3 m distance, throwing the ball over the head with two hands to the partner who catches, passes it and after turnins back; In a row, at an arm's length apart, movement of the ball with two hands above the head; The same exercise but the ball is moved by side with twisting of the trunk to the right or left;
- From sitting behind the basket with a ball, throwing the ball with two hands above the head with trunk extension;
- Walk on the tip of the toes with two hands held up;
- Walk accustoml basketball held to the back of the neck and raising at every two steps a bent knee;
- Walk with two balls held to each side of the hip, four steps on the tip of the toes, four steps on the heels;
- Walk on the trunk tilted slightly forward on the tip of the toess - hands supporting the basketball on the head.

*b) Means of volleyball*

- Staying away, arms diagonally up supporting the volleyball before lifting the knee in the chest;
- Sitting with the volleyball ball on head, which is supported from the side with both hands, having the knee bending and extent;
- Sitting, with a ball, control passing runs;
- In pairs, sitting passes runs up to partner;
- Sitting with a ball control passing runs;
- Individual passes control runs away on peaks;
- Same with walking heels;
- In pairs, near the wall, one is located facing the wall, and the other behind. One who is throwing the ball against the wall to his colleague, who runs a pass over the head to the wall;
- Three with a ball, place in line, the middle running the ball pass over his head offered to partner and catches it at the back and forward first;
- Same, but the middle one 180° turns and runs after birds pass over the heads of ball thrown from both performers;
- The same exercise, but with the difference that the middle will be back near the net, running pass over his head to peer over the net;
- Three with a ball, contractors are willing delta areas 3, 4, 5. Most of the Z3 Z5 throws the ball and running it with both hands graze 10-15 up at Z4.

Individual, make a throw, followed by attack hit over the net;

- Perform attack hit the ball thrown by the teacher;
- Perform 6-8 attack hits, the ball thrown, consecutive;
- In pairs, runs up service from a distance of 5-6 m;

- Same, but at 9 m distance;
- Perform consecutive service out of bounds.

### **Conclusions**

Kinetic treatment can give surprising results if applied methodically and persistently, administered and dosed with skill, but can be harmful when mistakes occur at the level of indications, extent and application.

Kinetic programs used were varied and diverse, being organized and conducted in accordance with the needs of the individual and were directed toward: 1) development, 2) prevention, 3) to compensate, 4) to correct.

Evaluation results should be made at regular intervals, following the physical therapist performance against the objectives set.

### **Suggestions**

The organization of prevention and correction of deficiencies in posture should be on the priority list of a responsible person.

Position detecting deficiencies in school-age children is a problem that requires systematic activity both in the physical education teachers, doctors and even parents.

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## IMPROVING THE REACTION TIME OF SECONDARY SCHOOL PUPILS (GRADES V-VI) THROUGH CREATIVE EXERCISES SPECIFIC FOR SCHOOL BASKETBALL

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**ABSTRACT.** The paper shows a pragmatic strategy in order to optimize the means for improving the reaction time of secondary school pupils (grades V-VI). In order to improve this psychomotor skill within the field of basketball in secondary school we used certain exercises and practiced them with the pupils, exercises which demanded fast reactions upon different signals (sound, tactile, visual), starting from different initial positions. During the first phase specific exercises as responses to different signals were conceived under our guidance with the entire class, which were then practiced. During a second phase, after having understood the task, the children divided into teams needed to conceive similar exercises. The most significant were then practiced with the entire class, using up front practicing (with even and individual pace), in pairs or groups. As a result of processing the information gathered during the final tests, it can be observed that the values of the trial group are better than the ones of the control group. This fact proves the efficiency of the independent variable (strategy and applied exercises) and its influence on the dependent variable meaning the results obtained and the improvements pointed out. The paper describes some of the exercises used and applied to the trial group.

**Keywords:** skill, psychomotor skill, reaction time, sound signal, visual signal, initial position, technical procedure.

**REZUMAT. Dezvoltarea vitezei de reacție la elevii de gimnaziu (clasele V-VI), prin exerciții creative specifice baschetului școlar.** Lucrarea prezintă o strategie pragmatică în vederea optimizării mijloacelor pentru dezvoltarea vitezei de reacție la elevii din ciclul gimnazial (clasele V-VI). Pentru dezvoltarea acestei aptitudini psihomotrice, în cadrul disciplinei baschet la ciclul gimnazial, am folosit și am exersat cu elevii exerciții care au necesitat reacții rapide la diferite semnale (sonor, tactil, vizual), pornind din diferite poziții inițiale. În prima fază, cu toată clasa, sub îndrumarea noastră au fost concepute și s-au exersat exerciții specifice cu răspunsuri la diferite semnale urmand ca, în faza a doua, după înțelegerea sarcinii, elevii împărțiți în formații de lucru diferite să conceapă exerciții analoage. Cele mai

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semnificative au fost exersate cu toată clasa folosind exersare frontală ( în tempo uniform sau individual), pe perechi sau pe grupe. În urma prelucrării datelor obținute la testările finale se poate observa că valorile obținute de lotul experimental sunt superioare lotului martor. Acest fapt demonstrează eficacitatea variabilei independente (strategia și exercițiile aplicate) și influența acesteia asupra variabilei dependente reprezentată de rezultatele obținute și de progresele evidențiate. Lucrarea descrie câteva din exercițiile aplicate lotului experimental.

**Cuvinte cheie:** aptitudine, aptitudine psiho-motrică, viteza de reacție, semnal sonor, semnal vizual, poziție inițială, procedeu tehnic.

### General Remarks

Reaction time is a manifestation form of speed, depending on the five components (appearance of the impulse with the receptor; transmission with the corresponding means; analysis of the impulse – which takes the most time; transmission with the corresponding means; stimulation of muscles). *„Reactions are either simple or complex. Simple reactions are when the response comes as an answer to a movement already known and which occurs spontaneously. Complex reactions mainly show in bilateral games, but also in sports, where the answer needs to take into account the actions of a „partener” or „opponent”* ( cf. Cârstea,G., 1996).

Some research done by Thorner (cf. Cârstea, Gh., 1997) lace the latent time somewhere between 140 and 180 miliseconds (140 ms with tactile stimuli, 150 ms with sound signals, 180 ms with visual signals).

Reaction time has different manifestation indicants for each body segment. The best indicants are generally registered with the upper limbs, according to conducted research.

Reaction timp decreases (improves) under the influence of specific exercises within age 8 and 25, then it comes to a stillstand until around an age of 60 years, when it starts to decrease. As it is a psychomotor skill with a great degree of heritability (heredity approximately 90%), it can be improved, but within narrow boundaries.

Reaction time has its peak around the age of 20.

In order to improve the reaction time in basketball in secondary school we used and practiced with the pupils certain exercises which called for fast reactions at different signals (sound, tactile, visual), starting from different initial positions.

### Hypothesis

We consider that by applying a set of creative exercises specific for the game of basketball, conceived by the teacher together with the pupils the reaction time improves significantly.

### Aim of the paper

Showing an optimal number of specific exercises for the improvement of the reaction time in pupils of grades V and VI, according to the existing didactic premisses and infrastructure, in order to improve the instruction process in secondary school basketball.

### Location and materials

The trial took place at „Nicolae Titulescu” school from Cluj-Napoca. The school is well equipped for meeting the demands of the school curriculum for basketball.

### Subjects of the trial

Pupils from grades V and VI of „Nicolae Titulescu” school Cluj-Napoca were subjects in the trial.

106 pupils took part in the trial, 52 girls and 54 boys, equally divided into trail groups and control groups.

**Table no. 1.** Number of sample of the form

Grade	Boys		Girls		Sum
	Trial	Control	Trial	Control	
a V-a	14	14	14	14	56
a VI-a	13	13	12	12	50
<b>Total</b>	<b>27</b>	<b>27</b>	<b>26</b>	<b>26</b>	<b>106</b>

The trial groups were made up of pupils from grades V A and VI B, and the control groups of pupils from groups V B and VI A.

### Organisation, phases and development of the trial

The trial took place under normal conditions during the physical education classes with focus on (learning topics) basketball, according to the structure of the school year, divided into semesters and focusing on the suggested work hypothesis.

The trial took place from October 2011 to February 2012.

The trial consisted of **4 phases**:

Phase no. 1 – *pre-trial*: October, 10<sup>th</sup> – 14<sup>th</sup> 2011.

Phase no. 2 – *trial* (per se): October, 16<sup>th</sup> – November, 14<sup>th</sup> 2011.

Phase no. 3 – *post-trial*: November, 18<sup>th</sup> – November, 22<sup>nd</sup>

Phase no. 4 – *retesting* (February, 10<sup>th</sup> – December, 20<sup>th</sup>)

## Investigation Methods

The reaction time is tested using the gymnastics stick with the test of the „falling stick”. The stick was graded every centimeter, starting with 0, 1, 2, 3, ..., n up to the other end. The pupil from a standing position, feet slightly apart and with the right (left) arm in front, slightly bended from the elbow holds the palm open oriented towards the stick and with the side where the 0 grading is. The tester releases the stick by surprise and the pupil needs to catch it as fast as possible. The distance from point 0 to the point where the stick is grabbed by the pupil is measured. The test is conducted three times and the average is recorded.

In order to improve the reaction time within the field of basketball in secondary school we used certain exercises and trained them with the pupils, exercises which demanded fast reactions upon different signals (sound, tactile, visual), starting from different initial positions.

In parts 2 - 3 of the lesson and in the fundamental parts 4 and 5, during each lesson the improvement of the reaction time was especially trained for 10 - 12 minutes (during the experimental phase). During the first phase specific exercises as responses to different signals were conceived under our guidance with the entire class, which were then practiced. During a second phase, after having understood the task, the children divided into teams needed to conceive similar exercises. The most significant were then practiced with the entire class, using up front practicing (with even and individual pace), in pairs or groups.

In the following we present the conceived exercises, which were applied on the trial group.

**Table no. 2.** The conceived exercises applied on the trial group

1	Standing, ball in front of the body	Reverse comand: „All players run” - they will jump „All players jump” - they will dribble „All players dribble” - they will run	6 X	Spread out on the entire basketball court	Up front practice
2	Standing	Pupils run, the teacher suddenly shouts out a number and the pupils form a group of 3, 4, 5 (according to the number shouted out).	2 X	Spread out on the entire basketball field	Up front practice
3	Ventral decubitus	Upon a signal the pupils stand up and run, upon a second signal they lie down again face down, and so on (other starting positions can be introduced)	2 X	In columns of 4	Up front practice in rows
4	Standing, ball in front of the body	Special rebounder panel and catching the ball without it falling down	5 min	5 pupils per panel	Individual training
5	Standing, ball in front of the body	Passes at the wall bars and catching the ball without it falling down	5 min	3 pupils per wall bar	Individual training
6	Standing, ball in front of the body	Passes at the backboard, or at the wall with the rugby ball and catching the ball without it falling down	4 min	On 4 columns	Individual training

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7	Standing, ball in front of the body	Standing dribbling, upon hearing the whistle clap hands twice and continue dribbling.	6 X	In a line on 4 rows	Up front practice
8	Standing pairwise, face to face, with a ball	One of the partners holds the ball in their hands, with arms stretched out in front (the other pupil holds the arms wider, prepared at about 5cm under the ball. The pupil with the ball releases the ball suddenly and the partner needs to catch it before it reaches the ground (they change tasks)	4 X	Pairwise, with a ball	Up front practice, pairwise
9	Standing face to back, each with a ball	The one standing with the back at their partner dribbles standing, the other one holds the ball up in front. Upon signal "1" from the one at the back, the one in front dribbles twice and moves the ball fast from one hand to the other in front, upon signal "2" they jump 180° and catch the ball which is released by the team member (they change tasks)	4 X	Pairwise, each with a ball	Up front practice, pairwise
10	Standing face to back, pairwise	The one standing face forward holds a gymnastics stick vertically from one end, with the arm lifted up forward. Upon signal ("go") the stick is dropped and the one with the back (who dribbles standing) turns around to try to catch the stick, before it hits the ground (they change tasks).	4 X	Pairwise, with a ball	Up front practice, pairwise
11	Standing face to face, pairwise	One of the pupils dribbles standing, while holding the other hand around and 5 cm from the upper end of the stick (they do not touch the stick), which is held by the other team member vertically. Suddenly the stick is dropped and the pupil dribbling standing needs to catch it by closing the palm (the dribbling does not stop).	6 X	Pairwise, with a ball	Up front practice, pairwise
12	Standing face to back with a ball	The one standing face forward shouts a number: "1" or "2" and will then pass the ball. According to the number shouted the team member will jump vertically with right, or left turning respectively at 180°, gets the ball, passes it back and returns to the initial position (they change tasks).	6 X	Pairwise, with a ball	Up front practice, pairwise
13	Standing, face to face with a ball, bended knees	One of the pupils passes randomly, the other team member will react correspondingly, i.e. if the pass is directly to the chest, catching the ball will be preceded by one clap of the hands; if they bounce pass the catching is preceded by two claps of the hands.	6 X	Pairwise, with the ball	Up front practice, pairwise
14	Face to face, pairwise, each with a ball	The pupils dribble standing pairwise, while a pole is placed in between them. Upon hearing the whistle they will touch the pole fast with the hand that is not dribbling.	6 X	Pairwise, each with ball	Up front practice, pairwise



15	Face to face, pairwise, each with a ball	Dribbling standing with the right hand, upon hearing the whistle slap palms with the left hand (the pair reacting fastest wins). They change the hand for dribbling.	6 X	Pairwise, each with a ball	Up front practice, pairwise
16	Face to face, pairwise, each with a ball	Dribbling standing with the right hand, upon hearing the whistle moving the ball with dribble to the left hand and slap palms (with the right hand).	6 X	Pairwise, each with a ball	Up front practice, pairwise
17	Face to face, pairwise, each with a ball	Standing high speed passes, upon hearing the whistle the type of pass is changed.	2 min	Pairwise, with a ball	Up front practice, pairwise
18	Face to face, pairwise, each with a ball	Standing passes with 2 balls (one pupil does the bounce pass the other one the chest pass), upon hearing the whistle the pupils change the pass type (the one having bounce passed chest passes and vice-versa)	10 X	Pairwise, face to face with 2 balls	Up front practice, pairwise
19	Face to face, pairwise, each with a ball	Standing passes with 2 balls (one pupil does the bounce pass, the other one the chest pass), upon hearing the whistle they change the pass type (the one having done the chest pass, bounce passes and vice versa), upon hearing two whistles the initial pass types are trained.	4 X	Pairwise, face to face with 2 balls	Up front practice, pairwise
20	Pairwise, each with a ball	Game: „Stopping the dribbling”	2 min	Pairwise, each with a ball	Up front practice, pairwise

## Results and discussions

**Table no. 3.** Statistic indicators regarding the test “FALLING STICK” (trail group, boys)

Gr.	TRAIL GROUP								
	AVERAGE			S.D			V.C.		
	T1	T2	Ret.	T1	T2	Ret.	T1	T2	Ret.
V	22,07	19,07	18,9	4,026	3,863	3,9	18,24	20,25	20
VI	19,61	14,76	14,4	2,466	2,153	2,16	12,57	14,58	14,11

**Table no. 4.** Statistic indicators regarding the test “FALLING STICK” (control group, boys)

CONTROL GROUP								
AVERAGE			S.D.			V.C.		
T1	T2	Ret.	T1	T2	Ret.	T1	T2	Ret.
21,64	20,42	20,64	2,348	2,194	1,79	10,85	10,75	8,68
19,53	16,53	17,46	2,340	1,646	2,09	11,98	9,57	12,01

**Table no. 5.** Statistic indicators regarding the test “FALLING STICK”  
(trail group, girls)

CI	TRAIL GROUP								
	AVERAGE			S.D.			C.V.		
	T1	T2	Ret.	T1	T2	Ret.	T1	T2	Ret.
V	21,57	18,42	18,9	2,691	1,953	2,06	12,47	10,6	10,6
VI	20,41	15,41	15,75	3,04	1,552	1,36	14,89	10,07	8,66

**Table no. 6.** Statistic indicators regarding the test “FALLING STICK”  
(control group, girls)

CONTROL GROUP								
AVERAGE			S.D.			C.V.		
T1	T2	Ret.	T1	T2	Ret.	T1	T2	Ret.
21,64	22,35	21,21	2,255	1,505	1,61	10,42	6,73	7,59
20	18,66	18,91	3,162	2,321	2,75	15,81	12,43	14,55

**Table no. 7.** Significance of the difference  
between the average in trail groups

Grade	Test “t” student
Grade V boys	2,1
Grade V girls	3,2
Grade VI boys	2,4
Grade VI girls	4,4

With the boys’ groups improvements are obvious at all grades, comparing T1 and T2 with significantly higher values as compared to the control group (image 1- 4).

The variability coefficient (V.C.) shows medium homogeneity in almost all grades in the trial, except grade V, trial group, where low homogeneity is recorded (20,25%).

With the retesting, except grade VI, which records a small improvement, the other grades record setbacks (image 1).

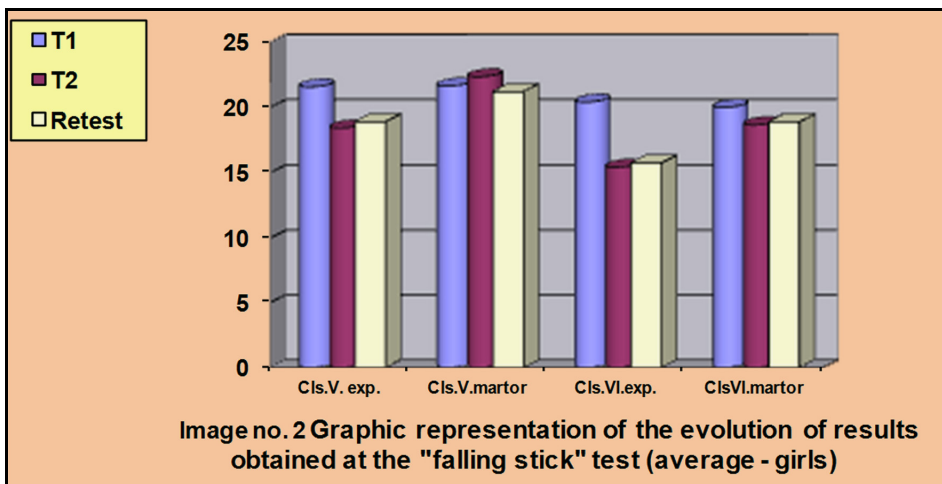
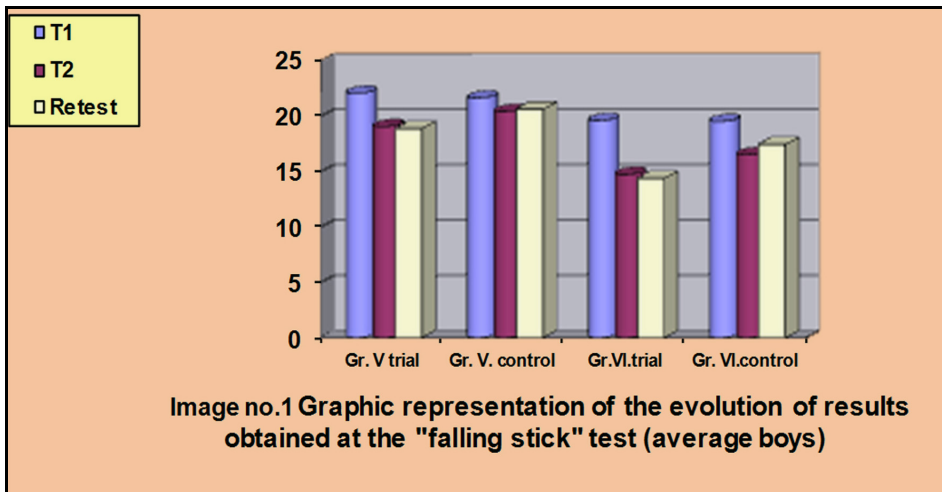
Girls record obvious improvements from T1 to T2 for the entire group taking part in the trial. Trial groups record better performance at the final test (image 2).

The variability coefficient shows medium homogeneity in all grades, except grade V, control group, where homogeneity is high (6,73%).

With the retesting the girls, except grade V trial group, who record a lower performance, all other grades record a slight improvement.

The best improvement from T1 to T2 after applying the independent variable is recorded in trial groups of grades VI boys and girls.

Between the initial average of the group during the pre-trial phase and the final average from the post-trial group, as a result of calculating the significance index t student, significant differences are recorded, with a probability of 0,05%, except grade V boys, who present non-significant values. The strongest value is recorded in grade VI girls, also due to the fact that they recorded low values at the initial test.



## Conclusions

1. The conceived and conducted exercises are efficient and contribute to the improvement of the reaction time.

2. We consider that the statistical indicators applied (means, standard deviation, variability coefficient, significance of the difference) allowed us to record valid and significant results, which the interpretation of the results of this research are based on.

3. After processing the data, at the final tests it can be observed that the values of the trial group are better than the ones of the control group. This proves the efficiency of the independent variable (strategy and applied exercises) and its influence on the dependant variable represented by the results obtained and the progress pointed out.

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## UNIVERSITY PHYSICAL EDUCATION – MEANS OF DEVELOPMENT FOR PROFESSIONAL ABILITIES

CECILIA LILIANA IONESCU<sup>1</sup>

**ABSTRACT.** The academic research projects, which have been concluded in the last period, have certified the fact that analyzing the effects from the athletics field, have focused not only on processes that concern just the motion dimension from the perspective of the field mentioned above, but on the ordinate of different dimensions, such as the social, the individual, the moral, of attitude, the coherent etc. of the participants in athletics activities. In the actual framework of education from the university teaching, athletics features a final element in defining and building as detailed of the professional skills scene of the future graduates, from the view of personality forming, attitude sets, of value and behavior linked point blank and objectively to the contemporary society's requests in which we develop the daily activities. In accordance with the sustained ones, we have performed a study that included two sampler populations, 219 students and 80 academics from 8 universities, study which aimed at finding the respondents' opinion towards the moral and physical requests of the future trades/employments, consequence of practicing athletics activities. In other terms, the study highlighted if there is an influence on the students' perceptions towards the awareness or not to the values that can be valued by these in distinct social environments, professional, homelike through participating in activities appropriate to athletics' field.

**Keywords:** athletics, professional abilities, values

**REZUMAT. Educația fizică universitară – mijloc de formare a Competențelor profesionale.** Proiectele de cercetare academică, ce au fost finalizate în ultima perioadă, au certificat faptul că analizarea fenomenelor din domeniul educație fizică, s-au focusat nu doar pe procese ce privesc doar dimensiunea motrică din perspectiva domeniului mai sus amintit, ci pe ordonata diferitelor dimensiuni, precum cele sociale, individuale, profesionale, morale, atitudinale, axiologice etc. ale participanților la activități de educație fizică și sportive. În contextul actual al educației din învățământul superior, educația fizică reprezintă un element hotărâtor în definirea și constituirea cât mai completă a tabloului competențelor profesionale ale viitorilor absolvenți, din perspectiva formării personalității, seturilor atitudinale, valorice și de conduită corelate în mod direct și obiectiv cerințelor societății contemporane în care ne desfășurăm activitățile

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cotidiene. În concordanță cu cele afirmate, am întreprins un studiu ce a inclus două populații de eșantionare, 219 studenți și 80 cadre didactice, de la opt instituții de învățământ superior, studiu care a vizat aflarea opiniilor respondenților referitoare la cerințele fizice și morale ale viitoarelor profesii/ocupații, efect al practicării activităților de educație fizică. Cu alte cuvinte, studiul a evidențiat dacă există influențe asupra percepțiilor studenților referitoare la conștientizarea sau nu a valorilor ce pot fi valorificate de către aceștia în diverse medii social, profesional, familial prin participare la activități specifice domeniului educație fizică.

**Cuvinte cheie:** educație fizică universitară, competențe profesionale, valori

The professional ability is reckon by the ideologists as the "ability to apply, transfer and combine knowledge and skills in distinct work situations and environments, to accomplish activities asked at your job, at the qualitative level, mentioned in standard" (1). The set of professional abilities has to represent the balanced usage and joining of the knowledge, the skills, the attitudes and the values acquired for getting some suitable results professionally, in order to obtain a professional quality. In this context, formal and non formal education hold important parts in obtaining a professional skill. On the level with the institutions of higher education, through formal education the professional future assures itself the comprehensive development, by continuous assimilation of knowledge from as many fields as possible, performing in a formal environment with definite and accurate rules. Through nonofficial education is completed the official education; the nonofficial education reflects the educational influence that display out of classes and take place deliberate and methodical for the reach of a higher level of distinctive knowledge and other teaching lines.

The purpose that we had to fulfill for this variable consisted in finding the students' opinion as regards to the appropriate moral and physical requests of the future trades/employments. The item through which we have analyzed this variable from the questionnaire of opinion and values addressed to the students and the item from the questionnaire forthcoming to the educational staff had the same statement namely: 1.3/1.5 how the following values formed also through activities from the athletics area and sport, higher education of no profile, appreciate that it should define the future graduate of...?

Furthermore, we have had in mind and we have succeeded to know what is the intensity of the connections between the opinions of the two sample populations concerning the listed values, by calculating the correlation coefficients.

In the charts 1 and 2 are registered the students' options and of the academics towards to the acknowledgment of values which is assimilated and promoted through practicing athletics and sporting activities, values that should be in a value scale of any graduate of a higher institute. We mention that we

display this item in a questionnaire of opinions and values alike, equally taking interest in which are the students' choices of answer and as well of the academics. We set ourselves to do a parallel analysis of the answers of the two sampler populations, measure that facilitates for us to see if there is or not a common agreement of the stated opinions.

**Table 1.** The values distribution formed by athletics and sporting activities to the future graduate, in the students opinion.

ID	VALUES	SCALE					PLACE		
		5	4	3	2	1	5+4	3	2+1
a	Self confidence	47	85	68	12	7		III	
b	Fair play	34	84	64	22	15		V	III
c	Sympathies towards the group facing real difficulties not supposed	55	75	66	12	11		IV	
d	Commitment and loyalty towards the institution from which you are a part of	59	70	54	23	13			IV
e	Competence of adequate employment	37	83	52	28	19			II
f	Courage and making decisions which implies taking chances	80	90	25	21	3	I		
g	The ability to have initiative	74	80	40	20	5	II		
h	The ability to adapt, the flexibility at solving some new coming situations	38	87	66	24	4		IV	
i	The inventive -creative ability	52	68	74	14	11		I	
j	Self control of the emotional states	78	42	70	28	1		II	
k	High coefficients of the initial motion qualities (speed, endurance, skill, strenght) required for fulfilling the profession effectively	69	78	47	20	5	V		
l	Positive influences on personality	46	37	63	48	25			I
m	Responsibility	93	59	40	19	8	III		
n	Affirmative behavior	59	80	46	26	8			V
o	Impulse for competition	84	67	51	12	5	IV		
p	Generosity	57	84	48	19	11			
<b>TOTAL OF OPTIONS</b>		962	1169	874	348	151			
	PERCENTAGE	27%	33%	25%	10%	5%			

From number one chart interpretations are distinguished the following acknowledgments:

a) due to the maximum interval 5 the first five positions are occupied decreasing of values like “responsibility” with 93 subscriptions, “impulse for competition” with 84 options, “courage and making decisions that imply taking chances” with 80 options “self control of the emotional states” with 78 votes and “higher coefficients of the initial motion qualities required for fulfilling the profession effectively” with 69 nominations from the respondents.



b) concerning the options' percentage stated by the respondents, we underline the descending trend acquired on scale sizes, starting from the fourth step and reaching to the first step, without register variations of the collected answers, from a level to the next. For the upper step have been acquired 27% out of the answers' total for the listed values, for the fourth level 33%, for the middle level 25%, and for the lower levels 10, respectively 5%.

c) significant for us is placing the indicator stated through "higher coefficients of the initial motion qualities (speed, endurance, skill, strenght) required for fulfilling the profesion effectively" that has been scaled maximum interval, on the fifth position, from a total of 16 values displayed for this item.

We express, therefore, the satisfaction concerning the students' choice for this feature of the physical size, required for getting and keeping a better physical shape which has to be compatible, necessary, useful and adequate to professional action of the future graduates.

We consider interesting the approach of the values list and the places' establishment occupied after the total of the intervals 5+4 and 2+1. Therefore, we obtain the following positions of the values for 5+4: first place is assigned for „courage and making decisions which imply taking chances" with 170 choices, second place for „initiave ability", with 154 options, and „responsibility" with 152 votes is taken by third place.

We observe, with satisfaction, that the percent acquired through results' addition on the upper intervals represents 60% of the total of the stated options. For the intervals 2+1 we discover that „positive influence on personality" takes first palce with 73 adhesion; „competence of adequate employment" second place with 47 choices and third place „fair play" with 37. The lower scores acquired by this values give us the chance to point up that these are quite well divided on upper intervals.

For a more thorough analysis of this item, we introduce in chart number 2 the answers' summarization of the academics, wanting to know their opinion, respecting the field's distinctiveness from which they are a part of and the experience of some of them as former performers to distinct sporting areas.

Analyzing the acquired data from the number 2 chart, after questioning the academics on the same subject, we underline the placing of approximate three of the values charted on the maximum interval namely "competence of adequate employment" "wherefore have been acquired 48 from the total of the 542 options stated for this interval, "the ability to have initiative" with 46 options, "the ability of communicating in situations of risk or difficulty" with 45 options.

Furthermore, are noticed the places pointed to the values upon the intervals total 5 and 4, the interval 3 and the intervals 2 and 1. Therefore, on the maximum first place was given for "the ability of communicating in situations of risk or difficulty", second place for "self control of the emotional states", third place for „the ability to have initiative".

**Table 2.** Academics' options towards the future graduate's features, consequence of the students' participation appropriate to field

Id	VALUES	SCALE					PLACE		
		5	4	3	2	1	5+4	3	2+1
a	Self confidence	24	40	16	0	0	IV		
b	Fair play	30	24	20	6	0		II	
c	Sympathies towards the group facing real difficulties not supposed	34	28	12	6	0			
d	Commitment and loyalty towards the institution from which you are a part of	20	30	14	10	6			I
e	Competence of adequate employment	48	16	6	10	0	IV		
f	Courage and making decisions which implies taking chances	40	14	16	10	0			
g	The ability to have initiative	46	20	4	10	0	III		
h	The ability to adapt, the flexibility at solving some new coming situations	28	16	18	12	6		III	
i	The inventive -creative ability	35	28	2	15	0	V		II
j	Self control of the emotional states	38	30	12	0	0	II		
k	High coefficients of the initial motion qualities (speed, endurance, skill, strenght) required for fulfilling the profession effectively	30	25	25	0	0		I	
l	Positive influences on personality	40	12	12	10	6			I
m	Responsibility	28	24	16	12	0			
n	The ability of communicating in situations of risk or difficulty	45	25	10	0	0	I		
o	Impulse for competition	30	27	13	10	0			
p	Generosity	26	25	15	14	0			III
r	Others ( specifications)	0	0	0	0	0			
<b>TOTAL OF OPTIONS</b>		542	384	211	125	18			
PERCENTAGE		42%	30%	16%	10%	2%			

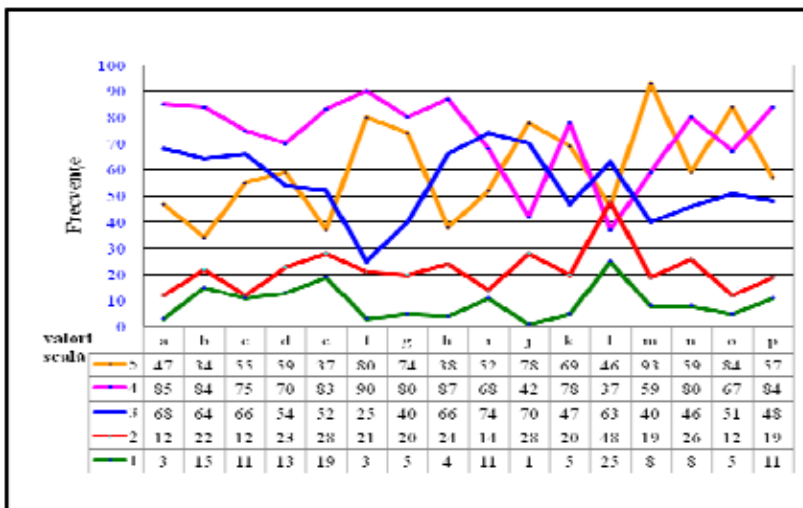
We notice that on the medium interval „higher coefficients of the initial motion qualities (speed, endurance, skill, strenght) required for fulfilling the profession effectively” have acquired first place. This last value conjunctly with other four values have been scaled by the respondents starting from level 3 unto the maximum.

It is stated that the high percentage acquired by the sample studied upon the scaling at upper levels 5 and 4 is of 72%, unlike the options' percentage stated by the same sample for the values scaled on the lower intervals that is 12%.

It is interesting to underline the distribution of the values on the intervals 5, 4 and 3 in the opinion of the two samples. Therefore, the students have allocated the listed values the following percents: 27%, 33% and 25%, being acquired a total percent upon the three intervals of 85%, while the academics have displayed 42%, 30%, 16%, having as a result a percent of 88%, upon the upper and medium levels.

It is noticed, with positive grades, the quite small difference between the scaling made between the two sampler populations upon the three intervals phrased above.

What do we want to highlight? We consider that the importance of these displayed values is not known and appreciated just by the academics from the athletics field, but also by the students, through the quite proximate percentages, of which stated options for the respective values have ranged on the upper positions 5, 4 and 3, succeeding in surprising us pleasantly. In number one image we display the graphical distribution of the stated options by the students towards the values that should characterize the future graduates of higher education.



**Figure 1.** The featured values of the future graduate - the students' opinion

From the graphical diagram, we appreciate that it is interesting to analyse, for each value, where the maximum the minimum of the frequency is achieved. We notice with satisfaction that all the values from the displayed list have acquired the minium value upon the first lower interval. From the total of the 16 values designated, the imaged ones by a, b, c, d, e, f, g, h, k, n and p reach the maximum of options stated upon the interval 4, j, m, and o reach a maximum upon the interval 5 and i and l, have got a maximum upon the interval 3. On the lower levels 2 and 1 the student's options for the scaled values have been of 449, respectively 15% from the total of 3504 stated.

As a first conclusion, we can state that the students have found the majority of the values significant, and the big frequencies acquired upon the upper interval 4 for 11 values from the displayed ones, have only strengthened their opinion toward the knowledge and the acknowledgment for these values.

As we stated at the beginning of this article, we were interested in which is the connections' profundity between the opinions stated by the questioned populations and how they link. We introduce in chart number 3 the links' matrix between the opinions displayed by the two samples, towards the value image that should feature the future graduate.

**Table 3.** The matrix of the links towards the graduates' featured values

Valori	a- CD	b- CD	c- CD	d- CD	e- CD	f- CD	g- CD	h- CD	i- CD	j- CD	k- CD	l- CD	m- CD	n- CD	o- CD	p- CD
a-ST	0,91	0,80	0,69	0,86	0,25	0,38	0,30	0,52	0,40	0,69	0,86	0,20	0,72	0,54	0,71	0,72
b-ST	0,85	0,64	0,53	0,82	0,03	0,16	0,10	0,31	0,27	0,53	0,70	0,04	0,59	0,34	0,57	0,61
c-ST	0,91	0,88	0,76	0,84	0,37	0,51	0,41	0,64	0,44	0,77	0,93	0,35	0,78	0,65	0,76	0,75
d-ST	0,95	0,94	0,88	0,91	0,54	0,64	0,59	0,75	0,64	0,87	0,94	0,49	0,90	0,77	0,89	0,88
e-ST	0,90	0,64	0,60	0,90	0,10	0,17	0,19	0,30	0,41	0,58	0,66	0,01	0,63	0,39	0,64	0,67
f-ST	0,92	0,86	0,96	0,95	0,73	0,69	0,80	0,71	0,91	0,94	0,78	0,62	0,91	0,88	0,97	0,92
g-ST	0,95	0,94	0,97	0,95	0,72	0,73	0,77	0,79	0,84	0,96	0,89	0,63	0,95	0,88	0,98	0,94
h-ST	0,87	0,71	0,61	0,85	0,14	0,27	0,20	0,42	0,37	0,58	0,75	0,06	0,69	0,41	0,66	0,71
i-ST	0,82	0,84	0,66	0,73	0,30	0,49	0,31	0,63	0,31	0,68	0,92	0,30	0,72	0,56	0,67	0,68
j-ST	0,55	0,89	0,73	0,49	0,68	0,87	0,64	0,94	0,50	0,71	0,88	0,73	0,83	0,73	0,74	0,77
k-ST	0,96	0,96	0,95	0,94	0,66	0,71	0,71	0,78	0,77	0,93	0,92	0,58	0,95	0,85	0,96	0,93
l-ST	0,09	0,44	0,17	0,07	0,15	0,41	0,08	0,52	0,01	0,11	0,45	0,22	0,42	0,11	0,25	0,40
m-ST	0,75	0,95	0,97	0,73	0,92	0,94	0,93	0,95	0,85	0,97	0,88	0,89	0,94	0,99	0,95	0,88
n-ST	0,97	0,90	0,89	0,98	0,54	0,59	0,61	0,68	0,74	0,87	0,86	0,44	0,91	0,75	0,92	0,92
o-ST	0,86	0,99	0,96	0,81	0,78	0,85	0,80	0,91	0,75	0,97	0,97	0,76	0,94	0,93	0,94	0,89
p-ST	0,99	0,87	0,86	0,98	0,47	0,52	0,54	0,62	0,67	0,86	0,86	0,38	0,85	0,72	0,88	0,86

The number 3 chart points out the value of the link coefficients between the stated opinions by the respondents towards the sustained values as a consequence of the appropriate activities' practicing that should be distinctive to the future graduates. Therefore, we will effectuate the discussion upon the options stated by the students and academics for the same listed values, respectively value "a", from the students with the same value at the academics, corresponding as well for the other values "b", "c" etc. From the underline diagonal, we find out that from the 16 values displayed, 12 have got the link coefficient above 0,5 (apud. Popa, 2008) describing a high relation that frames in the intervals (0,5-0,7) very high (0,7-0,9) and almost perfect (0,9-1,0) between the items brought up.

A single value namely “the competence of adequate employment” is on the minimum step (0,0-0,1), pointing the fact that there are major distinctions of opinions between the stated answers “positive influences on personality” are in the interval 0,1-0,2, describing a minor relation; on the interval 0,3-0,5 it is ranged “the ability to adapt”, and “the inventive-creative ability”. From the values that have acquired high link coefficients we specify: self-confidence, commitment and loyalty towards the institution from which they are a part of, high coefficients of the initial motion qualities required for fulfilling the profession effectively, responsibility, impulse for competition etc.

At the final of the displayed article, based on the analysis performed on the monitored data in tables and graphics, we conclude that there are similarities towards the habits of mind of the questioned samples, from the point of view of the foundation’s set of values assimilated and promoted, consequence of practicing athletics and sporting activities, that the future graduates should hold. At the same time, we are convinced of the fact that students are aware, through the knowledge and acknowledgment of the listed values, at least at a theoretical level that by practicing athletics and sporting activities are being developed values that positively reflect upon the attitude, behavior, as well as upon professional abilities of the future graduates.

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## THE EFFECTS OF PHYSICAL THERAPY ON KNEE OSTEOARTHRITIS REHABILITATION

ANAMARIA KESE<sup>1</sup>, DENISA ENESCU-BIERU<sup>1</sup>,  
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**ABSTRACT. Objectives:** This study examines the rehabilitation of a 30 patients group diagnosed with primitive or secondary knee arthritis who received physical therapy. **Materials and methods.** The study was conducted on a group of 30 patients older than 40 years, diagnosed with primary or secondary knee arthritis, to their admission into the service of Physiotherapy and Rehabilitation Medicine, who were divided in two groups: a control group (n = 14) who received electrotherapy, massage and medical symptomatic pain relievers and the active group (n = 16), whose therapeutic program included electrotherapy, massage and physical therapy. Also, patients were evaluated in three phases: initial, at the end of hospitalization (14 days) after carrying out medical rehabilitation assistance and one month, at the end of kinetic program and after another 14 days of rehabilitation). **Results and discussion.** The evaluation of the two patients groups on the first and the last day of rehabilitation therapy using VAS scales, degrees of mobility and travel time distance of 20 meters reveals the following results: amplitude of motion of the knee showed a significant increase occurring at each reassessment. Knee mobility increase to the first group compared with the second and VAS pain scale were increased after treatment in both groups. Making treatment lead to improve your output in each group so every group increase growth rate of movement, without pain or discomfort from treatment. There is substantial decrease in the knee arthritis pain which has improved the joint mobility on different types of daily movements. **Conclusions.** Knee region is a complex anatomical and functional characterized by double role: to support the entire weight of the body and the preservation of properly walking on any terrain. The role of locomotion-term leverage, while providing knee stability and mobility, balance and swing, acceleration and deceleration. Therapy was established by the department team: medical rehabilitation, physiotherapist, physiotherapy assistant, masseuse. They prefer physical therapy instead of drug therapy for patients affected by chronic rheumatic degenerative diseases (including knee arthritis) due to significant effects of this therapy and also because this kind of therapy have no side effects.

**Keywords:** *physical therapy, primary or secondary knee osteoarthritis, rehabilitation.*

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## **REZUMAT. Efectele kinetoterapiei în recuperarea medicală a genunchiului.**

**Introducere.** Studiul a fost efectuat pe un lot de 30 de pacienți cu vârsta peste 40 ani, diagnosticați cu gonartroza primară sau secundară. **Material și metodă.** Pacienții au fost împărțiți în două loturi: un lot de control (n=14) care a beneficiat de electroterapie, masaj și medicație simptomatică antialgică și lotul activ (n=16), al cărui program terapeutic a cuprins electroterapie, masaj și kinetoterapie. De asemenea, pacienții au fost evaluați în trei faze: F1- inițial, F2- la sfârșitul perioadei de spitalizare (după 14 zile), după derularea asistenței medicale de recuperare și F3 - la o lună, respectiv la sfârșitul programului kinetic, după încă 14 zile de recuperare). Evaluarea pacienților s-a făcut în ziua 1 și după 4 săptămâni, cu ajutorul scalei analog vizuale pentru evaluarea durerii la mișcarea pasivă și activă (VAS). De asemenea au fost evaluați și alți parametri, precum mobilitatea în articulația genunchiului (în grade) pe mișcarea de flexie. **Rezultate și discuții.** Realizând evaluarea pacienților din cele două grupuri, după parametrii prestabiliți (scala VAS, grade de mobilitate și timp de parcurgere a distanței de 20 metri), în prima și ultima zi a terapiei de recuperare, s-au obținut date a căror interpretare duce la următoarele: evaluarea amplitudinii de mișcare prin goniometrie la nivelul mișcării de flexie a genunchiului a demonstrat o creștere importantă a valorii acesteia, o creștere semnificativă producându-se la fiecare reevaluare; la fel și pentru mobilitatea genunchiului la mișcarea de flexie. Scala VAS a durerii, după aplicarea tratamentului s-a îmbunătățit semnificativ la ambele grupuri.

În privința evaluării timpului de parcurgere a distanței de 20 de metri, pe teren plat, ambele grupuri realizează creșterea vitezei de deplasare, fără durere sau disconfort, în urmă tratamentului efectuat. **Concluzii.** Din rezultatele obținute de-a lungul desfășurării experimentului rezultă următoarele concluzii:

- Genunchiul asigură concomitent stabilitatea și mobilitatea, echilibrul și oscilația, accelerația și decelerația.
- Terapia constituită s-a recomandat de către echipa secției: medic recuperare, kinetoterapeut, asistent fizioterapeut, maseur.
- Prin individualizarea strictă a programului de kinetoterapie în concordanță cu starea biologică și psihică a pacientului
- S-a preferat terapia fizică și kinetică celei exclusiv medicamentoase în cazul pacienților cu afecțiuni reumatismale cronice degenerative

**Cuvinte cheie:** *kinetoterapie, gonartroză primară sau secundară, recuperare medicală.*

## **Introduction**

Knee arthritis occurs mainly in obese women after 45 years, consisting anatomically of femoral-patellar and femoral-tibial osteoarthritis. Knee arthritis, with an superior incidence to hip arthritis, but being for a long time well tolerated, is frequently encountered in rheumatology and rehabilitation services, but today begins to be increasingly more often treated in the orthopedic services. Primitive

knee arthritis - whose causes are not well known, appear in most statistics, with a marked predilection for women, at menopause age. From 4 patients with knee arthritis, clinical onset is between 40 and 70 years, with a maximum at 50, and is usually located in the femoral-patellar compartment to diffuse finally through the whole joint. There are frequent associations with obesity (45 to 65%) and varicose veins (20 to 44% of cases). Often meets almost typical picture of a patient around menopause, obesity, with large pool, lordosis, short legs, globular and painful knees, with *genu varum* and *flexum*, most often within an arthritis located in many articulations. Knee osteoarthritis appear side by flaws in architectural structures of the knee. The early clinical onset is in the third or the fourth decade of life and is usually unilateral (bilateral osteoarthritis if the above condition takes both knees) and is not accompanied by changes in osteoarthritis of other joints. Medical statistics now give 53% apparently primitive forms, compared to 47% secondary forms. Knee arthritis to obese people are also secondary caused by knees overweight. This study aims to highlight the effects of physical therapy in the rehabilitation of a 30 patients group diagnosed with primitive or secondary knee arthritis, unilateral or bilateral.

### **Materials and methods**

The study was conducted on a group of 30 patients older than 40 years, diagnosed with primary or secondary knee arthritis unilateral or bilateral, to their admission into the service of Physiotherapy and Rehabilitation Medicine, who were divided in two groups: a control group (n = 14) who received electrotherapy, massage and medical symptomatic pain relievers and the active group (n = 16), whose therapeutic program included electrotherapy, massage and physical therapy. Also, patients were evaluated in three phases: initial F1, F2, at the end of hospitalization (14 days) after carrying out medical rehabilitation assistance and F3 - one month, at the end of kinetic program and after another 14 days of rehabilitation).

The criteria for inclusion in this study include:

- Patients and of both sexes, aged 40 years;
- BMI = 35 kg/m<sup>2</sup> (BMI – body mass index);
- Disease duration longer than 6 months.

Criteria for exclusion from the study were composed of:

- chronic rheumatic diseases (rheumatoid arthritis, ankylosing spondylitis, gout);
- presence of special co-morbidities (Diabetes or hypertension uncontrolled, severe liver or kidney disease, cardiorespiratory disease, obesity, cancer, trauma).
- those patients who used oral corticotherapy and those who made arthroscopy;
- the presence of psychiatric illnesses.



Evaluation of patients was done on day 1 and after 4 weeks, with Visual Analog Scale –(VAS).

Were also assessing the ether parameters such as the knee joint mobility (degrees) on the flexion/extension movement.

Patients included in this study are suffering of knee arthritis (clinical diagnosis and radiological staged).

Evidence bears out the following exam:

- 1 unilateral or bilateral damage to the knee;
- 2 the presence of spontaneous pain on palpation or on joint mobilization
- 3 inflammatory changes of the affected joints;
- 4 joint mobility, held or lost;
- 5 the condition of muscles (hypotonia, contracture or shift);
- 6 knee stability during gait and standing up;
- 7 alignment of lower limb joints in the spinal cord;
- 8 nutritional status of the patient.

Radiological aspects covered in knee x-ray are:

- o narrowing of joint spaces;
- o subchondral sclerosis;
- o marginal osteophytosis;
- o pseudocysts or geodes.

Electrotherapy techniques aim to obtain the painkillers effects or to stimulate the muscle atrophy. (Quadriceps). For the painkiller and hyperemic effect we used galvanic currents (dry galvanizing or galvanic baths), low frequency currents and TENS - (Electrical neuromuscular stimulation transcutaneous), Trabert currents, diadynamic currents, interference currents, laser, ultrasound, solux (infrared radiation) and shortwave.

Prevention of muscle atrophy is achieved by a series of electrical procedures stimulating the muscle contraction named low frequency currents (diadynamic RS currents and rectangular currents), the average frequency currents.

Physical therapy programs toning the skeletal muscle, restore the knee joint mobility and the dynamic control for walking.

Massage composed by sedative techniques on joint structures and toning techniques on adjacent muscle can be used to preparing the physical therapy and thereafter.

Also we can use physical therapy:

- Stretching;
- Aerobic Exercise, such as pedaling the bike (dynamic exercises) - a joint training (both for strength and for resistance).

And set the following parameters:

- intensity - determined in accordance with the principle of charging, that is greater than that used daily by everyday activities, above the training stimulus that causes an adaptive response of the body, it worked to a value of 70-85% of maximum heart rate (corresponding to 60-80% of VO<sub>2</sub> max) initially, then the value of 40% maximum oxygen consumption is V<sub>O</sub>max during exercise, maximum heart rate was determined by the formula 220-age (in years) the patient concerned;
- time - "the more intense the exercise is its duration will be the less", average session was 20-30 minutes (intensity being 70 of% of maximum heart strength);
- frequency - was 1 session / day.

Any kinetic treatment involves restoring functional knee entire distal segment in terms of muscle forces, stability and controlled movement at this level, to prevent complications such as chronic instability and osteoporosis by deconditioning syndrome.

Physical rehabilitation program - applied to a patient with knee arthritis kinetic must have:

- Obtain status of painless,
- correction of trophic isturbances
- knee stability and the dynamic control for walking,
- regional mobility for functional movement amplitude,
- coordination of limb movements and segmentation as a whole.

Any program should include exercises kinetic mobilization, first active, muscle toning, muscle stretching, to complete the exercises overall, represented by multiple variants of walking exercises and techniques to facilitate the balance exercises, always tailored to the severity pathology and patient's possibilities to perform well using material within the base of treatment options. Foot physical therapy should not be overlooked in the context of lower leg kinematics chain, essential for proper function, optimal.

**Table no. 1.** Distribution of cases

	<b>No. cases</b>	<b>45-50 years</b>	<b>&gt; 50 years</b>
Men	7	4	3
Women	23	18	5
Total	30	22	8

All patients in this study group learn to control their steps through the following aspects: it involves movement step is carried out slowly, carefully run, the movements goes to the other mobile segments of the body; movements are smooth, without jar, to achieve simultaneous control of respiration.

**Table no. 2.** Frequence of knee arthritis

Knee arthritis	No. cases
Primitive	17
Secondary	13

To assess patients have used the following parameters:

**1. Motion's amplitude** (goniometry) in knee joints: knee extension (affected by atrophy of the quadriceps), knee flexion (row reduced pain, inflammation and joint immobilization).

**Table no. 3.** Evaluation of knee flexion amplitude at the beginning of therapy (F1) and at end kinetic recovery by age group.

Age group	45-50 years		> 50 years	
Stroke assessment	F1	F3	F1	F3
Flexion	85 degrees	114 degrees	81 degrees	103 degrees

**2. For the pain** parameter we used **visual analogue scale (VAS)** which patient was self-assessment in terms of pain intensity with a number from 0-100 (0 = absent pain, 100 = maximum pain).

**0** ————— **100**

In our case, the patient marks a point between the two values, depending on subjective perception of pain to active mobilization of the knee.

To assess the effect of therapy painkillers have used visual analogue scale VAS therapeutic outcome.

*VAS for the treatment*

**No pain relief (disappearance of pain)**

**Complete**

**0** ————— **100**

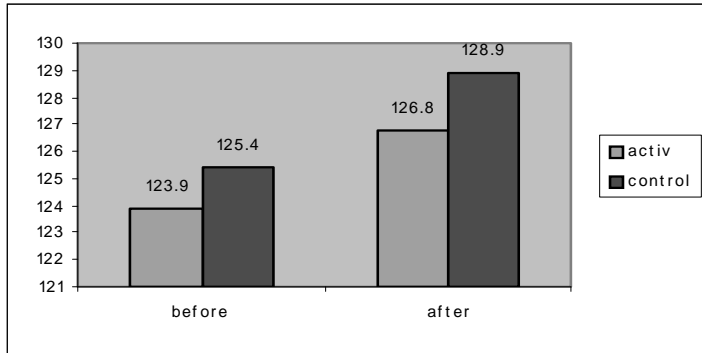
**3. Travel time for 20 meters distance.** We evaluate the time travel for 20 meters on flat ground, normal walking, before and after the treatment.

## Results and discussion

The evaluation of the two patients groups by preset parameters (VAS scales, degrees of mobility and travel time distance of 20 meters) on the first and the last day of rehabilitation therapy leads to the following results:

Amplitude of motion by goniometry in the movement of flexion of the knee showed a significant increase in its value (from 35° to 120°) by comparing the moments evaluations, a significant increase occurring at each reassessment.

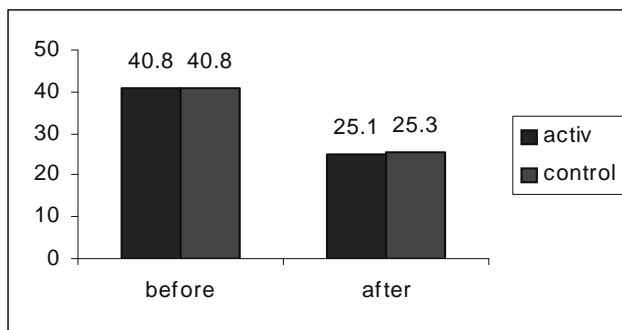
Knee mobility flexion increase from  $123.9^{\circ} (\pm 12,5^{\circ})$  to the first group and  $125.4^{\circ} (\pm 14,8^{\circ})$  to the second, the final average values of  $126.8^{\circ}$  respectively  $128.9^{\circ}$ , improve output of  $3.5^{\circ} (\pm 4,8^{\circ})$  in the active group and  $4.5^{\circ} (\pm 8.3^{\circ})$  in group control.



**Figure 1.** Evolution of the knee mobility parameter on knee flexion

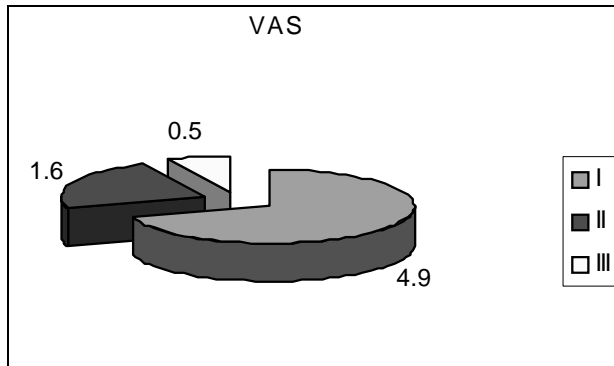
VAS pain scale show an initial average 40.8 mm for both groups, with maximum–minimum values  $\pm 16,4$  mm to active group and  $\pm 15.5$  mm to control group.

After treatment the values of both groups were increased,  $15.6 (\pm 15.3)$  mm to the first and  $15.3 (\pm 15.3)$ mm, the second ( $p = 0.469$ ), reaching values final average of 25.1 mm and 25.3 mm.



**Figure 2.** Evolution of the pain parameter to active motion

There is substantial improvement of pain in knee osteoarthritis on the active movements.



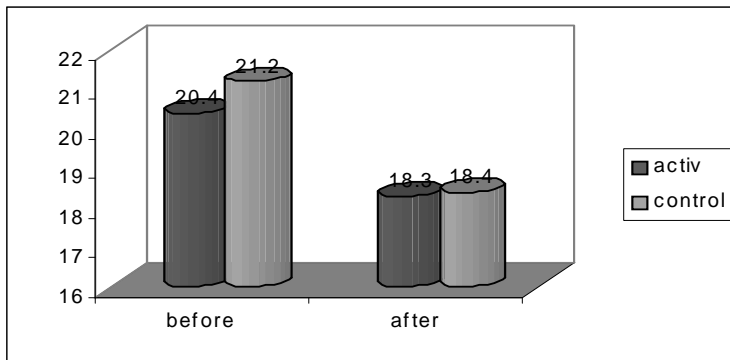
**Figure 3.** VAS score evaluation

Individual appreciated the three moments of evaluation and then to calculate the average and confidence interval CI for group study and sex.

Travel time to distance for 20 meters.

In terms of evaluation time distance for 20 meters on flat ground, we obtained content an average value of 20.4 ( $\pm 9.3$ ) seconds, active group and 21.2 ( $\pm 6.2$ ) seconds, for the control group.

Making treatment lead to improve your output in each group 2.1 ( $\pm 2$ ) seconds, the first group and 2.8 ( $\pm 3$ ) seconds ( $p = 0.054$ ), in the second group reaching final average values 18.3 seconds, 18.4 seconds. Both groups achieved increases growth rate of movement, without pain or discomfort from treatment.



**Figure 4.** Evolution of the parameter travel time distance of 20 meters

There is substantial decrease in the knee arthritis pain which has improved the joint mobility on different types of daily movements.

## Conclusions

From the results obtained during the conduct of the experiment was based on work we have drawn the following conclusions:

- ✓ Knee region is a complex anatomical and functional characterized by double role: to support the entire weight of the body and the preservation of properly walking on any terrain. The role of locomotion-term leverage, while providing knee stability and mobility, balance and swing, acceleration and deceleration.
- ✓ Therapy was established by the department team: medical rehabilitation, physiotherapist, physiotherapy assistant, masseuse.
- ✓ The work was always guided by the patient's response to the technique applied.
- ✓ The individualization of physical therapy program in strict accordance with biological and psychological condition of the patient (medication, physical, kinetic), we obtained clinical symptoms and shorten treatment duration.
- ✓ They prefer physical therapy instead of drug therapy for patients affected by chronic rheumatic degenerative diseases (including knee arthritis) due to significant effects of this therapy and also because have no side effects.

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## PHYSICAL ACTIVITY STYLES PRACTICED IN GYMS

COSMIN PRODEA<sup>1</sup>, ALEXANDRA GIURGIU<sup>1</sup>

**ABSTRACT.** In the following article, we have tried to present you some information regarding a few physical movement styles that you can find in the gyms in our country. We focus on Kangoo Jumps, Pilates, Qigong, Tae-Bo, Tai-Chi and Zumba.

One by one we took each exercise type and we gave a detailed presentation about its history, description of how to do it and if needed we listed the necessary equipments required for the given exercise. We also presented the major benefits of each exercise style that has over a certain body part, and the places where you can practice it, so when you are done reading this article, you are capable to decide - based on your affections, the results you want to obtain and on the vitality that you have - which type of movement you want to try out in order to obtain maximal personalized effects.

**Key Words:** Kangoo Jumps, Pilates, Qigong, Tae-Bo, Tai-Chi, Zumba, moving, sport

**REZUMAT. Stiluri de mișcare fizică practicate în sălile de sport.** In articolul care urmează am încercat să vă prezentăm informații privind câteva stiluri de mișcare fizică prezente în sălile de sport din țara noastră, mai exact despre Kangoo Jumps, Pilates, Qigong, Tae Bo, Tai-Chi, Zumba.

Rând pe rând am luat fiecare tip de mișcare și le-am detaliat prezentându-va istoricul acesteia, descrierea modului de executare și a eventualelor accesorii pe care le presupune practicarea lui, beneficiile pe care le aduce fiecare stil în parte, asupra căror părți și sisteme anatomice are un mai mare impact, precum și locurile unde pot fi practicate, astfel încât la finalul citirii articolului să fiți în măsură să decideți, în funcție de afecțiunile pe care le aveți, de rezultatele pe care doriți să le obțineți și de vitalitatea de care dispuneți ce tip de mișcare doriți să o încercați, să obțineți efecte personalizate maxime.

**Cuvinte cheie:** Kangoo Jumps, Pilates, Qigong, Tae-Bo, Tai-Chi, Zumba, mișcare, sports

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## **Introduction**

*Mens sana in corpore sano* is not a saying; it is a concentrated expression of reality. A healthy mind is conditioned by the existence of a healthy body. In this situation it is shown that we have an obligation, not just enjoyment, to keep our body healthy.

We come from ploughmen, smiths, and so on, the ordinary people who unconsciously, without having access to all the theories of existentialism retained their active body, they were constantly involved in their work and this gave them greater mental health.

It would be interesting to see the differences between physical and mental health in past times of the ordinary people compared to elite (kings, princes, noblemen), but this is perhaps the subject of another article.

Following the initial idea, we enter the wire of the world's evolution, which due to technology and progress has brought many benefits, and high degree of comfort. But it is like the consequence to the expense of physical movement, which has established sedentary life.

But because it is inevitable, man is prone to analysis and meditation, clever minds have realized the negative effect of convenience over the physical body and translated ancient movement from fields, pastures, quarrying village into the gyms.

In our present day we do not walk miles, because evolution has as a consequence the crisis of time. But what our ancestors did of inertia, we can do it consciously and in a more concentrated time in gyms.

And also because of progress we are in real-time contact with all the contents across the globe and because man likes universality, gyms do not host the same type of motion. We are borrowing sporting activities from all around the world, and the world incorporates us.

Thus, if by the 80's only "classic aerobics" was known, now we are dealing with many different styles to maintain our body in shape and to relax the mind at the same time. We identify the style that we like through analysis and we will attend that frequently. Below I try to detail some of the styles known to us.

## **KANGOO JUMPS**

***Short history: Who invented this system, when and what was the basis of it and how it was reached?***

For the first time it was presented at SISEL Sports Fair in Paris in 1994. It is the invention of Canadian inventor Gregory Lektham, but the boots were patented by Denis Naville (Switzerland). Kangoo Jumps aimed people who wanted to play sports safely without injuries on the level of the knees and spine. Many people choose to play sports and want a healthy lifestyle, but they must

take into account the strength of the bone system. Kangoo Jumps have been extensively studied and refined by results. Studies have been made in Australia at Lismore University and also at the University of Lausanne in Switzerland. There are four generations of Kangoo Jumps boots and the latest Kangoo Jumps boots are the XR3 that are used in the gyms. No other models of boots are allowed in the gyms. What is special about this model is that it has a sole support that protects the column upon impact with the ground. During running, if we use boots, chances of ankle, spine and knee injuries are reduced. All persons using Kangoo Jumps during training recognize that they feel really good, and the boots inducing them in a euphoric state. By stretching bands and elliptical arcs, Kangoo Jumps is an invention designed specifically for protection against strike. (<http://www.cubicicleta.ro/2010/04/kangoo-jumps-o-disciplina-neconven-%C8%9Bionala-a-aerobic/>)

By stretching bands and elliptical arcs, Kangoo Jumps is an invention designed specifically for protection against strike.



### ***Description***

Kangoo Jumps is a new sport, appeared in gyms, which combines traditional aerobic movements with Tae-bo. The difference compared to the regular classes is not only because of the special shoes that force you to take an extraordinary impetus, like a kangaroo, that can put your body in danger if you have problems with balance. Shoes are the result of 11 years of research and their creators say they can be used by anyone between ages of 6 and 90 years, who can stand on their feet without assistance.

With Kangoo Jumps you will burn many calories you will get rid of unwanted pounds, because it stimulates the lymphatic system. The lymphatic system is the fluid that circulates between our cells in order to carry waste and toxins from the body and keeping it healthy.

### ***The benefits of Kangoo Jumps***

"Only the fact that requires you to a more alert and coordinated "walk" when you wear the boots is considered an important benefit. Even NASA specialists were surprised by the benefits of this type of shoe, as one of the most renowned researchers said that these exercises are the most effective ones ever invented by man. Why? Because Kangoo Jumps shoes helps to avoid inconveniences that you encounter when doing sport with ordinary shoes - pain in the soles from the impact with the ground will disappear! You will lose weight more quickly, experts say you can burn as many as 800 calories per hour and you will boost your

physical endurance. Cardiovascular circulation will improve and your heart will become happier and healthier. You will see that stress will leave you like magic. You will have so much energy that you've never felt in months. Leg bones will be strengthened and your thighs will look more defined. You will have a queen posture, because this sport requires you to keep your back straight. (<http://revistaplafar.Ro/antreneaza-te/752/kangoo-jumps-corp-perfect-pentru-distractie-maxima.html>).

Ideal for joints, Kangoo Jumps boots reduces with 80% the impact of the body with the ground.”

### ***Benefits:***

- Increases resistance to stress
- Strengthens cardiovascular system (VO2 Max)
- Strengthens the spine and intervertebral discs
- Helps to adopt the correct position of the spine
- Mechanic reception and proprioception: balance and coordination
- Stimulates bone reconstruction (osteoblastic)
- Increased fat burning (stimulates lymph nodes)
- Increase motivation
- Maximizes muscle contraction due to positive and negative gravity
- Reducing pronation and supination

### ***History of Kangoo shoes***

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### ***Where to practice***

There is no difference between indoor and outdoor boots. Boots used in the gym and for running are Kangoo Jumps XR3. With the same boots can make a program in the gym and outside. The program itself is different. Outside you run more, but breathe fresh air while in the gym there is choreography. We play.

## **PILATES**

### ***Short History***

Pilates was developed by Joseph H. Pilates (born in Germany) during World War with the aim to improve the rehabilitation of returning war veterans.

Joseph Pilates was born in 1880 in Germany, was the first to develop Pilates movements. He created this system when he was imprisoned during World War I and realized that prisoners need training for the body, mind and soul. Pilates said, "*The mind is the one that builds the body.*" The Pilates program does only the following: it is mental and physical improvement which aims the mind to function in balance, economy and grace in order to achieve a high degree of harmony, physical and mental health.

Joseph Pilates said that mental and physical health are essential to one another. He recommended some control movements to help the wounded soldiers in strengthening their health through stretching and stabilizing key muscles. Originally it was a medical method, and now as a form of fitness for the body and soul. ([http://gym.cs-transilvania.ro/page/pilates\\_istoric](http://gym.cs-transilvania.ro/page/pilates_istoric))

### ***Description***

Pilates is a new sport that teaches the principles of relaxation, concentration, alignment, breathing, centering, alignment, fluidity of movement and strength of mind. The Pilates method develops the harmony of the body, enhances wellbeing throughout the body and tones the entire muscle system.

Breathing is very important throughout the exercise. The basic rule is to exhale at the most difficult part of the exercise and inhale when you relax. Also, when doing Pilates workout, you should strain all muscles in your body.

The exercises are simple, they are performed slowly, focusing on all movements and breathing. A proper breathing allows oxygen circulating through the blood to remove toxic substances that cause fatigue and pain. It is not a strenuous workout, but is even known for its energizing properties.

"Pilates called his method *Contrology*, saying that the exercise uses the mind to control the muscles. The program focuses on the muscles in the back, which helps to keep the body balanced and which are essential to support the spine." ([http://gym.cs-transilvania.ro/page/pilates\\_istoric](http://gym.cs-transilvania.ro/page/pilates_istoric))

Pilates helps especially the awareness of breathing and alignment of the spine, and aims to strengthen the trunk muscles.

These exercises have great advantages and can be practiced by anyone, regardless of age, sex or physical condition, with minimal risk of getting hurt.

### ***Advantages / benefits***

Reasons to try Pilates method:

- Increases muscle tone;
- Reduce stress;
- Increases joint mobility;
- Improves circulation and posture of the body;
- Gives energy and vitality for the entire body.

Mainly, this type of exercise increases joint mobility, flexibility and agility of the whole body, hence gives an increased resistance to physical force and effort;

If practiced regularly, Pilates movements increase lung capacity and has beneficial effects on blood circulation in the body;

Pilates corrects the position of the back by reducing pain caused by sitting incorrectly in the office chair;

By practicing Pilates it will obviously improve the sexual life.

Pilates is a unique form of exercise that provides the body with many benefits:

- Reshapes the body;
- Thins the waist;
- Tones the muscles;
- Improves the posture;
- Tones the whole body;
- Reduces back pain;
- Increases joint mobility;
- Strengthens the heart muscles;
- Improves circulation;
- Increases flexibility;
- Improves athletic performance;
- Protects against seasonal diseases;
- Reduces stress and tension and helps increase energy levels;

### ***Materials***

Pilates exercise technique includes both the ground running and elements that involve the use of objects such as balls, straps, elastic mattresses that you find in aerobic rooms and in specialty stores.

### ***Where to practice***

If you want to practice Pilates at home, there are many programs on the Internet and on DVDs that can help. If, however, you decide that you would prefer to practice Pilates in a gym, there are certified instructors in the country.

## **QIGONG**

### ***Short history***

Qigong has been practiced in secret for over 5000 years and is one of the best kept secrets. Transmission from generation to generation was the direct path. Few classic texts that provide information about the system are written intentionally in coded terms (Daniel Reid, preface). Today, in the information age, Qigong has become known worldwide and ancient secrets that were kept they are now open worldwide. Specialized studies conducted in Asia and elsewhere show the effectiveness of Qigong in the treatment of many diseases for which western medicine offers only temporary remedies. Also, many hospitals include medical qigong as an aid in treating certain diseases.

In general, Qigong is associated with the practice of Tai Chi, an internal martial art, which can be considered a moving Qigong practiced by many people just for the health benefits. (<http://ro.wikipedia.org/wiki/Qigong>)

### ***Description***

The word "Qigong" can be translated as "mastery of Qi (energy)." Qigong includes physical exercise combined with meditation and breathing techniques and has a direct effect on the energy meridians.

Qigong can be practiced by anyone, regardless of age, nationality, race, sex, religion, political views or health condition.

### ***Advantages and Benefits***

- stress management
- highly effective in preventing diseases
- includes valuable healing techniques
- development of intellect and memory
- development of special abilities, latent energy depending on the particular body of each individual
- quick advancement in practice

Qigong practice has its immediate effects on the body: increasing immunity and adjusting all functions of - metabolism, respiratory system, circulatory and digestive system, blood pressure, sleep, and autonomic nervous system, inducing a state of relaxation. This exercise can be practiced 24 hours a day, thus becoming a lifestyle.

The perseverance practice leads to self-control of mental states, eliminating negative emotions, acquiring a state of relaxation and mental tone, also leading to the emergence and the development of the potential of body, mind and spirit.

### ***Materials / Equipment***

If you've decided to practice qigong it is necessary that you find a teacher, to establish contact with colleagues, to travel far to follow courses, all this require

money, especially now that you can not make even one step without money. The principle of studying Qigong is that it does not allow thinking of only receiving without thinking that you have to give something in return.

A qigong master, regardless of how great its skills are, in everyday life is only human and can not dispense from the material part. In life you need the money and the seller will not give you the merchandise for free, even if recognizes in you a qigong master.

### ***Where can you practice Qigong***

Qigong is a very economical exercise. You do not need equipment, tools, or a playground as you need for soccer (football) or basketball, nor do you need a ball. If you have enough space to sit down or stand, an area with good ventilation is already sufficient. For starters, you might pay a fee to learn from a master, but then you can practice alone at home, without the need to pay someone.

Qigong can be practiced according to your own schedule. Even though there are certain hours recommended to practice it in a more effective way, this is not an obligation. In addition, you do not need a partner, so when you want, you can practice.

## **TAE-BO**

### ***Short history***

**Billy Blanks** is the creator of Tae-bo, a revolutionary fitness system that is number one in America. Billy became in 1975 America's first Amateur Athletic Champion, a title which he then won five times, scoring seven level black belt in Tae Kwon Do and 5 other black belts in martial arts.

He was seven times world champion in karate and has trained U.S. karate team, obtaining 36 gold medals in international competitions. Blanks invented Tae-bo in 1989 when he had the idea of doing Tae Kwan Do style movements while listening to music. He taught the first courses in the garage of his home in Los Angeles. Since then, the method has spread all over the world, but Blanks still teaches four courses per day. He seasonally trains U.S. military troops on the mission in Iraq, Bosnia, Kosovo, Sarajevo, Greece, Africa, Germany and Italy.

The name comes from the combination of **t**ae kwon do and **b**oxing. Later, Billy Blanks wrote an acronym: Total Awareness Excellence Body Obedience.

### ***Description***

Tae-bo is an attractive combination between aerobics, ballet, karate, boxing, hip-hop dancing and weight training. Why Tae-bo gained so much ground to classic sports? Because it is fun, energizing and effective: in one hour struck, thrust, stretched and leapt you lose twice more calories than traditional aerobics! (<http://www.kudika.ro/article/beauty~wellness/4187/tae-bo-800-kcal-ora.html>)

### ***Advantages***

It is good for blood circulation; you work all the muscles in the body, you stimulate the production of endorphins (hormone of happiness) and this exercise will release stress. Many people say that after training they feel energized and full of life!

This "sport" improves balance, coordination, mobility, strengthens muscles and even bone system.

Tae-Bo resembles also martial arts exercises, but it is not a self-defense course. Exercises with a greater degree of difficulty, involving high leg kicks and jumps are characterized by high demand of the entire body and are the ones that will help you burn calories. Tae-Bo can be a great cardiovascular workout when practiced correctly.

Tae-bo is good for blood circulation, it works your muscles throughout the body, stimulates the production of endorphins (happiness hormone), increases oxygenation and it is indicated for the smokers (can be used in tobacco cessation therapy), stimulates tissue regeneration, increases immune system tone, retains youth and relieves stress. Many people say that after training they feel energized and full of life!

### ***Contraindicated***

Tae-bo, is a sport involving heavy energy consumption and it is not indicated for persons who have heart disease, asthma in acute crisis or other chronic diseases that prevent physical effort. (<http://vovinam-yang.blogspot.ro/2011/02/tae-bo-frumusete-tonifiere-rezistent.html>).

There are many benefits to those who practice Tae-bo. First we lose weight and we get a toned and enviable body. Tae-bo improves balance, coordination, mobility, and the muscle and skeletal system are enhanced. Through daily practice of this sport for 30 minutes, we will see an improvement in the immune system and blood circulation, Tae-bo being a good cardio exercise. Tae-bo reduces the risk of diseases such as diabetes, obesity or various heart problems.

Unfortunately Tae-bo has the disadvantage of being a sport practiced not just in reach. It is quite difficult for beginners to start such a program alone especially if knowledge and skills for martial arts and aerobics are minimal. Usually, beginners need a coach that will gradually increase the intensity and difficulty of exercises practiced.

### ***Materials***

Equipment required: Towel, sports equipment, sneakers.

### ***Where can Tae-Bo be practiced***

Are not tempting by idea to buy DVDs and practice Tae-bo at home, the best option is to choose one of the gyms where you can practice Tae-bo.



## TAI-CHI

### *Short history*

"Calisthenics and breathing exercises apparently existed since the 1100s BC. Stories about the appearance of Tai Chi Chuan came only later, when art was already widespread. Some rumors say that it was created by Chan Sang-Feng after he witnessed a fight between a crane and a snake, including their movements in a fighting style that combines the advantages of both style, other rumors say that he had received inspiration through a series of dreams. Other stories put the origin of Tai Chi Chuan in the Tang Dynasty era, where General Ming designed a fighting style for imperial soldiers." ([http://ro.wikipedia.org/wiki/Tai\\_Chi\\_Chuan](http://ro.wikipedia.org/wiki/Tai_Chi_Chuan))

"For centuries the art of Tai Chi Chuan, was kept secret and transmitted from generation to generation. Initiation progress was slow and masters were demanding huge payments or services in exchange for teaching these powerful martial arts. Wider spread occurred with the appearance of firearms, in the same time the martial arts began to lose ground. Firearms did not require too much training and have a major advantage with the ability to remotely kill even in the hands of unprofessional. The future of martial arts seem less happy, but a big change occurred when they were reshaped focusing on the benefits of health, inner balance, discipline and self-control." ([http://ro.wikipedia.org/wiki/Tai\\_Chi\\_Chuan](http://ro.wikipedia.org/wiki/Tai_Chi_Chuan))

### *Description*

*Tai Chi* as practiced today in the West and in our country can be defined as a moving form of yoga combined with meditation. There are a number of so-called "forms" or "sets" that consist of a chain of movements. Many of these movements originate from martial arts (and perhaps even ancestral gestures imitating the behavior of animals and birds) although the way in which they are performed is slow and graceful with smooth and delicate transitions from one to the other. Adults, practicing **Tai Chi**, do not set as their main goal to train in martial arts but first, they want to mobilize a meditation exercise through the body. In Chinese philosophy and medicine, there is the fundamental concept of "chi", a vital force that animates the body. One of the aims of Tai Chi is to stimulate circulation of "chi" inside the body, believing that in this way an individual's health and vitality can be improved.

Another aim of *Tai Chi* discipline is inducing a state of serenity and relaxation of mind produced by these specific exercises. Learning how to practice correctly these movements opens an initiation of balance, lighting, subtle adjustment of the locomotor, rhythm and natural movement and body movement starting from its vital center. In this way, the study of Tai Chi can help to improve the ability to have a correct vertical position, to walk smoothly or to run in your own pace. Moreover, accompanying meditation exercises are able to bring you beyond everyday stress and rise above small but significant everyday problems.

Since Tai Chi movements have their origins in martial arts, practicing them can help you learn the various techniques of self defense. The combined movements of two persons, named in Anglo-Saxon term "push-hands" ("pushing hands"), principles or instincts of sensitivity are developed and respond to the vital "chi" energy of another human being. People who practice Tai Chi for a long time are often inclined to develop their skills in martial arts. In fact, Tai Chi technique is capable of directing your potential destructive energy in a form in which it no longer means danger to those around you." ([http://www.doctor.info.ro/tai\\_chi\\_chuan,un\\_dans\\_energetic\\_de\\_viata\\_lunga.html](http://www.doctor.info.ro/tai_chi_chuan,un_dans_energetic_de_viata_lunga.html))

### ***What is Tai Chi?***

"Tai Chi Chuan means the action (tai) of the internal energy (chi) through hands or fists (chuan). Works with chi by practicing slow motion sequences called forms, related to the five elements theory of Yin and Yang and the I Ching. Breathing and concentration are also important to relax the body, promote emotional balance and peace of mind. Tai Chi Chuan is seen as a fight, but an internal one: you fight with yourself, with your own energy, physical, emotional blockages etc. or psycho-mental and emotional nature (ignorance, laziness, fear, envy, pride, resentment, etc.). They can be wiped out by reaching a state of great physical and mental health by expanding the field of knowledge and addressing spiritualized lifestyle." ([http://www.doctor.info.Ro/tai\\_chi\\_chuan,un\\_dans\\_energetic\\_de\\_viata\\_lunga.html](http://www.doctor.info.Ro/tai_chi_chuan,un_dans_energetic_de_viata_lunga.html))

### ***Benefits of Tai Chi Chuan***

"In the body, Tai Chi Chuan exercise improves coordination, flexibility and balance, increases skeletal muscle strength and endurance, massaging the internal organs and improves their functionality. In this way, the joints become flexible, muscles will be less tensed and the body is purified. In other words, Tai Chi Chuan contributes to the rejuvenation of the entire body, providing flexibility and agility for the body." ([http://www.doctor.info.ro/tai\\_chi\\_chuan,un\\_dans\\_energetic\\_de\\_viata\\_lunga.html](http://www.doctor.info.ro/tai_chi_chuan,un_dans_energetic_de_viata_lunga.html))

In terms of benefits on the psychological level, the technique helps to remove daily stress, anxiety and fatigue, strengthens the will and opens the soul, refining and enhancing perceptions. Because it takes concentration to perform exercises, Tai Chi Chuan stimulates the process of installing a state of calm prevailing inner psychological harmony and balance.

### ***Tai Chi Chuan recommended for cardiac patients***

"Tai Chi Chuan exercises can be performed by any person, regardless of age or sex. Moreover, they are recommended as an aerobic for the elderly and relaxing exercise for cardiac patients. In case of pregnant women in advanced months, the exercise will avoid certain movements involving the perineum and bending of the body. Also, people who have severe joint problems or pain, will

begin practicing with caution, without forcing leg joints. Tai Chi Chuan is contraindicated in acute states of intoxication, fever or any organic emergency." ([http://www.doctor.info.ro/tai\\_chi\\_chuan\\_un\\_dans\\_energetic\\_de\\_viata\\_lunga.html](http://www.doctor.info.ro/tai_chi_chuan_un_dans_energetic_de_viata_lunga.html))

### ***Where can you practice Tai Chi Chuan***

Tai Chi can be practiced anywhere and anytime because it involves jogging, aerobics similar movements and simple relaxation exercises. Work equipment is easy and does not require additional effort in this regard. Tai Chi exercises are also available electronically.

## **ZUMBA**

### ***Short history***

"Alberto Beto Perez is the creator of Zumba Fitness. Beto, a native of Colombia (South America) is the founder of Zumba and director of Zumba Master Trainer Team. He is also a professional dancer and a famous choreographer. He collaborated with Shakira and other celebrities." (<http://revolution-studio.ro/istoria-zumba>)

"In Colombia, Zumba is slang for fun and means to move quickly. Zumba Fitness is a program that uses aerobic dance steps inspired by Latin dances such as salsa, merengue, flamenco, samba, etc. Recently other interesting dances such as hip-hop, country, etc. were added". (<http://revolution-studio.ro/istoria-zumba>)

"Beto Perez created Zumba as an accident. As he says, one day when he was in a hurry to get to aerobics class he forgot his music CDs at home. With no other alternative, he used Latin music that he used to listen in the car. Class exploded and became the most popular in Colombia. He called this class "Rumbacize". (<http://revolution-studio.ro/istoria-zumba>)

"In 1999 Beto arrived in the U.S., specifically in Miami, Florida. There he met two young entrepreneurs who convinced him to change the name into Zumba Fitness. They began to develop and advertise worldwide his fitness philosophy." (<http://revolution-studio.ro/istoria-zumba>)

### ***Description***

"Zumba is a combination of aerobics and dance taking place on different types of music. The most used and appreciated is Latin music, on various styles, from salsa, samba, merengue and continuing with African, Colombian rhythms, raggaeton, etc. The repertoire is not limited to these styles, Zumba can be practiced also on rhythms such as country, funk, rock and roll, etc..

Music used in Zumba classes is very exciting that will keep you engaged, you will enjoy every movement and after a one hour course you will go home very sweaty and at the same time with a smile on your face.

This is actually the beauty of Zumba classes and namely that you work almost all muscle groups in your body having fun and enjoying yourself at the same time. You'll have a great time and you'll sweat without you realize.

When it comes to effort, dance can not be compared to fitness training. But what if we combine them? A choreographer from the United States did this and novelty workout, he called Zumba, now enjoys a great popularity all over the world. Zumba combines the energetic Latin dance movements (as well as several international repertoires) with fitness principles on a simple choreography that is easy to learn. Zumba means "to move fast while having fun."

### ***Advantages***

**"Zumba is a fitness party!** Going to a Zumba class with your friends and colleagues is like going to the best party! It's the type of exercise that you'll want to do every day until you realize what is happening and you are already caught up in them!

**Zumba is practiced with ease!** Movements, steps that we teach are very easy to follow, making Zumba really fun and easy to "learn". Result? Men and women and even children will participate with ease and joy!

**Zumba is aerobic on Latin rhythms!** All styles of Latin dances: Salsa, Samba, Merengue, Cuba, Calypso, Reggaeton and Hiphop encourage you to move your body. And with all that Zumba is a serious workout that you will not regret. You will consider it as fun.

**Zumba is different!** Classic fitness usually contains repetitive movements, which often gets boring. The dynamic of the Zumba program is very varied, with many alternations of the more gentle rhythms and quiet that give "pause" to revive you! Of course, again for a completely different rhythm!

**Zumba is really effective!** Already after a few Zumba classes you will feel the effects of this great course! Let's not forget that ultimately Zumba is a fitness program. The most important is to remember that the whole body participates while doing Zumba – your feet, because you do movements in dance steps, your hands when we go to the next step and together with the hands the whole body will follow.

**Zumba means toning and fat burning!** "Already we all know that fat burning and strengthening, muscle modeling is the way to lose weight and tone the entire body. The big advantage with Zumba is that you do not get muscle sore because nobody requires you to do a set of repetitive and tiring exercises, but each person will go in his/her own pace and do as many as possible." ([www.artdancestudio.ro/zumba.html](http://www.artdancestudio.ro/zumba.html))

### ***Materials / Equipment***

Clothing should be comfortable, to allow movement in all parts of the body and will not disturb or irritate you. Be prepared to sweat. Cotton materials are recommended. The more the clothing is comfortable the better you'll feel, you will have more fun, you will sweat more and you will burn more calories. Don't forget to bring changing clothes and if you sweat very quickly, you can change your T-shirt.

### ***Where you can practice Zumba***

Normally, you can practice Zumba right at home, with special DVDs that you can buy on the internet, but also you can practice in gyms with qualified instruct.

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## HABILITÉS DE RELATIONNEMENT INTERPERSONNELLE ET 'INTÉRACTIVITÉ POSITIVE - RÉSULTANTES VALORIQUES DE L'ÉDUCATION PHYSIQUE ET SPORTIVE

FLORENTINA UȚĂ<sup>1</sup>

**ABSTRACT. Interpersonal Relationship Skills and Positive Interactivity-Physical Education and Sport Resulting Value.** This article represents an excerpt from a research paper focused on good practices, the analysis of socio-individual and group dimensions, moral, pedagogical, and socio-axiological values of activities specific to the non-formal physical education field in universities. We are referring to the study of interpersonal relationship abilities and positive interactions between students, with the purpose of demonstrating that physical education provides youth a favorable framework for developing group values as well as team spirit, solidarity, and cooperation skills – all values transferrable to day life. We have assessed the degree to which students socialize and their availability for group activities in four hypothetical situations; the values of the indicator of preferential status lead to conclusions revealing that physical education activities undertaken in university teach youth to work together, to assume certain roles and identify themselves in a group.

**Key words:** physical education activities, solidarity, cooperation

**REZUMAT. Abilități de relaționare interpersonală și interactivitate pozitivă-rezultante valorice ale educației fizice și sportului.** Acest articol reprezintă un decupaj al unei cercetări focalizate pe bune practici, pe analizarea dimensiunilor socio-individuale și de grup, pe valorile morale, pedagogice și socio-axiologice ale activităților specifice domeniului educație fizică nonformală din mediul universitar. Ne raportăm la studiul abilităților de relaționare interpersonală și a interactivității pozitive a studenților, cu scopul de a demonstra că educația fizică oferă tinerilor un cadru adecvat de dezvoltare a unor valori de grup, precum spiritul de echipă, solidaritatea, întrajutorarea, capacitatea de cooperare, valori transferabile și în viața cotidiană. Am testat gradul de socializare al studenților și a disponibilității lor pentru desfășurarea unor activități de grup în patru situații ipotetice propuse, iar valorile indicelui de status preferential ne-a determinat să formulăm concluzii ce evidențiază faptul că prin activitățile de educație fizică desfășurate în facultate, tinerii învață să lucreze împreună, să-și asume anumite roluri și să se autodefinească în cadrul grupului.

**Cuvinte cheie:** activități de educație fizică, solidaritate, întrajutorare, cooperare

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## **Introduction**

L'homme est un être social. La capacité de communication, propre à l'être humain, vise à établir des relations d'un certain type avec les siens et les autres. Il s'agit des relations de type informationnel qui se manifestent partout et particulièrement là, où les hommes se trouvent en relation dans ce but, de satisfaire des nécessités, plus ou moins, perçues.

Les recherches dans le domaine ont prouvé l'existence des relations entre la pratique de diverses activités physiques, la socialisation et l'intégration sociale. La socialisation par des activités d'éducation physique et sportive (dans le texte EFS), formelles et nonformelles, reflètent la manière et la mesure dans laquelle les conduites, les coutumes, les règles et les règlements acquis se transfèrent et se manifestent dans la vie sociale.

Des raisons pragmatiques et de focalisation spatiale imposent une simplification des données de ces recherches.

Il est à retenir les études prouvant que, la participation des jeunes aux activités sportives est associée à une conduite déviante réduite et aux performances académiques et sociales supérieures. De même, des enquêtes menées sur des parents ont montré que ceux-ci envisagent les activités sportives parascolaires comme une arène de socialisation pour leurs enfants dans l'esprit des valeurs et des habilités qui franchissent les bénéfices mineurs de la participation à une activité athlétique (Dumitrescu, 2010).

D'autres recherches, comme celles de Alwin (2001), Dukes et Cookley (2002) ou bien Lareau (2003) (apud Dumitrescu, 2010), mettent en évidence le fait que les parents considèrent que les activités sportives sont idéales pour déterminer aux enfants le développement des qualités dont ceux-ci auront besoin afin de s'adapter dans la société et devenir, de la sorte, des membres respectables de celle-ci. Ils considèrent que le fair-play, la discipline, le dénouement, la responsabilité, le respect de soi, la confiance en soi, etc., sont des valeurs importantes que leurs enfants ont acquises en participant à ce type d'activités.

En Roumanie, il y a plusieurs études visant cet aspect. Ainsi, Ganciu (2003) a prouvé dans une études sur un groupe d'étudiants, que la pratique des exercices physiques et d'autres activités sportives, contribue à l'intégration sociale des jeunes, favorise le développement de certains traits de caractère, ces derniers étant profondément impliqués dans la réussite professionnelle du jeune homme ; de plus, la compétition pourrait être envisagée comme une partie particulière de l'activité sociale avec une applicabilité ultérieure dans divers domaines d'activité.

En synthèse, on pourrait affirmer que les recherches dans le domaine des activités corporelles pourraient identifier des modalités par lesquelles l'éducation physique, ayant à la base des activités formelles ou nonformelles, contribue à former des attitudes favorables à l'intégration sociale des jeunes.

## Objectifs

Par l'étude de la variable définie par des habilités de relationnement interpersonnelle et interactivité positive, on a établi, comme objectif, à tester le degré de socialisation des étudiants et de leur disponibilité pour le déroulement de certaines activités de groupe.

## Matériel et méthode

La problématique abordée vise :

- la manière d'investiguer la variable mentionnée;
- les résultats enregistrés;
- l'interprétation des valeurs des données collectées.

Par l'investigation de la variable mentionnée là-dessus, on a établi comme indicateur opérationnel la valeur de l'indice du statut préférentiel.

L'échantillon, constitué à base du choix simple aléatoire, a compris trente étudiants, filles et garçons, de l'Université Technique de Construction Bucarest.

J'ai élaboré et appliqué un questionnaire sociométrique à huit items pour un groupe d'étudiants de la deuxième année d'étude, car j'ai considéré que les sujets ont eu jusqu'au moment du sondage le temps à ce connaître et à se former des opinions sur les camarades de groupe.

Les questions furent formulées en fonction des critères suivants :

- les loisirs (en général);
- la participation aux activités sportives comme loisirs;
- la coopération en vue de réaliser un tâche sportif spécifique;
- la coopération en vue de réaliser un tâche professionnell-didactique.

On a demandé aux étudiants à indiquer entre 3 et 5 collègues pour chacune des situations suggérées.

L'intérêt principal de notre démarche fut d'établir les valeurs de l'indice du statut préférentiel

(Isp). Celui-ci est considéré beaucoup plus sensible que l'indice du statut sociométrique, car le premier prend en considération à la fois les choix des sujets, et aussi leurs refus.

La formule de calcul utilisée pour déterminer la valeur de cet indice est:

$ISP = \frac{Na - Nr}{N - 1} (5)$  où

- Na- représente le nombre des choix exprimés pour le sujet;
- Nr- représente le nombre des refus exprimés envers le sujet;
- N- représente le nombre des membres du groupe.

L'indice du statut préférentiel peut avoir des valeurs positives, mais aussi négatives. Ces valeurs mettent en évidence la position des membres du groupe à l'intérieur même du groupe. Connaître ces positions nous offre la possibilité de surprendre le degré d'inclusion sociale des membres du groupe, plus exactement la mesure dans laquelle ils sont acceptés ou rejetés par le groupe d'appartenance.



Par rapport des valeurs Isp calculées pour chacun des sujets enquêtés, on a établi cinq catégories de force préférentielle, telles: populaires, leaders, insignifiants, isolés, rejetés.(4)

Dans le tableau 1, nous présentons la relation entre la valeur Isp et la position des membres à l'intérieur du groupe .

**Tableau 1.** Catégories de force préférentielle par rapport des valeurs Isp

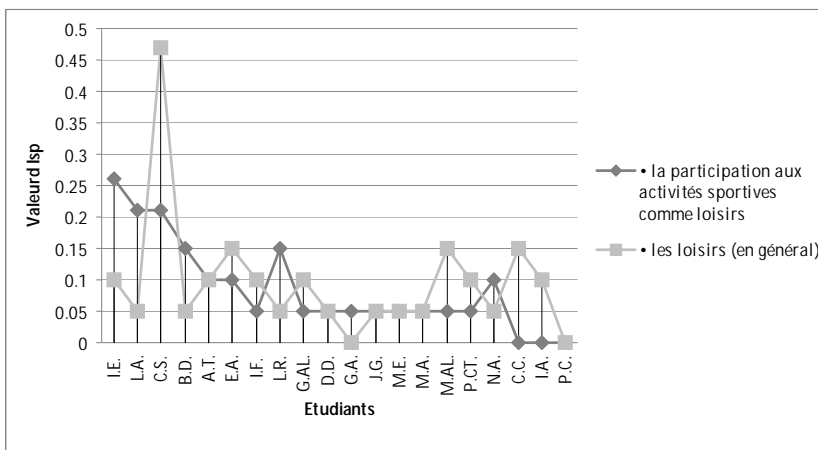
Catégories de force préférentiel	Valeur de l'indice du statut préférentiel
➤ très populaires	plus de 0,50
➤ populaires	entre 0,20 et 0,50
➤ acceptés	entre 0 et 0,20
➤ indifférents	0
➤ rejetés	valeurs négatives

Comme on a déjà affirmé, pour notre thème, on a calculé le statut préférentiel (Isp) en fonction du nombre des attractions et des refus pour chaque membre de ce groupe choisi pour l'étude en question.

Après avoir établi les valeurs de l'indice du statut préférentiel à travers les quatre situations hypothétiques, on a dressé des graphiques comparatives des valeurs obtenues pour déterminer la position des étudiants en ce qui concerne les relations interpersonnelles à l'intérieur du groupe d'appartenance.

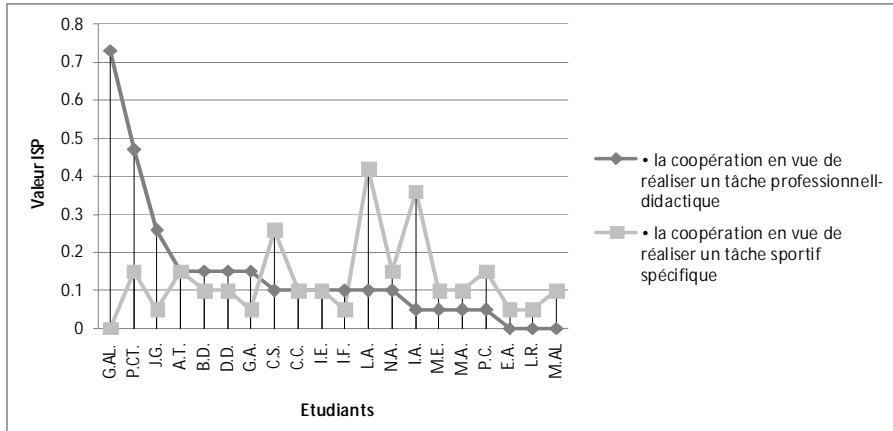
## Résultats

La réflexion graphique (fig.1) met en évidence la position de certains membres à l'intérieur du groupe vis -à- vis de leur participation aux activités sportives en plein air et aux loisirs en plein air, en général, en fonction des valeurs enregistrées par Isp.



**Fig. 1.** Le graphique comparatif des valeurs Isp pour la participation aux activités sportives en plein air et aux loisirs en plein air, en général.

La configuration iconique (fig.2), représente par comparaison, les valeurs Isp enregistrées pendant certaines activités qui supposent la coopération en vue d'accomplir une tâche sportif spécifique ou bien d'une tâche professionnelle-didactique.



**Fig. 2.** Le graphique comparatif des valeurs Isp pour les situations de coopération en vue d'accomplir des tâches communes.

### Interprétation des résultats

L'analyse des valeurs de l'indice du statut préférentiel du groupe étudié, pour les situations hypothétiques proposées, respectivement la participation aux activités sportives pendant les loisirs et pendant les loisirs en général (fig.1), met en évidence les aspects suivants de la spécificité et de la qualité des relations établies entre les membres de ce groupe :

- la majorité des étudiants a reçu le statut d'accepté dans le groupe;
- cinq uniquement des vingt jeunes étudiants n'ont reçu ni de choix, ni de refus de la part de leur collègues;
- vis-à-vis des préférences des étudiants en ce qui concerne les loisirs (en général), un seul étudiant se détache du groupe, la valeur 0,47 de son Isp lui attribuant le statut bien populaire parmi ses collègues.

L'importance des données statistiques obtenues par l'investigation visant les situations de coopération pour l'accomplissement des tâches communes, l'analyse du graphique comparatif (fig.2) associé, aboutissent aux conclusions suivantes :

- (1) trois étudiants sont bien populaires parmi leurs collègues, ceux-ci obtenant la plus haute valeur Isp pour la coopération en vue de réaliser une tâche professionnelle didactique;

- (2) au cas des activités visant la résolution d'une tâche sportif, on a rencontré une seule situation où un étudiant ne soit ni accepté ni refusé par ses collègues; cet étudiant s'absente beaucoup des cours ou des activités EFS;
- (3) en général, les membre du groupe se font des liens entre eux et coopèrent bien afin d'accomplir une tâche sportive spécifique, ou bien d'une tâche professionnelle – didactique.

### **Conclusions**

L'analyse des données recueillies et des résultats obtenus à la suite du calcul Isp pour les situations hypothétiques notées, nous ont permis à formuler des conclusions qui mettent en évidence un fait, celui que par les activités d'éducation physique déroulées à la faculté, les jeunes apprennent à travailler ensemble, à assumer des rôles et à se mieux connaître à l'intérieur du groupe.

En ce qui concerne le test visant le degré de socialisation des étudiants et de leur disponibilité pour dérouler des activités de groupe, on peut conclure qu'il existe une communication interpersonnelle positive entre les membres du groupe établi, communication basée sur confiance, coopération et amitié.

La recherche réalisée prouve sans conteste que l'éducation physique offre aux jeunes un cadre approprié pour le développement de certaines valeurs de groupe, telles: l'esprit de l'équipe, la solidarité, le self help, la capacité de coopération, l'ambition, des valeurs transférables à la vie quotidienne aussi.

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## THE RECOVERY OF PAINFUL SHOULDER TO SPORTSMEN THROUGH COMPLEMENTARY TECHNIQUES OF MASSAGE

LIVIU-ALEXANDRU TRĂILĂ<sup>1</sup>

**ABSTRACT.** *Introduction:* The low value of muscular force of scapular belt favours the appearance of this pathology at sportsmen who practice repetitive activities in joint of shoulder. *Objective:* The presentation of importance of complementary techniques of massage in the programme of posttraumatic recovery of painful shoulder at sportsmen. The examination of efficiency of recovery programmes which include different complementary techniques of massage with indications in the posttraumatic painful shoulder. *Material and Method:* The pursuit and evaluation of a lot of sportsmen with posttraumatic painful shoulder who practice table tennis, using for recovery complementary techniques of massage. *Results:* After the treatment, the evolution was favorable in all 20 cases, supervening the complete healing. *Conclusions:* The complementary techniques of massage are indispensable in the treatment of posttraumatic sequelae for restoration of functionality of the affected segment. The major indication is at the patients to which is desired a recovery most complete and in a short period of time.

**Key words:** massage, complementary techniques, trauma, evaluation, physiotherapy

**REZUMAT. Recuperarea umărului dureros la sportivi prin tehnici complementare de masaj.** *Introducere:* Valoarea scăzută a forței musculare a centurii scapulare favorizează apariția acestei patologii la sportivii care practică activități repetitive în articulația umărului. *Obiective:* Prezentarea importanței tehnicilor complementare de masaj în programul de recuperare a umărului dureros posttraumatic la sportivi. Analiza eficienței programelor de recuperare care cuprind diferite tehnici complementare de masaj cu indicații în umărul dureros posttraumatic. *Material și metodă:* Urmărirea și evaluarea unui lot de sportivi cu umăr dureros posttraumatic care practică tenisul de masă, folosind pentru recuperare tehnici complementare de masaj. *Rezultate:* În urma tratamentului, evoluția a fost favorabilă, în toate cele 20 de cazuri, survenind vindecarea completă. *Concluzii:* Tehnicile complementare de masaj sunt indispensabile în tratamentul sechelelor posttraumatice pentru restaurarea funcționalității segmentului afectat. Indicația majoră este la pacienții la care se dorește o recuperare cât mai completă și în timp cât mai scurt.

**Cuvinte cheie:** masaj, tehnici complementare, traume, evaluare, fizioterapie.

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## Introduction

The complementary techniques of massage present an exclusive therapeutic addressability. Some of the most important indications of treatment in case of posttraumatic sequelae of a painful posttraumatic shoulder, are some of the most representative complementary techniques of massage:

- the profound transversal massage
- the subjunctive massage
- criomassage
- the reflex masage type of reflexology

The analyze of efficiency of programmes of recovery which include different complementary techniques of massage with indication in the posttraumatic painful shoulder.

## Materials and Methods

It was analised the efficincy of programmes of recovery which include different complementary techniques of massage with indications in the posttraumatic painful shoulder.

- In the period 01.08.2011-01. 02. 2012 I effectuated an experimental study on a lot of 140 sportsmen who practice tabletennis, sportsmen having the age between 7 and 18 years old, students at Economic College Teodor Costescu from Drobeta Turnu-Severin. It was established the diagnostics of painful shoulder at 20 patients. The diagnostics was confirmed by family doctors, with the support of orthopaedist doctor.

- It has been noticed that in the studied period, the painful symptomoatology appeared at 14% of sportsmen.

The distribution of patients in function of age is reproduced in the next table.

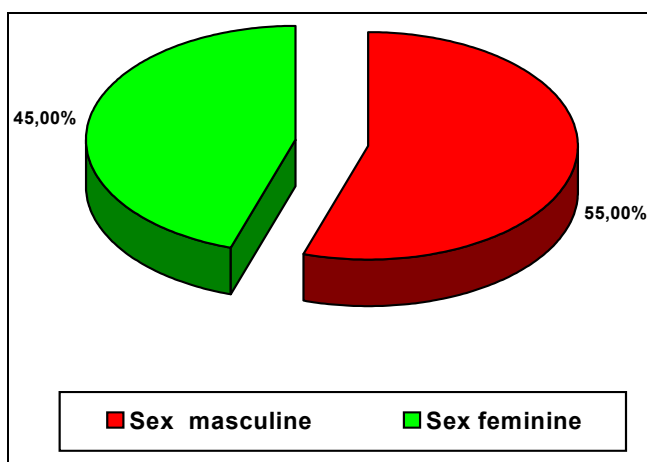
**Table 1.** - Age of studied cases

Age	Number cases	%
7 years	1	5
9 years	2	10
10 years	1	5
11 years	2	10
12 years	3	15
13 years	3	15
14 years	2	10
16 years	2	10
17 years	2	10
18 years	2	10

Repartition on sexes of cases from the analised lot which indicates values aproximatively equal.

**Table 2.** -Repartition on sexes

Sex	Number of cases	%
Masculine	11	55
Feminine	9	45
<b>Total</b>	<b>20</b>	<b>100</b>

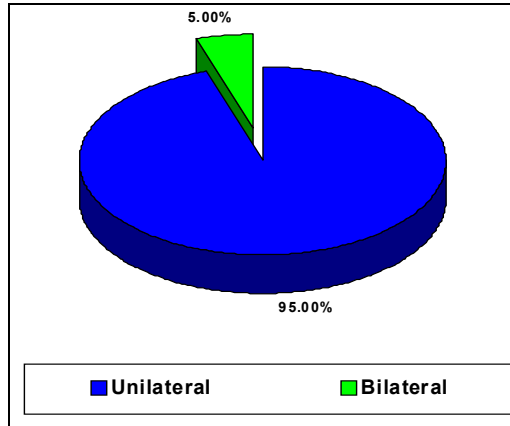


**Figure 1.** - Repartition on sexes of the studied lot

The affectionation of joint of the shoulder is dominant unilateral and şî correspond to the right shoulder for rightly, respectively to a left shoulder for the lefthanders.

**Table 3.** -The affectionation of the joint

The affectionation of joint	Number of cases	%
Unilateral	19	95
Bilateral	1	5
<b>Total</b>	<b>20</b>	<b>100</b>



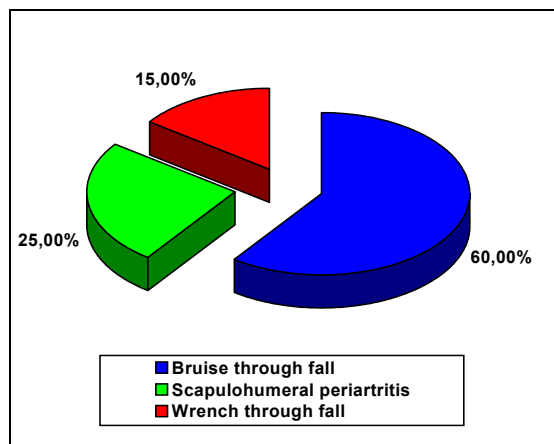
**Figure 2.** -The affection of the joint

It has been established next diagnostics:

- ✓ Bruise through fall – 12 cases;
- ✓ peri-arthritis scapulohumeral - 5 cases;
- ✓ wrench through fall - 3 cases.

**Table 4.** - Diagnostics

Diagnostics	Number of cases	%
Bruise through fall	12	60
Peri-arthritis scapulohumeral	5	25
Wrench through fall	3	15
<b>Total</b>	<b>20</b>	<b>100</b>



**Figure 3.** - Constant Diagnostics

## Results and discussions

For applying the techniques complementary of massage is necessary a very good control of the technique, but also the knowledge of the anatomy of the affected segment, from the point of view of the orientation of muscular fibers, or tendons, because the applyance of maneuvers is made ina strict way, well definided. Each orientation of the maneuvers of work determines a certain action on the visaed structures:

1. In the profound transverse massage the applyance of the, maneuvers is made strictly transverse on the muscular fibers, tendinouses sau tendons, and in orientation even oblique might limit the action on the visaed structures, involving in change other structures which we do not want to work. The effects of the technique are represented first by the locale hiperemy, assuring the elimiation of the substances algogenes. Because of the fact that the main maneuver used by the profound transverse massage is friction, another effect determined directly by this maneuver is tranquillizer-relaxing of the worked stuctures, respectively tendons, and muscles. The major effect,, is represented by the abolishment of the adherences from the posttraumatic sequelaes, which will not recover if the massage transverse profound will be followed by active mobilisations, contributing to the restoration of functionality of the affected segment.

2. In the conjunctive masage the applyance of maneuvers is made in log of structures mentioned above, and the used maneuveres differ by the ones applied in the case of massage transverse profound. The main maneuver is here the flattening with high pressure and applied only with the pulp of policel or of index and of medius, so at surface of contact very reduced. The areas of applyance of the maneuvers are the ones that present reflexes at the level of the conjunctive tissue of type of retracts, interpreted like broaded tape or like aligned orbs like „beads on the rope”, set off at he level of the skin. The major effect is the hiperemiant local, which not only that „washes” the area of the proinflamatory and algogenes substances, but also favours reorganisation of the conjunctive fibers. Another important is the reflex one, which act not only local, but also at distance, the modification itself being determined by the different request of some structures with the purpose of protectios of the affected area of trauma.

3. The reflex massage of the type ofreflexology presents meanings of work wellcoded, which depend by the reflex area of projection approached. The basics maneuvers are the associated digital pressure, in function of case, with the friction, the slide or the vibration. The concerned effects through reflexology, in the case of posttraumatic sequelaes, are the ones reffering to the removal of pain through stimulation of elimination of algogenes substances in the reflex way.

The appliance of the techniques complementary of massage in the treatment of posttraumatic sequelaes imposes the knowledge of the way of positioning of the patient, in such a way that he could display the concerned structures, sometimes even to put in tension (tendons) or to relax them(musculature). It



was noticed that the exclusive use of physio-physiotherapy extends the period of recovery in the case of posttraumatic sequelae, especially of the adherent ones, and the restitution of functionality is not complete, comparing with the programmes which include at least one of the complementary techniques of massage along with physiotherapy. This is due to the fact that not even the passive extension, not even the muscular contraction cannot remove the adhesions which embarrasses the free fall of fibers between them, even if they are muscular, tendinous or tendons.

The first step in „abolishment” of posttraumatic sequelae would be represented by the complex massage through complementary techniques, which can be mingled to reduce the painful phenomenon (criomassage, reflexology) and to increase the local circulation, which would emphasise the elimination of the active substance (pain substance), responsible of chronicisation of the local pain (the transverse profound massage, the conjunctive massage).

The effects are argued by the mingle of these techniques with the complementary electrotherapy represented by ultrasounds and electromagnetics emanations. We must take into account that in the case of posttraumatic sequelae exist a touch of the proprioceptive information and that during a global activity the subject avoids the request of affected structures, producing moving modified schemes which tend to last. Thus, the removal of the painful sequelae will prepare the reversion to a normal kinetic behaviour, this actually being the main purpose of progressive kinesiotherapy part from the programme of recovery of posttraumatic sequelae. The means that compose this programme can be made only together, by summing the effects of each one, the functional reharmonization, through averting of primary disturbed afferents.

Through the way of appliance and the modifications of the clinic tableau appeared during the application, the complementary techniques of massage can signalise the presence of a serious masked injury, which can benefit of a correct treatment after a new medical evaluation. For example, a pain that does not stop to increase during the massage session represents a signal to stop until a new medical evaluation.

After the treatment, the evolution was favorable in all 20 cases, occurring the complete healing. At the diagnostics of bruise and scapulohumerous peri-arthritis, the healing was produced in maximum 2 weeks, and in all 3 cases of wrench, in the most 30 days.

## **Conclusions**

1. The complementary techniques of massage are indispensable in the treatment of posttraumatic sequelae, for restoration of the functionality of the affected segment. The major indication is at the patients to whom is desired a recovery complete and in a short period of time.

2. The law value of the muscular force of the scapular belt favours the appearance of this pathology at the sportsmen who practice repeated activities in the joint of the shoulder.

3. The painful shoulder at the table tennis players appear dominant unilateral.

4. The biggest incidence was made by trauma bruise, the fall on the affected shoulder in percent of 60%.

5. The practiced techniques (the profound transverse massage; the conjunctive massage; criomassage; the reflex massage of type of reflexology) had following good results:

- the combatation of the pain and of the inflammation;
- the combatation of articular restoration;
- the redo of the articular mobility;
- the redo of flexibility and of muscular force;
- the gestuous recovery of the articulation of the shoulder.

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## L'ÉDUCATION INCLUSIVE

**DORINA MARIANA OLTEANU<sup>1</sup>, IRINA LUMINIȚA ERIMIA<sup>1</sup>**

**SOMMAIRE.** Mon article se concentre sur le thème de l'intégration sociale et professionnelle des enfants avec c.e.s. La participation des enseignants est la condition majeure dans la réalisation de l'intégration des enfants à besoins spécifiques dans la vie scolaire et sociale. Ainsi, l'éducation inclusive devient la méthode éducative qui est responsable de garantir le droit à l'éducation pour tous les enfants, sans discrimination et, en particulier, la garantie d'une éducation de qualité. La présence, dans la classe, des enfants nécessitent des efforts accrus de l'enseignant dans tous les aspects: la préparation des leçons, les activités parascolaires, les attitudes envers l'enseignement de tous les élèves de la classe. L'enseignant doit fournir à l'enfant / élève ayant des besoins éducatifs un traitement individuel à toutes les étapes de la leçon, pour qu'il puisse rattraper les lacunes, de capitaliser sur son potentiel de façon compensatoire, mais en ne négligeant pas les autres élèves de la classe. L'éducation inclusive permettra aux enfants avec C.É.S. de vivre en famille, apprendre dans une classe avec des enfants valides, d'acquérir les compétences nécessaires pour mener une vie normale.

**Mots-clés :** enfants à besoins spécifiques, activités parascolaires, éducation inclusive

**REZUMAT. *Educația Incluzivă.*** Articolul abordează tema privitoare la integrarea socio-profesională a copiilor cu c.e.s. Implicarea cadrelor didactice este condiția majoră în realizarea integrării copiilor cu dizabilități în viața școlară și socială. Educația incluzivă devine tipul de educație responsabil de asigurarea dreptului la educație a tuturor copiilor, fără nicio discriminare și, mai ales, de asigurarea unei educații de calitate. Prezența unor astfel de copii în colectivul clasei soliciță efort crescut din partea dascălului sub toate aspectele : pregătirea pentru lecții, pentru activități extrașcolare, atitudinea față de toți elevii clasei. Cadru didactic trebuie să ofere elevului cu c.e.s. tratarea individuală de care are nevoie în toate etapele lecției, pentru ca acesta să recupereze neajunsurile, să valorifice în mod compensatoriu potențialul sănătos, să nu negligeze ceilalți elevi ai clasei. Educația incluzivă va permite copilului cu c.e.s. să trăiască în familie, să învețe într-o clasă cu copii valizi, să dobândească abilități indispensabile unei vieți normale.

**Cuvinte cheie:** copii cu nevoi specifice, activități extrașcolare, educație incluzivă.

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*Nous vivons tous sous le même ciel, mais  
nous n'avons pas tous le même horizon.*  
(Konrad Adenauer)

L'éducation est un droit humain fondamental (tous les enfants devraient avoir le droit à une éducation de qualité gratuite), ce qui permet à chacun d'acquérir les connaissances nécessaires pour comprendre le monde d'aujourd'hui et de participer activement. L'éducation contribue à garder les valeurs, est un pilier de l'apprentissage continu, donne confiance en soi même, rend l'individu plus indépendant et également plus conscient de ses droits et de ses capacités.

L'éducation enseigne à une personne comment se comporter en citoyen responsable et éclairé.

L'éducation inclusive (intégrée) est apparue et s'est développée dans les dernières décennies comme un principe fonctionnel tant au niveau des politiques éducatives que au niveau des pratiques éducatives développées à l'école, au sein de la famille et dans la société.

L'éducation inclusive est fondée sur plusieurs principes clés:

- Chaque élève a un droit inhérent à l'éducation sur l'égalité des chances;
- Aucun élève ne peut être exclu de l'éducation ou de l'objet de discrimination fondée sur la race, la religion, la couleur, le sexe, la langue, l'origine ethnique, le handicap,
- Tous les élèves peuvent apprendre et bénéficier de l'éducation;
- L'école s'adapte aux besoins des élèves, les étudiants ne s'adaptent pas aux besoins de l'école;
- Différences individuelles entre les élèves sont une source de richesse et de diversité, pas un problème.

L'éducation inclusive est apparue en réponse aux carences de l'éducation intégrée, qui n'a pas réussi à empêcher la marginalisation des enfants différents de la «norme» générale de la population scolaire. Cette méthode d'éducation est définie comme suit:

- appuie et confirme que tous les enfants peuvent apprendre et ont besoin d'une certaine forme de soutien à l'apprentissage;
- vise à identifier et à réduire les obstacles liés à l'apprentissage;
- est plus complète que l'éducation formelle habituelle, notamment: l'éducation au sein de la famille, de la communauté, d'autres possibilités de formation en dehors de l'école;
- nécessite des changements dans les attitudes, les comportements, les programmes afin de répondre à des enfants différents, également pour ceux ayant des besoins éducatifs;
- est un processus dynamique qui se développe en permanence en fonction de la culture et du contexte;
- fait partie d'une stratégie visant à développer une société inclusive.

Ainsi, l'éducation inclusive devient la méthode éducative qui est responsable de garantir le droit à l'éducation pour tous les enfants, sans discrimination et, en particulier, la garantie d'une éducation de qualité.

La réalisation de cet enseignement comprend:

1. l'existence et l'application de principes d'intégration: le principe de l'égalité des droits, la non-discrimination, l'égalité des chances en matière d'éducation centrées sur les enfants, l'intervention précoce, le principe de l'éducation de base pour tous les enfants, en assurant des services de soutien, de coopération et de partenariat;

2. mise en œuvre de la pédagogie inclusive qui inclue parmi ses attribues d'être: pédocentriste, progressive, personnalisée, optimiste, sociale,

3. élaborer un programme «inclusive» pour définir la flexibilité et la diversité: programme adapté aux besoins de l'enfant, la diversité dans l'évaluation: les formes, les méthodes, les outils;

4. la création et le fonctionnement d'un système de services de soutien à tous les niveaux de l'éducation.

Ainsi, l'éducation inclusive est un processus constant d'amélioration des écoles, de l'exploitation visant des ressources existantes, en particulier les ressources humaines.

L'école et la famille sont les deux piliers importants de l'éducation. Entre eux et la communauté, l'école et l'environnement extra-familial, évolue l'enfant, objet et sujet de l'éducation. Si ces environnements éducatifs se complètent et se soutient, ils fournissent une meilleure intégration de l'enfant à l'école et plus largement, une meilleure intégration sociale.

L'école doit avoir des contacts avec tous les organismes sociaux intéressés directement ou partiellement par l'éducation des enfants d'âge scolaire et doit établir des relations de coopération et de collaboration. Elle contribue ainsi à la transmission du patrimoine culturel et facilite l'apprentissage individuel et collectif.

L'école permet aussi la participation à la vie publique des groupes et des communautés, le développement et la prise de décisions. Favorise l'échange d'informations et l'interaction sociale, permet à un grand nombre de personnes de prendre une part active à la résolution des problèmes qui les concernent. L'activité éducationnelle inclusive dans les écoles est réussie si les trois facteurs, à savoir, l'étudiant ayant un handicap, la famille et l'équipe de spécialistes coopèrent, sont des partenaires qui travaillent ensemble pour attendre la même objectif: le développement des enfants ayant des besoins éducatifs. Chacun des partenaires a des responsabilités claires quant à l'acte éducatif, qui, cependant, ne fonctionne pas correctement à moins que les actions des autres membres de l'équipe soient synchronisées.

Nous essayons de présenter, de façon aussi concise que possible, les conséquences de l'implication de chaque partenaire dans l'éducation des enfants ayant des besoins éducatifs dans un système intégré.

### **I. Conséquences pour les étudiants**

L'intégration des enfants ayant des besoins spéciaux individuels dans les classes ordinaires implique les conséquences suivantes. :

- a) l'enfant reste dans sa famille, avec le soutien moral et affectif sans condition;
- b) l'adaptation des programmes et des ressources procédurales et organisationnelles à ses besoins;
- c) apprendre dans des classes homogènes;
- d) accroître la motivation à l'apprentissage, car il est entraîné par l'environnement concurrentiel et la performance scolaire des pairs non handicapés;
- e) diminue l'isolement de l'enfant handicapé et augmente le niveau d'un contact régulier avec les enfants, l'augmentation du niveau de la socialisation;
- f) les enfants valides, à la suite de contact avec les enfants / élèves ayant des besoins spéciaux, vous l'aurez compris, vont l'accepter et leur attitude déterminera l'apparition d'un sentiment protecteur, même dans les groupes normaux.

### **II. Implications pour les parents**

Nous partons du constat que les parents sont les facteurs de soutien les plus importants aussi bien chez les enfants handicapés que chez les enfants en bonne santé. La vie de famille (ou au moins l'un des parents) s'adaptera au programme des enfants avec un handicap sévère ou modéré. Afin d'être en mesure de soutenir les enfants dans le besoin, les parents doivent participer aux actions suivantes, réalisées par l'équipe d'intervention:

- Des conseils sur le diagnostic et les conséquences sur l'enfant, en tenant compte de l'évolution de ses déficiences prévisible et la mise en place des actions compensatoires;
- Informations sur le potentiel réel de l'enfant et les moyens susceptibles de favoriser son développement;
- Des informations sur les types de services qui peuvent fournir la meilleure éducation et le développement des enfants ayant des besoins spéciaux.

La coopération de l'équipe d'intervention familiale peut transformer un parent dans un bon "spécialiste", ce qui crée un environnement d'éducation inclusive, généré par:

- mise en place de relations positives entre parents - enfants - enfant déficient, ce qui élimine les réactions typiques comme la dépression, la colère, la culpabilité, le sentiment d'injustice, l'anxiété, l'apitoiement sur soi, le rejet de l'enfant ou sa surprotection qui empêche le développement de l'autonomie des enfants pour des besoins particuliers;

- convaincre les parents qu'ils ne sont pas seuls dans leurs efforts d'éducation pour leurs enfants déficients;
- apprendre à la famille à vivre en harmonie avec les enfants ayant des besoins spéciaux;
- acquérir des compétences techniques et spéciales pour les enfants handicapés, en collaboration avec les professionnels du domaine;
- développer des programmes éducatifs en collaboration avec l'équipe transdisciplinaire.

L'instauration d'un environnement propice au potentiel de développement des enfants handicapés nécessite de la part des parents les indications suivantes:

- l'acceptation de la réalité;
- une attention particulière aux enfants handicapés et une meilleure compréhension de leurs besoins;
- disponibilité physique et psychologique dans le temps;
- confiance dans les facteurs qui peuvent contribuer au développement des enfants (médecin, kinésithérapeute, psychologue, orthophoniste, enseignant);
- de l'affection et de la patience.

### **III. Implications des enseignants**

Dans la salle de classe comportant des étudiants handicapés, nous acceptons la diversité en tant que valeur. Pour valoriser réellement le potentiel de chaque enfant à besoins éducatifs particuliers nous devons reformuler toutes les composantes éducatives:

- objectifs / buts;
- curriculum;
- ressources procédurales, matérielles, organisationnelles;
- évaluation;
- une relation entre les partenaires de l'éducation;
- ressources humaines

La participation des enseignants est la condition majeure dans la réalisation de l'intégration des enfants à besoins spécifiques dans la vie scolaire et sociale. Pour cette approche en classe, afin de faciliter l'intégration rapide des enfants ayant des besoins spéciaux, nous avons exploité leur sensibilité particulière ainsi que la volonté de donner et de recevoir de l'affection des autres. Nous abordons l'enfant avec C.É.S. avec confiance et la volonté de faire le maximum pour l'aider. Dans ces conditions seront acceptés les critiques, même réconforter, afin de corriger et de ne pas l'isoler.

Un autre aspect à prendre en compte est de les traiter à égalité avec les autres enfants autant que possible. Quelle que soit l'activité nous ne devons pas dire à un enfant ayant des besoins éducatifs "Vous ne pouvez pas assister ...." (visites, tournées, festivals, etc.) Au lieu de cela, nous allons les encourager à agir



en raison de besoins particuliers, cependant, en lui réduisant l'activité. A ce stade nous devons l'aider.

La présence, dans la classe, des enfants nécessitent des efforts accrus de l'enseignant dans tous les aspects: la préparation des leçons, les activités parascolaires, les attitudes envers l'enseignement de tous les élèves de la classe. L'enseignant doit fournir à l'enfant / élève ayant des besoins éducatifs un traitement individuel à toutes les étapes de la leçon, pour qu'il puisse rattraper les lacunes, de capitaliser sur son potentiel de façon compensatoire, mais en ne négligeant pas les autres élèves de la classe. L'intervention éducative doit être accompagnée par l'attitude positive des enseignants envers les enfants et les familles avec des besoins éducatifs spéciaux.

L'éducation inclusive permettra aux enfants avec C.É.S. de vivre en famille, apprendre dans une classe avec des enfants valides, d'acquérir les compétences nécessaires pour mener une vie normale avec les possibilités dont il dispose et le potentiel qu'il se développe dans un environnement équilibré.

L'éducation spéciale et la psychosociologie, en particulier la recherche d'action, favoriseront le principe de normalisation, si l'on applique le principe de l'intervention précoce efficace et de l'éducation inclusive. L'intégration scolaire comme une situation de socialisation, peut également être définie de deux façons:

- Au sens large, reflète l'adaptation de tout enfant aux exigences scolaires;
- Au sens étroit, dans le cadre de la normalisation, les questions liées aux enfants ayant des besoins spéciaux reflètent leur inscription dans des écoles normales ou dans des structures similaires.

L'école et la famille en tant qu'agents de socialisation, ont un rôle très important dans l'intégration des enfants handicapés dans l'enseignement pour tous. Donc, suite à la décision que l'enfant sera inscrit dans une structure d'enseignement normale, il faut prendre des mesures afin de favoriser son intégration réelle.

Actuellement, la Roumanie est l'objet d'une tentative de redéfinition du rôle social de l'enseignement dans le cadre d'un « partenariat pour l'éducation », ouverte, lucide, responsable, entre tous les facteurs éducatifs (famille, église, école, collectivité locale). L'école ouvre à l'environnement communautaire et fait des propositions pour réaliser l'osmose école-communauté (communauté scolaire et communauté à l'école) dans la perspective d'un centre culturel et civique, complexe, afin de favoriser l'apprentissage pour tous, jeunes et moins jeunes. Par des programmes et des actions spécifiques afin de créer des liens multifonctionnels et de développer la société civile.

Il est très important qu'un enfant handicapé devienne le plus autonome possible dans toutes les actions qu'il entreprend. Cependant, toutes les actions et les stratégies de mise en œuvre de l'éducation intégratrice dans l'actuel système d'enseignement doivent commencer à partir d'une analyse, à la fois, macrosociale et microsociale. L'analyse microsociale prend en compte:

- la disponibilité et l'intérêt des enseignants pour soutenir l'éducation intégrée à travers des activités de classe avec l'effectif dont ils ont la charge;
- l'accord des parents d'enfants dans des classes qui pratiquent l'intégration – cela afin d'éviter les tensions ou les conflits qui peuvent surgir ultérieurement;
- la structure actuelle des classes (nombre) dans l'enseignement ordinaire permet-elle l'intégration?;
- l'enseignant peut-il gérer une approche différenciée pour les différentes catégories d'enfants en classe?;

Cependant, tout éducateur qui se concentre sur son travail à l'enfant ne doit pas oublier que:

- Chaque enfant est important pour la société;
- Chaque enfant a des besoins spécifiques;
- Chaque enfant a des aptitudes spécifiques;
- Chaque enfant est unique;
- Même si ils sont différents, tous les enfants sont égaux en droits.

La normalisation sociétale représente le plus haut niveau d'acceptation sociale. Elle fait de l'initiative de valorisation du potentiel de chacun individu une pratique courante, ordinaire, qui n'a plus rien d'extraordinaire ou d'inhabituel. L'écrasante majorité des membres d'une société avec une mentalité a évolué considérablement, considère que les différences normales entre les individus sont sources pour de nouvelles expériences de vie et apportent des bénéfices à la société. Une personne ayant des besoins spéciaux, présente dans une communauté, peut s'exprimer en tant que citoyen, en tant que producteur de biens et de valeurs, en tant que personne. Même un enfant ayant des déficiences multiples peut trouver sa place dans ce genre d'organisation sociale et peut apprendre les moyens pour répondre à ses aspirations, au moins en partie. La normalisation de la société fait que les différents handicaps deviennent sans importance. En se concentrant sur ce que peut apporter la personne ayant des besoins particuliers, l'accent est mis sur la valeur apportée et non pas sur ce qu'elle ne peut pas apporter.

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