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## PHISICAL EDUCATION AND SPORT MANAGEMENT
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# SUMMARY

# STUDY REGARDING THE ROLE OF MENTAL EXERCISES, PHYSICAL EXERCISES, AND VIDEO DEMONSTRATION IN LEARNING HURDLING TECHNIQUES, IN THE STUDENTS OF THE FACULTY OF MOVEMENT, SPORTS, AND HEALTH SCIENCES, THE "VASILE ALECSANDRI" UNIVERSITY OF BACĂU

**Professor Cătălina Ababei, PhD.**
**Professor Radu Ababei, PhD.**
"Vasile Alecsandri" University of Bacău

***Abstract:*** *No great performance can be made without a precise knowledge of the tasks. The strategy divided for the Faculty of Movement, Sports, and Health Sciences first year students to learn hurdling, had a multilevel structure, formed of training methods, training means, forms of organization and instructional decisions, for which the final result was determined by their synthesis and interaction.*

**Introduction**

The concept of teaching, according to the great Romanian pedagogue Ioan Cerghit, represents "a complex ensemble of specific didactic actions and behaviors that are destined for producing learning" (Cergit, I,1998). In other words, teaching is a provoked change of what it is, in what it should be.

Hurdling is a technical event that presupposes a delicate combination of suppleness and movement coordination within an effective technique, by the runner, for crossing over the hurdle. Besides that, hurdling demands good and very good results in the 100 m flat event (for the 110 m hurdles male runners, and for the 100 m hurdles female runners, respectively). Generally speaking, the hurdling technique must offer the athlete the possibility for him/her to fully capitalize his/her moving speed.

For this reason, the technique, for the specialists, represents the time difference between a run without hurdles and a run with hurdles. The smaller this coefficient is, the higher the technique.

Considering we are dealing with students with a reduced number of hours for learning how to jump the hurdle, we believe that in this case the quality of the act of teaching becomes primordial. The way in which we succeed in transmitting to the students information on the technical aspects of this event, the way in which we communicate with them in order to record a progress of their cognitive, emotional, and motor experience, to inspire trust in them, to motivate them in attaining their goal as fast as possible, this we believe it constitutes the key to success in understanding first of all the essence of hurdling technique, and after that, applying it in practice.

**Research Aim and Hypothesis**

Numerous specialists wrote about the relation between mental functions and motor activity (Halpert, 1993, Johnson, 1982). There are also several studies concerning the importance of mental exercises and video demonstration in perfecting the motor habits (Dempsez, 1969, Denis, 1965).

This research aimed to follow the way in which the communication methods facilitate the learning of hurdling technique, in the Faculty of Movement, Sports, and Health Sciences first year students, at the "Vasile Alecsandri" University of Bacău. In other words, the aim was to verify the effects of mental practice and video demonstration, together with physical exercise, and continuous practice, within the motor learning.

Taking into account our aim, we starting from the following **hypothesis**:

*The introduction of video demonstration, and reserving a short period of time for a mental representation of performing the jump over the hurdle, during the classes prepared for this theme, would lead to positive modifications in the motor behavior, in a large number of students.*

The research methods we used throughout this research were: the study of the specialized literature, the experiment method, and the statistical-mathematical method, for analyzing the data.

**Conducting the research**

The study was conducted in the second semester of the academic year 2010-2011, in March and April, 2011, during the 6 hours allocated for teaching the hurdling technique, according to the syllabus for the class Theoretical and methodical bases of athletics, comprised in the faculty curriculum as a fundamental, mandatory discipline, with 2 hours of teaching and 2 hours of practical workshops per week.

The study comprised 75 first year students of the Faculty of Movement, Sports, and Health Sciences, specializations Physical and Sportive Education/ Sports and motor performance, out of which 53 were boys, and 22 were girls. In the data analysis process we took into consideration only the students who were not absent from any class during that period of time: 38 students, 22 boys,

and 16 girls. Half of these constituted the witness group (11 B, 8 F), and half the experimental group (12 B, 7F.).

The lessons were conducted in the athletics hall, with a circular track, at the Bacau Sportive Complex. This allowed us to install video devices, and allowed the students in the experimental group to view 5 minutes, before each lesson, videos of 100 m and 110 m hurdles races, from the site http://www.youtube.com. After each view, the experimental group students also had another 5 minutes to represent in their mind two 50 m hurdles races, with an individual (manual) timing of the race.

The physical exercise program we conceived for teaching the hurdling technique was identical for both groups.

In this research we conducted two assessments for the 50 m hurdles distance (G and B), one at the beginning of the course, and one at the end, and for two 50 m flat races, also one at the beginning, and one at the end of the unit.

Taking into consideration the level of training of the students, as well as the difficulty of the hurdling technique, the distances between hurdles, and their height, for both groups, were according to the Romanian Athletics Federation regulations for the children I hurdles events. Thus, the running distance had a number of 5 (five) hurdles, with a height of 0.762 m (M/F), with a distance of 7.20 m (F), and 8.00 m (M) between them. The distance from the start line to the first hurdle was of 12.00 m (F/M). In this way we tried to avoid possible injuries, and we tried to make the hurdles easier to cross over, with a rhythm of 3 steps between them.

The start was crouched, on command, both in the flat race, and in the hurdles race.

The timing of the races was done with the ALGE TIMER devices, existent in the athletics hall, bought by the *Bacau County Direction for Youth and Sports*, and it aimed to emphasize the differences recorded by the subjects in the flat race, and the hurdles race, at the beginning, and at the end of the experiment.

**Results**

We present in the following tables the initial results obtained by the subjects in the witness and experimental groups. In Table 1 we see the initial results, the final results, the progress recorded after the 2 tests, and the arithmetical means of the results obtained by the students in the witness group during the 50 m flat races.

*Table 1*

| No. | Name | M/F | Initial Results 50m.f (sec) | Final Results 50m.f (sec) | Progress 50m.f (sec) |
|---|---|---|---|---|---|
| 1. | A.D.A | M | 6.77 | 6.70 | 0.07 |
| 2. | A.G.A. | M | 6.51 | 6.49 | 0.03 |
| 3. | B.A. | M | 6.92 | 6.95 | +0.03 |
| 4. | B.E. | M | 6.70 | 6.68 | 0.02 |
| 5. | B.S. | M | 6.55 | 6.49 | 0.06 |
| 6. | C.S. | F | 8.02 | 7.88 | 0.14 |
| 7. | C.L. | F | 7.80 | 7.83 | +0.03 |
| 8. | F.M. | F | 8.10 | 8.12 | +0.02 |
| 9. | G.A. | F | 7.83 | 7.77 | 0.06 |
| 10. | G.A.G. | F | 9.03 | 8.85 | 0.18 |
| 11. | H.L. | M | 7.75 | 7.68 | 0.07 |
| 12. | H.M.E. | F | 7.72 | 7.66 | 0.06 |
| 13. | L.T. | F | 7.35 | 7.29 | 0.06 |
| 14. | M.V.D. | M | 6.70 | 6.72 | +0.02 |
| 15. | M.L. | F | 8.22 | 8.00 | 0.22 |
| 16. | M.V. | M | 6.59 | 6.57 | 0.02 |
| 17. | M.R.I. | M | 6.86 | 6.89 | 0.03 |
| 18. | M.V. | M | 6.95 | 6.88 | 0.07 |
| 19. | M.I. | M | 6.89 | 6.80 | 0.09 |
| | Arithmetical mean | | 7.69 | 7.43 | |

In Table 1 we see the initial results, the final results, the progress recorded after the 2 tests, and the arithmetical means of the results obtained by the students in the witness group during the 50 m hurdles races.

*Table 2*

| No. | Name | M/F | Initial Results 50m.h (sec) | Final Results 50m.h. (sec) | Progress 50m.h. (sec) |
|---|---|---|---|---|---|
| 1. | A.D.A | M | 9.97 | 9.70 | 0.27 |
| 2. | A.G.A. | M | 10.42 | 9.79 | 0.63 |
| 3. | B.A. | M | 10.92 | 10.45 | 0.47 |
| 4. | B.E. | M | 9.90 | 9.68 | 0.22 |
| 5. | B.S. | M | 10.35 | 9.69 | 0.66 |
| 6. | C.S. | F | 12.02 | 11.38 | 0.64 |
| 7. | C.L. | F | 11.5 | 11.13 | 0.37 |
| 8. | F.M. | F | 11.4 | 11.12 | 0.28 |
| 9. | G.A. | F | 11.93 | 11.47 | 0.46 |
| 10. | G.A.G. | F | 13.43 | 12.75 | 0.68 |
| 11. | H.L. | M | 12.25 | 11.78 | 0.47 |
| 12. | H.M.E. | F | 11.62 | 11.46 | 0.16 |
| 13. | L.T. | F | 11.15 | 10.69 | 0.46 |
| 14. | M.V.D. | M | 10.70 | 10.22 | 0.48 |
| 15. | M.L. | F | 12.72 | 12.00 | 0.72 |
| 16. | M.V. | M | 10.29 | 9.77 | 0.52 |
| 17. | M.R.I. | M | 10.86 | 10.19 | 0.67 |
| 18. | M.V. | M | 10.85 | 10.38 | 0.47 |
| 19. | M.I. | M | 11.09 | 10.50 | 0.59 |
| | Arithmetical mean | | 11.23 | 10.74 | 0.48 |

In Table 3 we see the initial results, the final results, the progress recorded after the 2 tests, and the arithmetical means of the results obtained by the students in the experimental group during the 50 m flat races.

*Table 3*

| No. | Name | M/F | Initial Results 50m.f (sec) | Final Results 50m.f (sec) | Progress 50m.f (sec) |
|---|---|---|---|---|---|
| 1. | P.A. | F | 7.92 | 7.87 | 0.05 |
| 2. | P.P. | M | 6.87 | 6.77 | 0.10 |
| 3. | P.A. | M | 7.05 | 7.12 | +0.07 |
| 4. | P.D. | F | 7.74 | 7.76 | +0.02 |
| 5. | P.G. | M | 7.02 | 6.92 | 0.10 |
| 6. | R.R. | F | 7.87 | 7.80 | 0.07 |
| 7. | S.D. | F | 7.25 | 7.15 | 0.10 |
| 8. | V.O. | F | 7.89 | 7.90 | +0.01 |
| 9. | B.L. | M | 6.60 | 6.53 | 0.07 |
| 10. | C.L. | F | 7.97 | 7.90 | 0.07 |
| 11. | F.A. | F | 8.05 | 7.88 | 0.17 |
| 12. | I.F. | M | 7.00 | 7.12 | +0.12 |
| 13. | I.A. | M | 6.87 | 6.82 | 0.05 |
| 14. | L.T. | M | 6.71 | 6.69 | 0.03 |
| 15. | M.A.G. | M | 7.21 | 7.15 | 0.06 |
| 16. | P.E. | M | 7.35 | 7.17 | 0.18 |
| 17. | S.I. | M | 6.42 | 6.40 | 0.02 |
| 18. | V.M. | F | 7.62 | 7.54 | 0.08 |
| 19. | R.V. | M | 6.79 | 6.73 | 0.06 |
| | Arithmetical mean | | 7.27 | 7.38 | |

In Table 4 we see the initial results, the final results, the progress recorded after the 2 tests, and the arithmetical means of the results obtained by the students in the experimental group during the 50 m hurdles races.

*Table 4*

| No. | Name | M/F | Initial Results 50m.h (sec) | Final Results 50m.h (sec) | Progress 50m.h. (sec) |
|---|---|---|---|---|---|
| 1. | P.A. | F | 12.22 | 11.37 | 0.85 |
| 2. | P.P. | M | 10.77 | 9.77 | 1 |
| 3. | P.A. | M | 11.05 | 10.2 | 0.85 |
| 4. | P.D. | F | 11.54 | 10.96 | 0.44 |
| 5. | P.G. | M | 11.22 | 10.32 | 0.9 |
| 6. | R.R. | F | 11.67 | 10.70 | 0.97 |
| 7. | S.D. | F | 10.25 | 9.45 | 0.8 |
| 8. | V.O. | F | 12.29 | 11.3 | 0.99 |
| 9. | B.L. | M | 9.90 | 9.23 | 0.67 |
| 10. | C.L. | F | 12.17 | 11.40 | 0.77 |
| 11. | F.A. | F | 12.65 | 11.28 | 1.32 |
| 12. | I.F. | M | 11.10 | 10.62 | 0.48 |
| 13. | I.A. | M | 10.77 | 9.92 | 0.85 |
| 14. | L.T. | M | 10.41 | 9.69 | 0.72 |
| 15. | M.A.G. | M | 11.51 | 10.95 | 0.56 |
| 16. | P.E. | M | 11.85 | 10.97 | 0.88 |
| 17. | S.I. | M | 9.52 | 8.90 | 0.62 |
| 18. | V.M. | F | 11.72 | 10.64 | 1.08 |
| 19. | R.V. | M | 10.59 | 9.93 | 0.66 |
| | Arithmetical mean | | 11.23 | 10.40 | 0.83 |

From the centralized data we can observe that after the initial tests for the 50 m flat event, with a crouching start, the witness group students recorded results between 6.51 s and 9.03 s, with an average of 7.69 s, while the experimental group recorded results between 6.42 s and 8.05 s, with an average of 7.27 s.

In the 50 m hurdles event, the witness group students recorded results between 9.90 s and 13.43 s (with an average of 11.23 s), during the initial testing, while the experimental group recorded results between 9.52 s and 12.17 s (their average being the same as for the witness group, 11.23 s!).

In the final testing, the witness group recorded results comprised between 6.49 s and 8.85 s, with an average of 7.43 s, in the 50 m flat race, while the experimental group had results comprised between 6.40 s and 7.90 s, with an average of 7.38 s.

In the 50 m hurdles event, the witness group students recorded results between 9.68 s and 12.75 s (with an average of 10.74 s), during the initial testing, while the experimental group recorded results between 8.90 s and 11.40 s (their average being this time 10.40 s).

**Conclusions**

The research did not confirm our hypothesis, in the sense that the use of video demonstration and mental exercises in the experimental group at the beginning of the lessons allocated for teaching hurdling technique, did not lead to any modifications in the motor behavior, as we wanted, of a larger number of students, in comparison with the witness group. It is interesting to notice that in both groups, all of the students caught in the study obtained superior results in the final testing for the 50 m hurdles event. What differentiates the experimental group from the witness group is the value of the individual progress, comprised between 0.53 s, and 1.32 s, in comparison with the individual progress of the witness group students, comprised between 0.27 sand 0.72 s. The results allow us to say that physical exercise (practice) has contributed to the quantitative aspect in learning the hurdling technique, while the mental exercise and video demonstration have contributed to the qualitative aspect of jumping over the hurdle.

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***Résuémé:*** *Aucune grande performance ne peut être faite sans une connaissance précise des tâches. La stratégie divisé pour la Faculté de mouvement, Sports, et les étudiants de première année Sciences de la santé pour apprendre les haies, avait une structure multiniveau, formée de méthodes de formation, des moyens de formation, des formes d'organisation et de décisions d'enseignement, pour lesquels le résultat final a été déterminé par leur synthèse et leur interaction.*

# STUDY REGARDING THE DEVELOPMENT OF ATHLETICS AND FOOTBALL IN THE FIRST HALF OF THE 20TH CENTURY IN BACAU

**Professor Radu Ababei, PhD.**
**Professor Cătălina Ababei, PhD.**
University "Vasile Alecsandri" of Bacău

***Abstract:*** *Similar to the models in the entire western world, the "cult" of physical exercises appeared in the urban environment of the Old Kingdom through sportive societies formed of pupils or students, but also through teams formed in different military units. In the case of pupils, the encouragement came through legislation, at the end of the 19th century, by introducing gymnastics classes in the middle-school and high-school curricula.*
*In the interbellum, the physical education and sports in Bacău experienced a high upstart, the period of maximum development being between the years 1934 - 1939, a time unmarked by crisis or war preparations.*
***Keywords:*** *history, sport, Bacău, Romania.*

Similar to the models in the entire western world, the "cult" of physical exercises appeared in the urban environment of the Old Kingdom through sportive societies formed of pupils or students, but also through teams formed in different military units. In the case of pupils, the encouragement came through legislation, at the end of the 19th century, by introducing gymnastics classes in the middle-school and high-school curricula.

The athletic competitions with spectators became a mainstream event in Bacău only in the period between the two world wars, once the number of sportive associations and clubs has grown. Among them, the Sports Club "Tinerimea" ("The Youth") distinguishes itself as being one of the first associations founded in Bacău, lead by Dionisie Ionescu.

Among the most dynamic athletic associations in Bacău was "Principele Mihaiu" ("Prince Michael"), founded in May 1925, bearing the name of the future King Mihai (Michael) I.

At the beginning of the 20th century, in Bacău, the people practiced: rugby, tennis, volleyball, basketball, gymnastics, football (soccer), and cycling, at which we can add, as far as the rich population was concerned, motoring.

**Track and Field Athletics**

Track and field athletics appeared late in an organized *form* in Bacau, in 1930. The first record of athletic competitions for this year is found in the weekly newspaper "Bacaul", on September 1. In one of its four pages, in the column "Culture... research... sports", we found:

*"The 'Mihai Eminescu' cultural society, with its sports section 'Unirea' organizes for the date of August 31, this year, 2 P.M., a great celebration in Bistrita Park. Among others, ... there are scheduled races over short distances, and endurance races...".*

On 22, the same month, "Bacaul" signaled the "10th Cavalry Regiment Jubilee - the arrival of His Majesty the King in our city".

*"The afternoon program will comprise the hurdles event with the recalled men for active duty, the officers' event, pole vaults, and various exercises performed by Colonel Madancovici".*

Used in military training, but also outside it, athletic competitions are enjoying high praise within the Bacau military circles, being present in most of the military celebrations in Bacau, and in the other cities of the county.

The throwing exercises are present in the training of young pre-military men and soldiers, throwing and launching different explosive devices at a distance, while the races and jumps of different types are part of their training, the soldiers being made to outrun certain obstacles, to quickly go across battle surfaces, and to march over long distances, which requires a specific endurance.

A very important event for the Bacau sports, with important connotations for athletics was the "Sportive Celebration in the CFR Park". Organized and conducted on August 16, 1932, it enjoyed great attention from the local sports public, and also from the Bacau's select circles. Together with the demonstrations offered by the practitioners of various local sports, back then organized within the component "sections" of different clubs and societies, military, cultural, or athletic, we find also a demonstration of six track and field events, conducted "in the spirit of emulation".

The presence of town officials and the bourgeois representatives of that time (most of them Jewish) did not have a direct influence on the future development of the Bacau sports.

Athletics, as the other sports, did not benefit from a serious organization, and a well deserved attention for the spectacle it offers. It remained the occupation of a few enthusiasts in love with physical exercise, many of them being practitioners of various sports. It may be that the only institution that supported it was the army, through officers such as: lt.Ghermănescu, lt. Buby Andrei, cpt. Bianchi, slt. Profiriu, col. Constantinescu.

Another event that marked the evolution of local athletics was the fusion between the "Prince Mihaiu/Michael Society" and the "Stadiul Bacauan" Sportive Association, an event that resulted in the construction of a modern sportive base, "the most complete of all there are in Moldavia, Bucovina, and

Bassarabia". From the local newspaper "Bacaul" (September 7, 1933) we find out that the newly formed society "had 6-8 well organized sections", and that "the athletics section will be lead by Professor Gheorghiu".

In 1936, the town of Bacau was enjoying the presence of the great marching champion Roze Rădulescu. He organized for the first time in the Moldavian province a 100 km marching event. The event was a great celebration, a large part of the local population assisting on the side of the road crossed by Rădulescu.

Unfortunately, in the next years there are no signs of any track and field competition. The crisis present all over the country, as well as the beginning of the war have undermined the practice of this sport, but the basis created through the sections that were present back then was decisive for the later results that made Bacau a city with traditions in this sport.

**Soccer/Football**

This is the sport that enjoyed most of the attention from the Bacau public. In 1930, it was practiced as local encounters between the county teams existing back then, and sometimes between a local team and one outside the county. Founded in 1928 (January), the CFR Cultural-Sportive Association, which had gymnastics, boxing, tennis sections, also had the strongest local football section. It had its own stadium, on Oituz street (the current CFR residential complex), where it played its matches, well liked by the Bacau people.

The Bacau high-schools also organized competitions in which the students fought valiantly for the town supremacy. Such a moment is very lively commented on May 25, in "Bacaul". At that date there was an encounter between the team of the "Normal School" and the "Ferdinand High-school" team. Here is how of the sports column writer (who signed with the initials C.I.) described it:

*"On Sunday, May 11, in the beautiful arena of the local Normal School there was an interesting match of football, between the teams of Ferdinand I and the Normal School's... the attacks, although well lead by Moiceanu, cannot open the score, because of the Normalists' great vitality... The high-school in on the offensive again, and, well-fueled by Stoican, manages through the excellent attacker Moiceanu to score two points within record time... in the second half, the game is much more lively. The Normal School dominates most of the second half, still Alexandrescu scores the third point, as a result of a wonderful combination with Lungu and Cobalzi... the game is finished without anyone being able to bring any modification to the result. Professor Mina Livezeanu's refereeing was excellent and correct, as always."*

Although it was not at the level of a Bucharest, PLoiesti, Arad, Timisoara, or Lugoj competition, football was very popular with the Bacau public.

In 1931 there is a great sportive event that will sharpen the football competitions in Bacau, and in Moldavia. At the initiative of lt. Ghermănescu, cpt. Bianchi, prof. Gheorghiu, slt. Săvescu, slt. Antonescu, E. Palade, slt. Profiriu, and others, on April 15 the "Stadiul Bacauan" Sportive Association is created. Having its own well trained football team, this association manages to set itself apart also in the neighboring areas (Roman, Piatra Neamt, Buhusi, Focsani), presenting itself as a team of national level. Until August 3, 1931, it manages to score "five victories and two nulls, out of seven matches" (the Sports Column of "Bacaul"). Some of the section founders are also part of the team. Now it was expected for them to play with the strong Iasi team, the "Victoria", and at the end of his column, after presenting the players and their positions, the writer predicts:

*"this will surely attract a large public".*

And so it did. The Bacau people fill the stadium seats in larger and larger numbers during the games. The football phenomenon is commented at every corner. Practically, in the sports columns of the two Bacau newspapers, "Bacaul" and "Curentul Bacaului" appear only lines about football, with very few mentions of other sports.

On October 1, 1932, as commendation for its sportive work, the Romanian Federation of Association Football, with its headquarters in Bucharest, allows Bacau to organize a chapter in this part of the country. Now the Bacau District is formed, with its capital in this town, a district that at that time comprised the areas of Bacău, Neamț, and Roman.

The general secretary of the district is named Lieutenant Corneliu Ghermănescu, who in 1933, with Professor Gheorghiu, accomplishes the well-known fusion between the "Stadiul Băcăuan", and the "Prince Michael Society". (File 73/1933, Bacău City Hall)

These events created the premise for the local development of other sports, besides football: tennis, boxing, shooting, volleyball, athletics, etc.

Still, the initiatives are not supported by the Town Hall, lead by Mayor Văgănescu. In the files mentioned above we can see the difficulty with which the sports were financed (file 75/1934).

The crisis influences also the development of the football competitions, which are not anymore the spectacle they used to be. Such an example we can find in a July 29, 1935 issue, when the notions of *Sport and Sportiveness* are the subject of an article entitled just that. The "Bacaul" criticizes the manner in which the teams C.F.R. and Stadiul Băcăuan play, as seen during the local derby, and their unsportsmanlike gestures that degenerated in a collective brawl.

Despite the bad show moments, the spectators are the only ones who support this sport. The "Stadiul", despite its difficulties, manages to win in the same year the game with the district champion, Textila Buhuşi (5-0). "Bacăul" noted (November 15, 1935):

*"After the division failure in front of Ceahlau, in the match with Textila they have proven to be the best team in the region... Today when in the rest of the country sacrifices are made for raising the athletic level, Moldavia stagnates in the same rudimentary state, because sports are not understood and are not given any chance".*

The statement of the anonymous journalist confirms the lack of attention the sports received in Moldavia, even football arriving here relatively late, while in the rest of the country there were strong clubs,

such as F.C. Colţea, Teiul, Venus, (Bucharest), Chinezul, Ripensia (Timişoara), AMEFA (Arad), etc. that were competing in a strong championship.

In Bacau, the local journalists try to influence the public opinion through their articles. Here are some of them:

Sport and Sportiveness (July 29, 1935), Consideration (November 11, 1935), Sport in a few lines (a column that appeared for several years), Reflections at a crossroads, (March 23, 1936), PRO SPORT (August 12, 1937), Sports Documentary (August 9, 1937) - "Bacăul".

Between 1936 and 1937, "Stadiul Bacauan" plays in the Ripensia Championship - Schomii Pasta. The games were played on the courts belonging to the newly founded Association, "Muncă şi voe bună" ("Work and good will"), to which the team Muncitorul was affiliated, and on the CFR court. The teams were all from Bacau, and some of them were named after the streets on which their club was found.

During this period, in Bacau appear two athletic groups that will set themselves apart locally, in football: F.C. Letea and Muncitorul. The latter will continue to fight in the following years for the supremacy of the district, taking over from Stadiul Bacauan, which retired. The team quickly becomes the leader of the C Division, with a record of four victories, three null matches, one defeat, and eleven points (Sports in a few lines, "Bacau", November 15, 1937).

In 1939 we also find in the papers that there was a local championship, where the following teams participated in: Muncitorul, Podenii (C.F.R.), F.C. Oituz, Ceramica, F.C. Prut, officials, but mainly working class people, who filled the stadium during game days.

Also in this period, the newspaper "Curentul Bacaului" informs us about the visit of a strong team from the national league, the AMEFA Arad, in Bacau, where it played a friendly game with CFR (May 22,1939).

In 1941, Romania enters the war. The football matches, as was the case with the other sports, are sporadic. A few friendly games are played on July 20, 1942:

Muncitorul -D.V. A. Galaţi 5 -3 ( 3 -1), Venus Botoşani C.F.R. Bacău 4 -2 (1- 0),2 august 1942 Muncitorul - F.C. Adjud 7 -1 ( 3 -O). In this year, the district is moved again to Bacau, after it had its headquarters in Piatra Neamt for a short while. Its president now is counselor Nicolau, none other than the manager of the newspaper "Bacaul". The associations that managed to continue their activity in the harsh times of the later years were: Muncitorul, C.F.R. and Letea Bacău, which have maintained for a long period of time the strength of local sports, until after the war, when new ways of manifestation appeared for this phenomenon.

**Conclusions**

In the interbellum, the physical education and sports in Bacău experienced a high upstart, the period of maximum development being between the years 1934 - 1939, a time unmarked by crisis or war preparations.

The athletic activity in Bacău was always lead by institutions or passionate groups, as follows:

1. The military institution can be considered to be the most prominent promoter of physical education and sports, this being due to the specifics of combat training, and to the education the officers received during military school. It is important to remember that in those times, the main physical education and sports educational institution was lead by a military man, general Bădulescu.

2. The bourgeois circles, dominated by the population of Jewish origin, were the promoter of sportive games in Bacău.

3. Although, we can say that sporadically, the mayor's office supported with funds the organization of athletic activities, being stimulated by the prefect's office, from where the royal orders were generally transmitted.

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***Résumé:*** *Similaire aux modèles dans l'ensemble du monde occidental, le « culte » d'exercices physiques apparaît dans l'environnement urbain de l'ancien Empire à travers les sociétés sportive formées des élèves ou étudiants, mais aussi grâce à des équipes formées dans les différentes unités militaires. Dans le cas des élèves, l'encouragement est venu par le biais de la législation, à la fin du XIXe siècle, en introduisant des classes de gymnastique dans les programmes de l'école intermédiaire et secondaire. Dans l'entre-deux-guerres, l'éducation physique et des sports à Bacău a connu une forte parvenue, la période de développement maximal étant entre les années 1934-1939, un temps non marquée par les préparatifs de guerre ou de crise.*

# RELATIONSHIP BETWEEN SPACE ORIENTATION AND MANUAL LATERALITY

**Dana Badau**
Department of Physical Education and Sports,
"George Baritiu" University – Braşov, Romania

***Abstract:*** *We consider that software usage will increase the improvement of precision in order to determine the level of space orientation according to the manual laterality of sportsmen.*
*There have been relatively poor attempts to implement artificial intelligence techniques in sports that can determine and influence the motric performance. It is a fact that developing and implementing intelligent and informational technology represents a new approach in what the improvement of sportive outcomes are concerned, which leads to a dynamic result of a controlled and optimized training process.*
*The level determination of sportsmen's space orientation depending on the motric prevalence forms an important aspect in sport practice and an essential element in selecting the various sportive disciplines.*
***Key words****: sport, space orientation, manual laterality, technical-tactical actions.*

**Introduction**

Space awareness with accent on surfaces, levels, directions, extensions and trajectories materializes on using space and developing place awareness, where body is found during movement.

As the variation and control of using space facility develops, the sportsman extends the possibility to make an efficient and effective move. In this manner, although the objective is set on the space, the sportsman has to figure out where his body and its segments are found in that space [6].

Software usage will produce improvement of precision in order to determine the level of space orientation depending on the manual laterality of sportsmen practicing handball, where space orientation and technical craft are essential.

Computerized determination of space orientation capacity will allow professionals to optimize the training and manifestation process during sports events within heuristic sportive disciplines, where the level of those elements of psychomotric capacity is essential.

**Theoretical background**

Psychomotricity allows the knowing of human being from the perspective of interrelationship between psychic and motric plan and has a significant role for the psycho-behavioral system of sportsmen.

The area of psychomotricity is broad and has a very complex and varied content. According to the motric behavior plan, psychomotric elements play an important role in the volunteer adjustment of actions, not only referred to intention, space orientation, but also to follow up mechanisms, control and coordination-compensation [4].

The main components of psychomotricity are: body diagram, laterality, space-time organization, general and sequential coordination, static and dynamic balance, ideomotricity, motrical intelligence and motion speed

Every sensorial surface (skin, retina, etc) is directly connected to a specific sensory field, which is found in the opposite cerebral hemisphere corresponding to the sensory surface.

In each cerebral hemisphere is found a motor centre. There are identical connections between the two cerebral hemispheres, and the majority of neurons have a correspondent in the opposite direction.

**Space structure**

Space awareness is a critical aspect. The ability to negotiate space has to be fully developed if an efficient functioning within a space often limited in shape, size, and appliance arrangements is expected as well as if the movement combination with others is expected.

Space notions such as "high-low, left-right, inside-outside, ahead-behind" already used in many of the exercises specific to sportive training can be integrated into sportsmen's perspective if we take into consideration the space-time, thought-action and himself-others relation and also concepts such as: space arrangement, distance, anticipation, transposition., etc.

Research regarding the interrelationship between laterality and space orientation capacity has been conducted by L. Stell, B. Caldwell, D. Dake, M. Saffly and L. Ulch [5].

As a result of evolution, human being has acquired a feature that cannot be encountered on any other life form on Earth, namely, the specializing of human hemispheres for certain specific activities, and this is called "laterality".

Francine Lauzon considers laterality as "the interiorized knowledge of the two parts of the body" [4]. This translates by the perfection utilization of one of the body parts in executing motric tasks, using the ability to differentiate the left part from the right part. Laterality manifests in the arm's left or right predominance, the eye's or legs in executing praxis.

We can consider laterality as internal awareness of the two body parts as well as awareness of the fact that they are different. If this distinction concept is not acquired, it becomes very difficult to learn to coordinate yourself.

All research prove that lateral dominance manifests through a relative functional prevalence (we cannot talk about 100% left handed or right handed people) and its intensity is influenced by multiple causes.

The dominance of one of the cerebral hemispheres is expressed through motric prevalence on the opposite part of the body, therefore the right handed has a dominant left hemisphere and the left handed has a dominant right hemisphere.

The competencies of each cerebral hemisphere are different, specializing as a consequence of human evolution process. Both hemispheres participate simultaneously to carry out every function, but the influence of their contribution is different according to the nature of the stimulant or task.

The operational capacities of the cerebral hemispheres depend on the implied mechanisms to carry out a given function and not on the type of information that has to be treated.

The elements that determine the contribution of each hemisphere to complete a function are: the nature of the task, the context situation and the embraced resolving strategies [1].

**Laterality manifestation**

*Crossed laterality* – the ability to use opposite parts, inferior or superior of the body, synchronizing with each other (for example: moving the right arm and the left leg). Crossed laterality arm-dominant eye is considered to affect performance in some sports such as target firing.

Crossed laterality can be encountered in children before establishing the dominant arm particularities. It is known that if a child has learning problems he is either left handed or with crossed or opposite laterality and this is why the causes of these problems have to be carefully identified.

*Laterality* – the ability to use segments and pairs of organs from only one part of the body; (for example: the left hand and leg, the left hand and eye).

*Bilateralism* - the ability to use the inferior or superior half of the body independently (the arms execute a certain move, the legs a totally different one).

Various specialists mistake the term of bilateralism with the sportsmen availability to perform on both sides of the field.

Many scientists dealt with the delimitation issue of cerebral hemispheres specialization, which led to numerous classifications. To complete a task, the cerebral hemispheres contribute differently due to the following factors: the nature of the task, the circumstances and the resolving strategies [1]. The cerebral hemispheres' abilities are presented [3] in the Table 1.

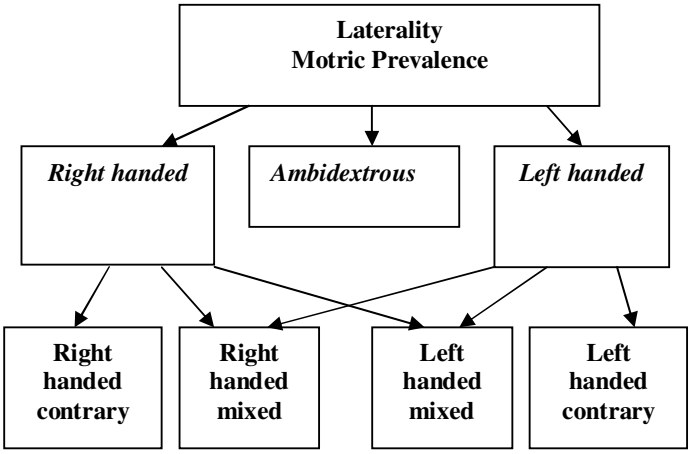
| Left hemispehere dominance | General function | Right hemipshere dominance |
|---|---|---|
| - words<br>- letters | Visual | - geometrical model<br>- faces<br>- emotional expressions |
| Lingvistic sounds | Auditive | - non lingvistic sounds<br>- music |
| Movement groups | Tactil | - tactil sense<br>- braille writing |
| Movement groups | Motion | Space movement |
| Verbal memory | Memory | Non verbal memory |
| - speech<br>- reading<br>- writing | Language | Emotional satisfaction |
| Arithmetics | Space ability | - Geometry<br>- direction<br>- distance |

**Types of laterality**

According to a given segment the following types of laterality are encountered: Manual; Podal; Ocular; Acoustic; Combinations of them.

According to the motric prevalence characteristics the subjects are divided in: Left handed; Right handed; Ambidextrous.

We consider that depending on the motric prevalence, the subjects division can be represented in the following scheme:




The main characteristics and differentiations of the types of laterality are:

- complete left handed – the subjects that use predominantly the left arm, leg, eye and ear on the basis of a right cerebral dominance;
- complete right handed – the subject that uses predominantly the right arm, leg, eye and ear on the basis of a left cerebral dominance;
- for many subjects the laterality is crossed and every one differentiates by his own laterality formula (left handed or right handed according to the analyzed level);
- ambidextrous – the person that uses with the same ability both symmetrical segments;
- mixed left and right handed – those persons that carry out some actions with one part of the body and other actions with the opposite part (for example: children that hit with the left arm and throw with the right arm);
- false left or right handed – (contrary left handed or right handed) – the person using the left or right segment (left/right arm and leg) as an effect of their training, forced by certain accidents of the right segments.

The symmetric learning of motric skills specific to handball, but also the other sports branches, determines a harmonious bilateral development of the body, mitigating the negative effects which emerge as a consequence of the practiced sport.

We consider that the symmetrization process of the technical-tactical actions must be in the future a permanent concern of specialists, because the game's technique is permanently renewing, and the education of players' ambidextry may constitute an advantage in efficientzing the game [1].

The specialists in this field try to create new models superior to the actual ones, which are modified according to the new evolutive tendencies.

We consider that the education of players' ambidextry, no matter the practiced sport, shall determine an enrichment of the space orientation, the game rhythm by the increase of the technical-tactical mastery, by improving the capacity to handle the ball and to evolve on both sides of the sports ground [1].

**Problem solution**

**The purpose and hypothesis of the research**

We have set as a main purpose the computerized testing of the sportsmen's space orientation capacity level according to the manual laterality, using special software, with the view of optimizing sportsmen selection and training processes.

To elaborate the hypotheses of the research we have started from the following assumptions:

- Space orientation capacity is determined by the sportsmen's motric prevalence.
- Using software can determine the increase of precision of space orientation capacity level.

**Means and tools of research**

We started the research from the idea that by testing space orientation capacity according to sportsmen's motric prevalence with the help of software, the precision degree increases and the influence of external variables is diminished.

The research took place in August 2009 and covered a total number of 40 subjects (20 sportsmen and 20 sportswomen) handball players, within the age group of 19-25 years, 20 of them having a right manual dominance (right motric manual prevalence, therefore left cerebral hemisphere dominance) and the other 20 having a left manual dominance (right cerebral hemisphere dominance)

The subjects were put trough the **Labyrinth Test** for which a software was created requiring the following materials: a computer, a joystick, a microphone connected to the computer, a software with the help of which two labyrinths were drawn - one for the left hand, another one for the right hand.

The duration of each test was of 2 minutes, with a number of 100 labyrinth fragments.

Sportsmen received instructions regarding the testing method, the joystick manipulation method and the fact that they had to pronounce out load the direction in which it had to be headed (identifying the movement direction was important because of the way sportsmen orientated; if they hadn't identified the right direction it would have been a simple exercise of line following).

All subjects were allowed to practice before starting the test: the first labyrinth consisted of guiding

the slide with the right hand, and for the second labyrinth with the left hand.

The left handed group: made of 10 - Division-National League.

The skilled software kept not only the time of the testing but also the correct and wrong answers, by recognizing the accuracy of verbal responses.

From the various arithmetical and statistic coefficients we consider useful to analyze the testing results:

- The arithmetic average – X;
- Standard deviation – S;
-Variability coefficient – CV.

**Research organization**

The research developed in August 2009 covered a number of 40 sportsmen which were divided in two groups: sportswomen and 10 sportsmen, having a predominant left arm, components of both feminine and masculine teams of handball players - Division-National League.

The right handed group: made of 10 sportswomen and 10 sportsmen, having a predominant right arm, components of both feminine and masculine teams of handball players - Division-National League.

*Table 2 – Result summary – 1st Labyrinth Test for the right hand*

| Labirynth test 1 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sportswomen group | | | | Sportsmen group | | | |
| Statistic indeces | Right hander | Left hander | Difference | Statistic indeces | Right hander | Left hander | Difference |
| X-Errors | 21 | 19 | 3 | X Errors | 23 | 20 | 2 |
| S | 1,59 | 1,21 | - | S | 1,56 | 0,98 | - |
| CV | 7,57% | 5,78% | - | CV | 6,78% | 4.90% | - |

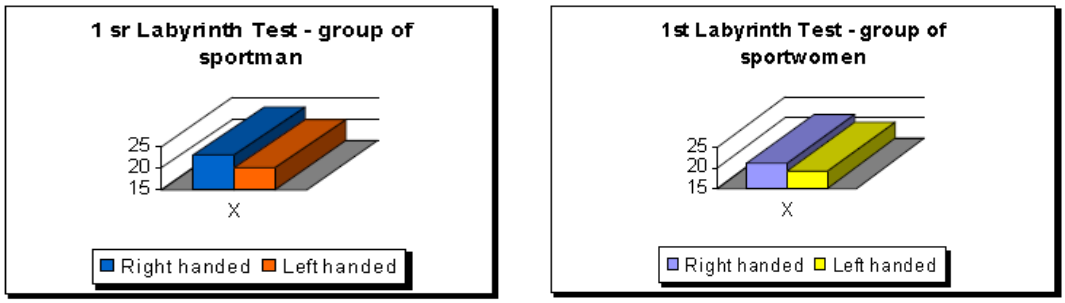



*Fig.1, 2 Graphic representation of arithmetical average for the first Labyrinth Test*

*Table 3 – Result summary – 2nd Labyrinth Test for the left hand*

| Labyrinth test 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sportswomen group | | | | Sportsmen group | | | |
| Statistic indeces | Right hander | Right hander | Difference | Statistic indeces | Right hander | Right hander | Difference |
| X – Errors | 38 | 16 | 22 | X – Errors | 32 | 20 | 12 |
| S | 3,34 | 1,08 | - | S | 2,98 | 1,23 | - |
| CV | 8,78% | 6,75% | - | CV | 9,31% | 6,16% | - |

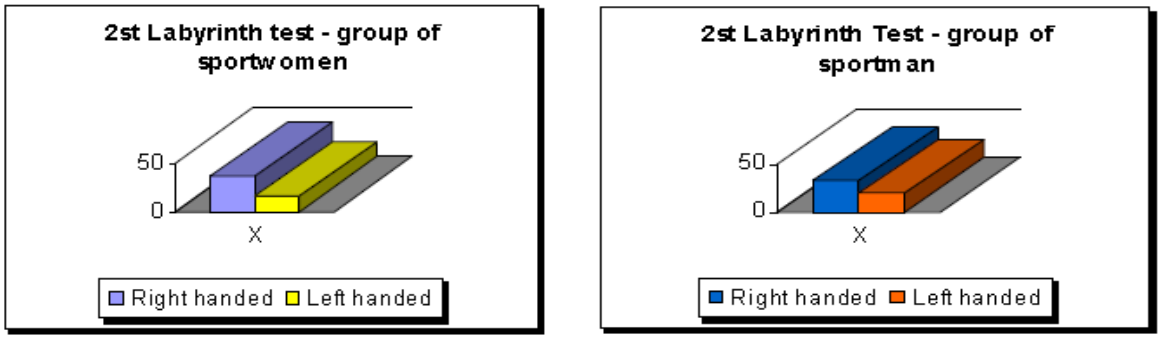



*Fig. 3, 4 Test and Graphic representation of arithmetical average for the second Labyrinth Test*

**Conclusions**

Results confirmed the premises of this research and reflected the fact that using computerized means to determine space orientation capacity according to the motric prevalence of sportsmen can lead to the increase of evaluation precision.

The left hander's results, equally for men and women, were obviously superior to the ones of the right hander's, but it was fascinating to discover that the variance was larger in the case of left handers. It is known that abilities development for just one arm is determined by genetic and hormonal regulators.

The conclusion of this experiment was that not all left hand persons are alike, some of them are right handed but they suffer a kind of progenital anomaly and one of their cerebral hemispheres replaces the other one in order to coordinate the dominant hand. Therefore, the left hander's group has more "authentic right handers" and the right hander's group has "authentic left handers."

With regard to researching the difference of cerebral processing, referred to space abilities among men and women, the results of our research contribute to the confirmation of previous research which suggests that there are several laterality differences, not only structural but also functional.

Consequently, according to these, women have better space orientation as compared to men, as well as better perception and space visualization.

The technique is the component that designates and particularizes the structure of each sports game. The systematic training process for increase space orientation the game actions determines the increase of the players' efficiency and implicitly the teams' in the official and friendly collations.

As a result of this research we can recommend the following:

- Extending the usage of technology specific to artificial intelligence in sports in order to improve the sportive performance.

- Using special software to optimize sportive performance which can determine the rationalization of the training process and the increase selection process efficiency in sports.

Sports games are characterized by the variety and complexity of technical-tactical situations, and also by the actions of partners and opponents, which require to the players a continuous adaptation and efficiency of the entire motric compartment. The modality of carrying out the general training and the specific training for the competitional activity claims to the players a high level of the coordinative and space orientation capacity, which allows an efficient adaptation of the technical-tactical possibilities to the concrete conditions for carrying out the games.

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## Relation entre orientation dans l'espace et la lateralite manuel

***Résumé:*** *Détermination de l'informatique au niveau de l'orientation spatiale du personnel coussins pense que cela va optimiser la formation spécialisée en sport dans lequel les branches de ces composantes de la capacité psychomotrice des athlètes est cruciale.*

*Les tentatives visant à mettre en œuvre des moyens spécifiques de l'intelligence artificielle de déterminer et d'influencer les performances de conduite dans le sport sont relativement faibles. Le fait est que le développement et l'application des technologies de l'information intelligente s'insérer dans les nouvelles lignes directrices pour l'amélioration des résultats sportifs, menant au processus de préparation pour obtenir une contrôleurs dynamique et optimisé.*

*Détermination de l'orientation spatiale selon la prévalence du sport automobile est un aspect très important dans le sport et un élément essentiel dans le sport de sélection spécifiques.*

***Mots clés:*** *- le sport, les actions d'orientation spatiale, manuel côté, actions techniques et tactique.s*

# RESEARCH CONCERNING THE MOTRIC POTENTIAL OF VOLLEYBALL PLAYERS FROM THE URBANAND RURAL ENVIRONMENT

**Benedek Florian**
**Leuciuc Florin**
University "Stefan cel Mare" of Suceava

***Abstract:*** *Volleyball, known as a current Olympic sport, is now in a continuous development, both in terms of training athletes and dynamics of the actual database, because of the progress in such areas that involve: selection, methodology, physical, technical training-tactics, mental preparation and strategy, not least competition.*
*Selection is one of most important factors and most important ingredient in achieving great performance in sport training. While making the study based on the potential of motric volleyball players, first of all I used two groups of beginners, a group of rural, urban and others.*
***Keywords:*** *potential, motive, volleyball, selection.*

**Introduction**

Experts in the domain are of the opinion that outstanding sport performance cam be achieved only with a prosper selection and a permanent increase in sport training, efficiency and adaptation to different types of body exercise.

The selection of elements with special skills for volleyball practice requires patience and sustained activity with special pedagogical and scientific competence. The selection must make a choice of elements "gifted" for peak performance applications that require maximum effort from psycho-somatic-specific functional and technical-tactical. The selection must be started from the knowledge of two realities: the individual and the game features the projected requirements of an order morphological, functional, psychological, cinematic teaching. It must be carried out in stages, based on psycho-physical correlation dynamics and motor development of children with complex applications and specific to volleyball. It involves a series of regular checks able to confirm the child's skills as they manifest themselves concretely in the sports training.

Considering that it must operate continuously from the beginning to the great performance, addressing the bodies in the process of growth and maturity with some psycho-biological dose of unpredictability, the selection should include both diagnostic activities as and forecasting model to prefigure a player model according to the requirements of the game. In this context, the selection must be carried out in stages just as the preparation:

- primary choice or orientation lasting 2 – 3 years, the emphasis in on finding items and begin the volleyball game (organizational group consists of beginners) and the main selection criteria in order of importance are: type constitutional development of the personality traits and qualities and general driving skills;
- selection of secondary or intermediate;
- final or decisive selection.

For successful selection, the coach will be based on the following set of criteria:

a) medical and biological (health, functional integrity of the overall level of physical development);

b) somatic (height, size, type constitutional);

c) driving ability (driving qualities of speed and skill, capacity for learning specific skills)

d) psychological (grade skills development, motivation, affect, such as temperamental and personality traits).

The purpose of this study is to carefully watch how students develop the qualities of the two groups driving. Mention that both groups have used the same type of training, with the same duration and same exercises. So in other words training was identical in both groups. Material and methods used were also identical.

Results and discussion section was intended to centralize the initial control samples of the two groups, then after a period of four months of training identical to centralize control of the same samples in a final evaluation. Obtained after two groups of students were graphically interpreted and conclusions based on graphs in section completed the study and have made proposals for the future.

**Materials and methods**

In this study we started from the assumption that motric potential of students from rural areas is higher that urban's students.

Records were made during the school year 2010 – 2011, starting In October. After setting up the groups an initial assessment of specific measurements and control samples volleyball game was made.

In the study there were two groups of boys volleyball beginners. A group was formed by selecting players from Suceava and the second group was composed of students from rural areas.

The two groups were composed of young students. I have tried to use in training exercises in the school, running exercises for that age group and specific games for increasing speed and volleyball skills.

As training materials we used two gymnastic banks, volley and handball ball, a bar, etc.

From the main used exercises we can remember the following:

1. Place, the signal, execute a fundamental positions high, medium, low; Jogging played at an audible or visual execution from a fundamental position; The same exercise can de used for running;

2. Jogging by jumping over various obstacles and stop the fundamental position of high, medium, low;

3. The professor executes various movements that players imitate, or lead the group travel using visual or auditory signals;

4. The mirrors – pairs, fundamental shift in position whit a stop;

5. Rolling a ball on the ground, in ways and at different speeds, moving players with the added steps, in addition to low – ball position, right, left, forward, backward. Performer is in contact with the ball;

6. Fundamental shift in position among the benchmarks, or travel with a partner transport;

7. Guest running distance of 1 – 2 meter, 20 – 30 meters;

8. Relay balls transport. The team is divided two or three strings. The signal received from each series runs, avoiding a landmark and passes the next ball. The ball may be held as follows: - in both hands – between palm and forearm – from palm, forearm and hip – balanced hand with outstretched arm – between his knees – in pairs, with the ball held in the head, shoulder, hip;

9. "Sowing and harvesting potatoes". The team is divided into two equal three rows and three children first ball in his arms. Before each series, three circles are drawn at intervals of 3 m. At the teacher's signal, the first students runs with the ball, placing one in each circle, passing a milestone and running back to hand the ball over;

10. The ball rolled after milestone. The team is divided into two or more strings equal. The first of each row holds one handball ball in hand. At the signal, he runs with the ball in hand by milestone, it passes the ball rolling and turn it over to the next and continues the action. It can be played also with two balls.

The most commonly used for coordination and exercises are:

- Throwing and catching the ball with two hands at the back – the same exercises but the ball back and then forward with two hands;
- Throwing the ball with two hands, jumping and catching them in the highest point of jumping, with arms stretched above the head;
- Feet, throwing the ball over his head, sits upright and the player catches it without touching the ground – the same exercises, but throwing the ball while sitting down, and afterwards catch the ball standing.

**Result and discussion**

The results of initial and final testing of the volleyball players urban and rural areas, were listed in the summary. As it can be seen from the tables we used control samples: height, scale, standing long jump, 20 m speed, commuter and lifting the abdomen.

In the table no. 1 were written down the initial test results of students from urban (control group). Once you have recorded values of control samples of each sports, we calculated the arithmetic mean of the samples.

*Table 1 The results obtained in control samples; the initial group testing (urban group)*

| No. | Name and surname | Height | Scale | Standing long jump | Running speed 20 m | Commuter | Lifting the abdomen |
|---|---|---|---|---|---|---|---|
| 1 | A. A. | 166 | 165 | 130 | 3.8 | 12 | 22 |
| 2 | B. I. | 155 | 156 | 135 | 3.6 | 9 | 17 |
| 3 | B. B. | 165 | 160 | 110 | 4.0 | 15 | 14 |
| 4 | C. L. | 163 | 167 | 115 | 3.2 | 8 | 12 |
| 5 | C. I. C. | 163 | 162 | 117 | 3.0 | 6 | 11 |
| 6 | G. L. | 158 | 160 | 123 | 4.2 | 10 | 16 |
| 7 | H. M. | 157 | 152 | 105 | 3.8 | 12 | 21 |
| 8 | L. A. | 154 | 155 | 109 | 4.2 | 6 | 13 |
| 9 | L. V. | 156 | 159 | 130 | 4.0 | 8 | 18 |
| 10 | P. D. | 159 | 162 | 115 | 3.2 | 5 | 10 |
| 11 | N. L. | 158 | 157 | 112 | 4.2 | 7 | 15 |
| 12 | S. I. | 156 | 158 | 107 | 3.8 | 10 | 19 |
| The Arithmetic Mean | | **159.16** | **159.41** | **117.33** | **3.75** | **9** | **15.66** |

In the table number 2 we have final test results of students from urban areas (control groups). In this case we calculated the arithmetic mean of control samples.

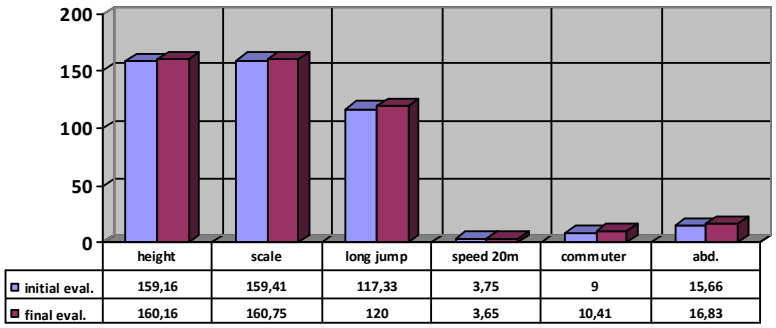
*Table 2 The results obtained in control samples; the initial group testing (urban group)*

| No. | Name and surname | Height | Scale | Standing long jump | Running speed 20 m | Commuter | Lifting the abdomen |
|---|---|---|---|---|---|---|---|
| 1 | A. A. | 168 | 168 | 135 | 3.6 | 11 | 20 |
| 2 | B. I. | 157 | 156 | 143 | 3.6 | 10 | 19 |
| 3 | B. B. | 168 | 162 | 115 | 3.8 | 16 | 15 |
| 4 | C. L. | 163 | 167 | 112 | 3.4 | 10 | 17 |
| 5 | C. I. C. | 165 | 164 | 121 | 3.2 | 8 | 12 |
| 6 | G. L. | 160 | 161 | 120 | 3.8 | 10 | 18 |
| 7 | H. M. | 157 | 154 | 110 | 3.8 | 14 | 22 |
| 8 | L. A. | 156 | 155 | 110 | 4.0 | 7 | 15 |
| 9 | L. V. | 157 | 161 | 137 | 3.8 | 9 | 18 |
| 10 | P. D. | 160 | 162 | 112 | 3.2 | 8 | 12 |
| 11 | N. L. | 159 | 159 | 115 | 4.0 | 10 | 16 |
| 12 | S. I. | 158 | 160 | 110 | 3.6 | 12 | 18 |
| The Arithmetic Mean | | **160.66** | **160.75** | **120** | **3.65** | **10.41** | **16.83** |

With the help of the summary tables I also created a chart illustrating the arithmetic interpretation of initial and final evaluation.

With to the arithmetic interpretation of initial and final control samples of small urban volleyball players are in an increase of all values, which is evident in the long jump on the spot. In long jump you can see an increase in the arithmetic average of almost 3 meters.

At that scale height measurements we can also see an increase witch means that students from urban group are likely increase over average height.




*Graphic 1 arithmetic average initial and final assessment urban groups*

*Table 3 The results obtained in control samples; the initial group testing (rural group)*

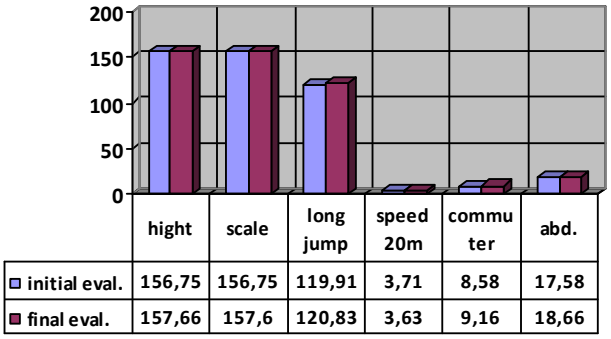
| No. | Name and surname | Height | Scale | Standing long jump | Running speed 20 m | Commuter | Lifting the abdomen |
|---|---|---|---|---|---|---|---|
| 1 | A. C. | 161 | 160 | 135 | 3.4 | 10 | 20 |
| 2 | A. I. | 152 | 151 | 130 | 3.8 | 8 | 22 |
| 3 | B. I. | 163 | 159 | 115 | 3.8 | 12 | 18 |
| 4 | B.S | 161 | 162 | 115 | 3.4 | 9 | 15 |
| 5 | D. F. | 160 | 159 | 117 | 3.2 | 5 | 17 |
| 6 | H. I. | 155 | 159 | 120 | 4.0 | 9 | 14 |
| 7 | I. I. | 155 | 153 | 110 | 3.8 | 12 | 19 |
| 8 | M. I. C. | 154 | 154 | 115 | 4.0 | 7 | 17 |
| 9 | N. S. | 155 | 156 | 135 | 4.0 | 8 | 17 |
| 10 | P . S. | 154 | 155 | 115 | 3.4 | 6 | 15 |
| 11 | P. B. | 155 | 157 | 115 | 4.0 | 8 | 19 |
| 12 | S. T. D. | 156 | 156 | 117 | 3.8 | 9 | 18 |
| The Arithmetic Mean | | **156.75** | **156.75** | **119.91** | **3.71** | **8.58** | **17.58** |

Table number 4 presents the final test results that rural students (experimental group).

*Table 4 The results obtained in control samples; final test (rural group)*

| No. | Name and surname | Height | Scale | Standing long jump | Running speed 20 m | Commuter | Lifting the abdomen |
|---|---|---|---|---|---|---|---|
| 1 | A. C. | 162 | 160 | 134 | 3.6 | 11 | 22 |
| 2 | A. I. | 154 | 153 | 135 | 3.6 | 9 | 25 |
| 3 | B. I. | 161 | 159 | 112 | 3.8 | 10 | 20 |
| 4 | B.S | 163 | 163 | 118 | 3.2 | 10 | 18 |
| 5 | D. F. | 160 | 160 | 120 | 3.2 | 7 | 16 |
| 6 | H. I. | 156 | 159 | 118 | 3.8 | 8 | 15 |
| 7 | I. I. | 155 | 154 | 115 | 3.6 | 14 | 20 |
| 8 | M. I. C. | 156 | 155 | 115 | 4.0 | 8 | 19 |
| 9 | N. S. | 156 | 156 | 132 | 3.8 | 8 | 16 |
| 10 | P . S. | 156 | 156 | 118 | 3.4 | 7 | 18 |
| 11 | P. B. | 156 | 157 | 118 | 4.0 | 8 | 16 |
| 12 | S. T. D. | 157 | 158 | 115 | 3.6 | 10 | 19 |
| The Arithmetic Mean | | **157.66** | **157.50** | **120.83** | **3.63** | **9.16** | **18.66** |

Of the two summary tables 3 and 4 we came to the conclusion that the chart number 2 represented the arithmetic mean of initial and final evaluations of students from rural areas.




*Graphic 2 arithmetic average initial and final assessment experimental groups*

If we compare the two charts, it can be seen that out of the six control samples, these two groups have obtained better values at the final than at initial testing. They manage to get a higher score in the final testing, that the arithmetic mean to the initial testing.

From the two graphics containg summary notes we that the average height of small athletes is higher in urban than in rural areas both at initial testing and final testing. The initial testing has an arithmetic difference 2.41 cm in favor of urban and final testing of the difference increases to 2.5 cm.

Even though the arithmetic measurement scale of the two groups shows increase in both samples, the urban group has an average hight as 2.66 cm. at initial testing and final testing of 3.15 cm.

An increase in score is observed in the long jump test, the only testing in which the rural group scored better in the initial testing (2.58 cm) than in the final testing (0.83). This shows that the rural group has a superior force of lower limbs in urban areas.

In sample 4 (running speed) also the score is favorable the rural group at both test (0.03 s) at initial testing (0.02 s) to final testing.

Same with other progress evidence is achieved, the final testing (sample 5) score increased in both groups only that this time is in advance for urban areas (0.42) at initial testing and (1.25) in final testing. This shows that urban students are more skilled than those in rural areas.

Progress is observed in the last sample, when the score was favorable for the abdomen lifting for the rural group in both trials, respectively (1.92 up) on initial testing and (1.83 up) to final testing.

**Conclusion**

The study, from which we started hypothesis was partially confirmed, because we concluded that the rural group is superior to the test that strength, but are inferior to the samples that require skills.

We have concluded that regardless of motor development presented at initial testing of the two groups, using an optimum number of materials and exercises can

reach values close to model selection driving or sometimes even better values than model selection.

In the final test we can see an increase in score for all the control samples.

In the study, we found the need to use materials in preparation aids such as ball of different sizes and weights, ropes, elastic bands, exercise benches.

I would suggest after researching for this study, that at this age, easy, attractive and dynamic exercises should be used in order to familiarize the students with different objects and also to make them enjoy physical activity.

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# THE BIOMECHANIC ANALYSIS OF THE ARTICULATION TRAJECTORY FIST AND SHOULDER IN THE TECHNICAL EXECUTION OF THROWING "TWO- HANDED CHEST PASS"

**Ciocoiu Dana Lucica,** University "Dunarea de Jos" Galati
**Fleancu Julien Leonard**, University of Piteşti,
**Ciocan Cătălin, University** "Vasile Alecsandri" Bacău

***Abstract:*** *The present work is a sample from an experimental ample study which followed the optimization of technical part in the basketball game, but also general aspects regarding the professional training of students in this faculty. The researched problem was the poor level of technical training at "Basketball" basic course in the present conditions of reduced number of hours, crowded analytical programs and non- partitioned efficiently from the point of view of the content game and the lack of a modern methodology of learning, evaluating, correcting errors of content, resolved by using a video analysis specialised software.*

***Key words****: spatial parameters (segments trajectory), video analysis, biomechanical analysis, articulation fist-shoulder, technical training, throwing two- handed chest pass.*

Biomechanics according to the author D.A. Dainity, cited by D. Colibaba-Evuleţ, I. Bota, (1998) refers to knowledge, analysis and characterization of movements of the following perspectives: kinesiologic (movements study in terms of physiological parameters **University of Piteşti**[2], psychological and mechanical), kinematics (study of temporal characteristics movement, without the forces involved) kinetics and dynamics (study involved forces and changes its structure).

Technical sports games and other sports but succeeded transfer of subjective the evaluation, based on observation of teaching to the use of specialized analysis program, allowing the detection of execution errors at different moments of their movement and prevent a further next training stage.

The methods and techniques of scientific research in the present article are as follows: bibliographic documentation, the method of pedagogical observation, video analysis method, the method of the biomechanical analysis of spatial parameters (trajectory of the movement of segment articulation).

**Organizing research**

The research activity took place in the Faculty of Sports and Physical Education and the Phoenix Sports High school club in Galati. The subjects were 10 students in the Faculty of Sports and Physical Education, selected on the basis of the average grades between 7,40-7,84 obtained in testing the technical procedures, and 3 high performance athletes in the Phoenix club Galaţi.

The specialized program of video analysis was used in other technical programs specific to the basketball game and other sport disciplines (I. Dospineanu, G. Nenciu, V. Potop, M. Creţu, 2005; M.Creţu, 2006; D.L. Ciocoiu, M. Creţu, 2007; D. L.Ciocoiu C. Ciorbă, 2008, D. L.Ciocoiu, 2009; C. Preda, 2010, D.L, Ciocoiu, J.L, Fleancu , 2010 etc).

In the basketball game is required the top of the trunk and upper limbs, the feet represent a mobile and elastic support ready for landings, stopping, changing of directions, etc.

The biomechanical analysis made by applying the specialized soft (*Physics ToolKitt- version 6.0)* for the technical procedure throwing a two- handed chest pass, determines a series of patterns for the horizontal position *(Xm)* and vertical (*Ym)* of the trajectory fist and shoulder. The movement moments analyzed by a methodical point of view were: **M1**- the initial position; **M2-** holding the ball; **M3**- amplitude motion; **M4**- movement coordination; **M5-** releasing the ball pass.

Specific patterns for the horizontal (Xm) and vertical (Xy) variation of the trajectory for the fist and

shoulder for the technique of two- handed ball chest pass are presented in Figure 1.

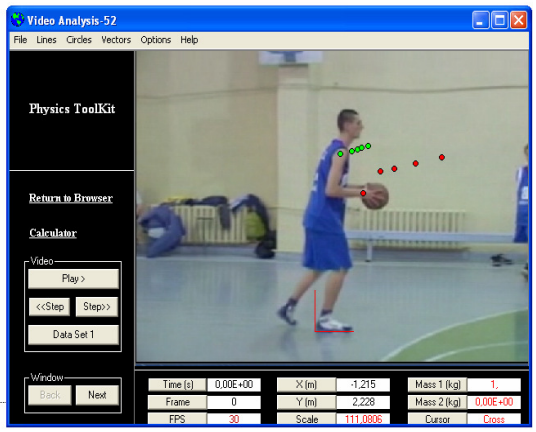


*Figure1. Presentation of movement points at the level of fist and shoulder*

In table 1 are presented the involvement of the fist articulation when conducting the technical procedure throwing of a chest pass, and also the coordinates obtained by the help of video-analysis program along all the five moments.

*Table 1*

*Data processing to fist coordinates în all five points of movement for throwing two- handed ball the chest*

| Time | The data coordinates for the fist in all five moments | | | | | |
|---|---|---|---|---|---|---|
| t(s) | X1(m) | Y1(m) | R1 | Dx1(m) | Dy1(m) | D1(m) |
| 0,00E+00 | 0,443 | 1,185 | 1,265 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| 3,30E-02 | 0,6 | 1,373 | 1,498 | 0,158 | 0,188 | 0,245 |
| 6,70E-02 | 0,728 | 1,395 | 1,574 | 0,285 | 0,21 | 0,354 |
| 1,00E-01 | 0,923 | 1,44 | 1,711 | 0,48 | 0,255 | 0,544 |
| 1,33E-01 | 1,163 | 1,493 | 1,892 | 0,72 | 0,308 | 0,783 |

The evolution of vertical fist following an upward progressive, the initial execution is start at 1.18 m and ends when the ball is released to 1.49 m. The last two points makes a trajectory almost identical motion between 1.44 m (movement coordination) and 1.49 m (releasing the ball).The fourth moment we consider it very important because it relates to ensuring a effective action functional units of arms or legs. The movements coordination is a complex process which is carried only when the sequences have become components of the automated technical procedures.The horizontal trajectory made by the fist articulation (Xm) also presents an upward progresisive evolution in the movement of 0.44 m above the ground and ends when the ball is released to 1.16 m.

The fist coordinates from processing with specialized video analytics software are presented in figure 2.

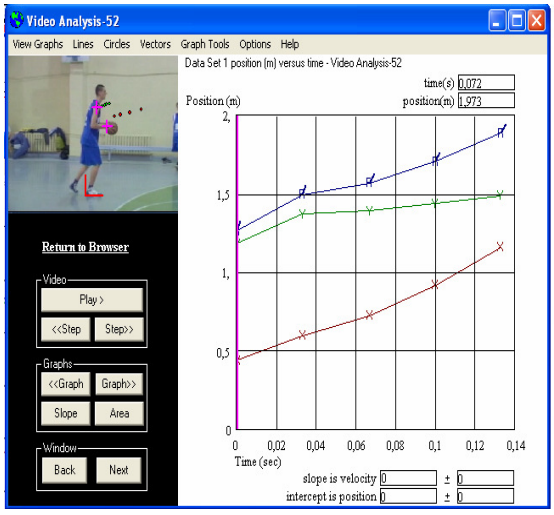


*Figure 2. The graphic of the fist joint position on X and Y(m)axes for the technical procedure:two- handed ball chest passin all the five movement points*

In table 2 are presented the involvement of the shoulder articulation when conducting the technical procedure throwing of a chest pass, and also the coordinates obtained by the help of video-analysis program along all the five moments.

*Table 2*

*Data processing to shoulder coordinates în all five points of movement for throwing two- handed ball the chest*

| Time | The data coordinates for the shoulder în all five moments | | | | | |
|---|---|---|---|---|---|---|
| t(s) | X2(m) | Y2(m) | R2 | Dx2(m) | Dy2(m) | D2(m) |
| 0,00E+00 | 0,233 | 1,523 | 1,541 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| 3,30E-02 | 0,338 | 1,545 | 1,582 | 0,105 | 0,023 | 0,107 |
| 6,70E-02 | 0,39 | 1,56 | 1,608 | 0,158 | 0,038 | 0,162 |
| 1,00E-01 | 0,428 | 1,575 | 1,632 | 0,195 | 0,053 | 0,202 |
| 1,33E-01 | 0,488 | 1,59 | 1,664 | 0,255 | 0,068 | 0,264 |

The vertical trajectory of the shoulder is geared in a constant execution in all five points of movement (1.52 m -1.59 m) with a difference between the two limits of 0.07 m. The shoulder articulation on the horizontal variation of the trajectory during execution, quite reduced (small variation) compared with the vertical limits of the initial and final will be between 0.23 m-0, 48 m.The shoulder coordinates from processing with specialized video analytics software are presented in figure 3.

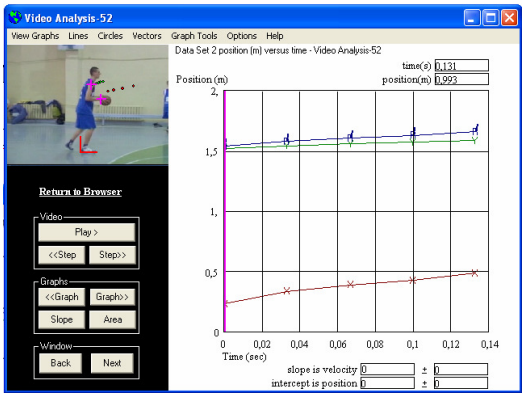


*Figure 3. The graphic of the shoulder joint position on X and Y(m)axes for the technical procedure:two- handed ball chest pass in all the five movement points*

Processing and interpretation of data obtained in this article, underlines that the joint the fist, shoulder trajectory participates at the technical procedure of two-handed ball chest pass different in all the five points of movement. Analysis of the technique with specialized video analytics program will assist in identifying objective motion moments.

**Conclusions:**

- Recovery of practical and methodical obtained data, determines an efficient and rational procedure of two- handed ball chest pass at any stage of training.
- The video analysis method presents an interactive working relying on the specialised software for the used parameters (articulation fist and shoulders) which can help building an efficient methodical step for start-learning-consolidation procedure of two- handed ball chest pass.
- The analysis reveals the major joints involved in the procedure of two- handed ball the chest (**M1**- the initial position; **M2-** holding the ball; **M3**- amplitude motion; **M4**- movement coordination; **M5-** releasing the ball pass).

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**L'analyse biomécanique de la trajectoire poigne, épaule dans la procédure de jeter au panier étant debout**

***Mots clé**: paramètres spatiaux (la trajectoire des segments), vidéo analyse, analyse biomécanique, articulation du poigne, épaule, training technique, passe avec les deux mains de la poitrine.*

***Résumé :** Ce travaille est un extrait d'un étude expérimental qui a visé premièrement l'optimisation du component technique de basket-ball mais aussi des aspects générales regardant le processus de préparation professionnelle des étudiants de la Faculté d'Education Physique et Sport au discipline « Basket-ball » cours de base. La problème enquête a été le niveau déficitaire de préparation technique des étudiants dans les conditions actuelles avec un nombre réduits des heures, des programmes analytiques agglomérés et non compartimentes efficient du point du vue du contenu, la manque d'une méthodologie moderne d'apprendre, consolidation, évaluation, correction des fautes par l'utilisation d'un software d'analyse vidéo spécialisé.*

# STRATEGIES FOR ASSESSING THE DIFFERENCES BETWEEN PROFESSIONAL ATHLETES AND PEOPLE WHO DO NOT PRACTICE ANY ATHLETIC ACTIVITY

**Fleancu Julien Leonard, PhD. - Assoc. Prof** University of Piteşti
**Ciocoiu Dana Lucica, PhD. - Assist. Prof**. "Dunărea de Jos" University, Galati
**Ciocan Catalin, PhD. - Assist. Prof.** "Vasile Alecsandri" University of Bacău

***Abstrac:t** The problem of the athletes' personality particularities is not yet fully clarified, this representing another "white spot" of sportive psychology.The personality traits can be felt in the decision of practicing sports, in choosing a certain sports branch, or in continuing the athletic activity. For our research we chose as test the 16 PF Questionnaire, which approaches the theme of the personality differences between athletes and non-athletes, we chose eight factors (B, C, E, G, M, Q2, I, II) that were tested and will be presented in this study. In their turn, the personality characteristics are influenced by practicing sports, the influence being based on the interaction between the initial structure of the personality and the demands of each sports branch.*
***Keywords**: Personality, athletes, non-athletes.*

**Introduction**

The problem of the athletes' personality particularities is not yet fully clarified, this representing another "white spot" of sportive psychology. G. Rioux (1980) wrote that the person who aspires to top performance must have the following characteristics (Rioux, 1980, apud. Epuran, 1993):

- a balanced personality, aspiring to self-perfection;
- a high energy potential, pushing the individual toward self-assertion;
- an exceptional resistance to frustration;
- a great emotional stability, with the possibility for modulations, supple adaptations adequate to the changing situations.

The meta-analyses done in relation to this theme have shown that the structure of the athlete's personality is not fully clarified, because (Epuran, Holdevici, Tonița, 2001):

- researches are conducted on small groups of subjects that do not allow generalizations and statistical analyses of great magnitude;
- it is not yet clear enough from which level we can start thinking we are dealing with a top class athlete

(club level, national team level, winner of international competitions, etc.);

- the biggest difficulty in studying an athlete's personality is in that, on one hand, multiple sports branches can demand similar psychological features, and on the other hand, the demands of certain sports branches can be very different; so we are more likely to talk about personality profiles on sports branches, than about a personality profile of the athlete in general;
- top results in sports and other activities can be achieved by individuals with very different personality characteristics, and it is virtually impossible to know all of the ways of compensation a human being is capable of;
- it is difficult to catch in an experiment, analytically, all of the psychological particularities and the demands of one sports branch or another.

Despite these difficulties, the study of the personality particularities in sports has made obvious progress, and the practical results have made their appearance (Singer, Murphey, Tennant, 1993).

The personality traits can be felt in the decision of practicing sports, in choosing a certain sports branch, or in continuing the athletic activity.

In their turn, the personality characteristics are influenced by practicing sports, the influence being based on the interaction between the initial structure of the personality and the demands of each sports branch.

Sportive psychology studies have emphasized also certain differences between successful and less successful athletes.

Even if we cannot speak of an athlete model per se, most authors agree that some personality traits appear more frequently in athletes, in comparison with the non-athletes.

After comparing the athletes with the non-athletes, some authors say that the athletes develop a better stress tolerance than the non-athletes. Singer, Murphey & Tennant (1993) have studied certain aspects of stress tolerance in boxers, correlated with certain psychological factors of adaptation to the effort.

They observed that increasing the level of training and adaptation to its increased demands do not reduce stress, but on the contrary, it intensifies it. At the same time, the stress tolerance is increased, the athlete learning to keep himself within effective parameters. Furthermore, the athletes assess their mindset as very good, the stress remaining unnoticed.

Because the athletes are not always objective in self-assessing their own states of mind, we consider that the RED measurement is a very effective indicator for determining the individual's reaction to stress (Holdevici, 1993).

The typical reactions could be described as follows: before a less important game, the simple reaction speed decreases, and the precision of the anticipative reaction is slightly increased; in the case of a game of average importance, the simple reaction speed slightly increases, and the precision of the anticipative reaction is significantly increased.

Rodionov and Başkin have studied the basketball players' psychological reaction to stress. The psychological indicators have emphasized the fact that before the first game in a tournament, the basketball players are strongly affected by stress, no matter the importance of the game, and the possibilities of the opponent. The manifestations observed by the authors are disorganizing, creating a typical picture of distress.

After the first game, the distress picture is considerably smaller, which can be seen by a stabilization of the psychological indicators.

But the tension in the athletes is maintained, not just because of their responsibility, but also because of their reaction to the success or failure of the first game, and as an effect of the anticipation of future games in the championship.

The indicators were in this case also RED, TRS (simple reaction time), and TRA (anticipative reaction time). The indicators observed before the second game have emphasized a certain degree of calming down, with negative effects on the behavior in the court.

Only around the third game we can observe an installment of what the specialists call *"stress tolerance"*. After a successful game, the basketball players manifest a state of eustress (positive, mobilizing stress).

A tactical failure (due to a large number of mistakes) leads to a decrease in the psychological tension after the game.

A major and total failure leads to a state of distress. Taking into account these aspects, the coach must undertake a series of differentiated measures in order to regulate the psychological states of the athletes for the next game.

We must emphasize the fact that if the athletes anticipate a total failure, they will not experience a state of distress after losing the game (Holdevici, 1993).

Many authors believe that resistance to stress depends on a number of psycho-physiological factors. Horn (1992) writes that a combination of anxiety, impulsiveness, and high emotional reaction can most probably lead to distress-like reactions.

Other studies have underlined the fact that the intensity of emotional stress in pre-start situations is correlated with the need for success, or with the tendency to avoid failure. The athletes who are predominantly motivated by achieving success are more likely to have reactions of active mobilization, reactions similar to anger. In the case of the athletes dominated by the will to avoid failure, the most frequent reactions are of anxiety.

Another characteristic that seems to differentiate the athletes from the non-athletes is emotional stability. During a competition, individual ways are formed to adapt the athletes' skills to the real demands. Only by having a high mobility of the conduct and an ability to adapt to the ever changing conditions, the athlete can stand more easily the stress during a competition. The paradox, however, consists in that the mobility and flexibility of the behavior are usually linked with an emotional hyper-reactiveness, even to minor stimuli (apud Holdevici, 1993).

Sperling, after studying a group of 435 subjects, athletes and non-athletes, has proven that generally the athletes show a better emotional stability and adaptation. Nevertheless, Cratty emphasizes, the relations between

emotional adaptation and athletic result are more complex than they may appear on a first look. For example, we must take into consideration also the differences between the athletes specialized in different sports branches. Thus, Shisher, by using the M.M.P.I. test, has shown that swimmers are more emotionally unstable than the athletes practicing a sport that requires a direct body contact with the opponent (apud Epuran, Holdevici, Tonița, 2001).

Although not all the athletes are as emotionally balanced as they would like to appear, many of them have a series o particularities that compensate the insufficient emotional stability (e.g. strength of character, the need to be the best, etc.), features that can assure an optimal psychological state for them during a competition.

**Aim of this research**

The aim is represented by the identification of the differences in personality between the people who are professional athletes, and the people who are not.

**Research hypothesis**

We presume that there are significant differences regarding the structure of their personality between professional athletes and the people who do not practice any sports branch.

**Research methods**

For our research we chose as test the 16 PF Questionnaire, which approaches the theme of the personality differences between athletes and non-athletes, we chose eight factors (B, C, E, G, M, Q2, I, II) that were tested and will be presented in this study.

Finally, the data we analyzed can be seen in

*Table 1*

| Assessed Factor | A Type of sport | B Implic. | AXB |
|---|---|---|---|
| Factor B (gen. resolution ability) | - | - | - |
| Factor C (emotional stability) | - | H | - |
| Factor E (submission-assertion) | - | H | H |
| Factor G (weak superego - strong superego) | - | H | H |
| Factor M (practical-bohemian) | - | H | - |
| Factor Q2 (group dependency – indep.) | H | H | H |
| Factor I (adaptation-anxiety) | - | - | H |
| Factor II (introversion-extroversion) | H | H | H |

We can observe the fact that there are differences according to the **sport practiced** by the athlete, regarding the:

a. factor Q2 (group dependency-personal independence);
b. factor II (introversion-extroversion)

According to the **intensity of involvement in athletic activities**, there are differences in all of the tested factors, with the exception of the:

a. factor B (general resolution ability);
b. factor I (adaptation-anxiety).

Finally, according to the **interaction between the two variables**, there are differences regarding the:

a. factor E (submission-assertion);
b. factor G (weak superego - strong superego);
c. factor Q2 (group dependency-personal independence);
c. factor I (adaptation-anxiety);
d. factor II (introversion-extroversion).

**Conclusions:**

1.In *conclusion*, practicing a sport leads on one hand to a better control of the person's native aggressiveness, and on the other, to a voluntary increase of instrumental aggressiveness. That would explain the athletes' higher aggressiveness in comparison with non-athletes, and also the athletes' increased willingness to openly manifest their aggressiveness. The athletes' instrumental aggressiveness seems to be induced by the athletic environment, particularly by the coach. Practicing a sport seems to give a better control of the native aggressiveness only in the case of the athletes with reduced and moderate aggressive tendencies. In the athletes with strong aggressive tendencies, the probability that these would decrease due to the practice of a sport is lower than in the athletes with reduced and moderate aggressive tendencies. The feelings of guilt generated by the open manifestation of aggressiveness can impede the athlete - according to his/her educational experiences in their early childhood - to adopt the level of instrumental aggressiveness required by the athletic environment. The state of fatigue and the anticipation of the sanctions for the aggressive behavior lead to a decrease in the instrumental aggressiveness.

2.In the end, it seems that the athletes have better self-assessment ability than non-athletes. The ability of objective self-assessment is characterized by a realist attitude, self-critical, by a correct demands-possibilities ratio, a correct analysis of the situation, and by establishing certain difficult but achievable aims. This result is explained by the fact that the athlete is familiarized since a very early age with self-analysis, self-control, and behavioral independence (Holdevici, 1993).

3.In conclusion, the personality modifications that are likely to appear as a result of practicing a sport have a special importance, both theoretical, and practical; the experimental data regarding the differences in personality of the athletes and non-athletes are in most part contradictory.The athletes' personality is not a very well contoured psychometric notion, and we cannot talk about a psychological profile of the athlete as a direct consequence of practicing a certain sport.

4.The personality traits influence the decision to practice a certain type of sport, and the intensity of involvement in an athletic activity.

5.The personality characteristics that are related to the initial structure become selection factors for a particular sports branch.In their turn, the personality characteristics are influenced by practicing sports, the influence being based on the interaction between the initial structure of the personality, the demands of each sports branch, and the intensity of involvement in the athletic activity.In the comparative assessment of the personality traits of athletes and non-athletes, the simple participation in an athletic activity is not enough, that is why we must take into consideration also other variables (such as the type of sport, gender, age, etc.).

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**Stratégies pour évaluer les différences dans les athlètes et les personnes qui n'ont pas le sport**

**Mots-clés**: Personnalité, les athlètes, les non-athlètes

***Résumé:*** *La question de personnalité caractéristiques sportives n'est pas encore suffisamment élucidées, il représente toujours l'un des «taches blanches» de la psychologie du sport. Des traits de personnalité coup du chapeau en grande partie dans la décision de participer au sport, le choix des branches du sport ou d'une autre, en continuant l'activité sportive.Pour atteindre son but, nous avons choisi le questionnaire 16 PF test qui aborde le sujet des différences de personnalité entre les athlètes et antisportive, nous avons choisi huit facteurs (B, C, E, G, M, T2, I, II) ont été testés et sera présentée, selon le modèle de recherche proposé. À son tour, caractéristiques de la personnalité sont influencés par le sport, l'influence basée sur l'interaction initiale entre la structure de personnalité et des besoins de chaque branche du sport.*

# EXPERIMENTAL METHOD FOR DETERMING THE GROUND REACTION AND THE ORTHOSTATIC POSITION

**Daniel Ganea, Claudiu Mereuta, Marian Sorin Tudoran, Elena Mereuta**
"Dunarea de Jos" University of Galati, Romania

***Abstract:***
*The paper presents an experimental method used to determine the ground reaction aiming to estimate the orthostatic posture. To achieve this goal we have used sensors placed on the insole in and out of a sport shoe. The experiment proves that the reactive forces were almost even in the second case (when wearing shoes) than the first case (without wearing any shoe and placed on a flat surface), due to the fact that the rubber sole equalizes the reactive forces of the ground and leads to dissipation of stress to the entire foot.*
***Keywords****: orthostatic position, ground reaction, human foot, biomechanics.*

## Introduction

The science of posture deals with the determination and analysis of the smallest deviations from a normal posture, meaning spatial displacement of the body and of each joint, and finding some innovative therapeutic solutions that make symptoms such as back pain, knee or foot pain or even headache disappear, together with the recovery of the normal space posture of the human body [2], [4].

For a smooth functioning of the entire human body, it is very important to maintain the health of our feet. The way we stand or walk can influence positive or negative the whole structure of the body (ankles, knees, hips, column), thus affecting the posture. The posture is the spatial behavior that human body assumes in relation with the environment in which he lives and in relation to laws that govern this ambient, first of all being the gravity. To do this, the human has developed a specialized structure to overcome the gravity, called "tonic postural system for vertical stability" [3]. This system works automatically and involuntarily, doesn't change with physical exercise, gymnastics and depends, essentially, on tactile sensitive information obtained from the plantar of the foot.

The starting point of this study is to develop a system for data collection which provides information about the values of the reactive forces applied on the human foot, generated by the ground, in order to determine the orthostatic position [2].

**Method and experiment**

The basic point of this method is the data transfer from the sensors applied on the insole of a shoe to a computer which computes the analog information (fig.1).

The data gathering system is a device which contains 6 FSR sensors - force sensing resistors (fig.2.) connected to a microcontroller Arduino (Fig.3.). The 6 FRS sensors are attached on the human foot (more precisely on the insole of a shoe) and connected to the Arduino microcontroller [5].

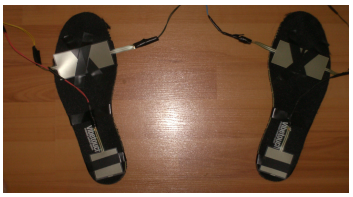
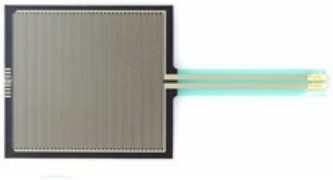




*Fig. 1. The position of sensors Fig.2. FRS sensors Fig.3. Microcontroller Arduino*

The force sensitivity range of these 6 FRS sensors is from 100 g to 10 Kg and the pressure sensitivity range of 0.1 kg/cm$^2$ to 10 kg/cm$^2$ (dependent on mechanics).

The Arduino microcontroller translates the analog signal from the sensors using a code named Arduino language code which is implemented in his memory. Further, the collected data are transformed in visual field by another program called Processing.

The aim of the experiment was to determine the orthostatic position of the human body using the sensors on the insole in and out of a sport shoe.


*Fig.4. The positioning of the sensor on the insole*

The orthopedic position known as orthostatic posture is a reference human position in which the human body is supported only by the feet. The orthostatic position is based on dynamics rather than static balance [4], [6].

Because of the internal and external perturbation factors (respiration, muscles contraction, breezes) the vertical posture needs correction provided by many mechanisms composing the human body, such as the muscular and neural systems.

The amplitude of the internal perturbation arises from the need to maintain a correct vertical posture. A correct vertical posture assumes that the center of mass is situated in the middle of the support area.

We conduct the experiment considering two possible situations:

a) The sensors are attached on the insole without wearing any shoe and placed on a flat surface;

b) The sensors are attached on the insole and placed within sport shoe, with rubber sole.

**Numerical results**

**Sensors attached on the insole without wearing any shoe, placed on a flat surface**

We have collected the ground reaction on the following situations:

a) the subject is sitting;

b) the subject is standing;

a) the human body is bending backwards; bending forward, to the left, to the right;

b) orthopedic posture.

The magnitude and the time evolution of the reactive forces are shown in fig.5 and the average reaction for each sensor is calculated with formula (1) using a numerical method for the calculation of the integral, namely the trapezes method [1], [6], [7]:

$$R_{med} = \frac{1}{T}\int_0^T f(t)dt \tag{1}$$

The values are shown in table 1

*Table 1*

| $R_{med}$ S0 | $R_{med}$ S1 | $R_{med}$ S2 | $R_{med}$ S3 | $R_{med}$ S4 | $R_{med}$ S5 |
|---|---|---|---|---|---|
| 403,087 | 272,6847 | 337,2313 | 419,7902 | 286,943 | 357,094 |

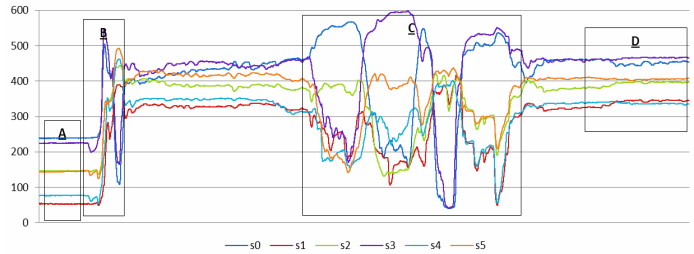



*Fig. 5. The ground reaction - a) Sitting; b) Standing; c) the human body is bending backwards; forward, to the left, to the right; d) Orthopedic position*

We were also able to determine the ground reaction on the left foot (fig.6), on the right foot (fig.7), on the heels (fig.8) and to make a comparison between pairings sensors S1-S4 (fig. 9) and S2-S5 (fig.10).

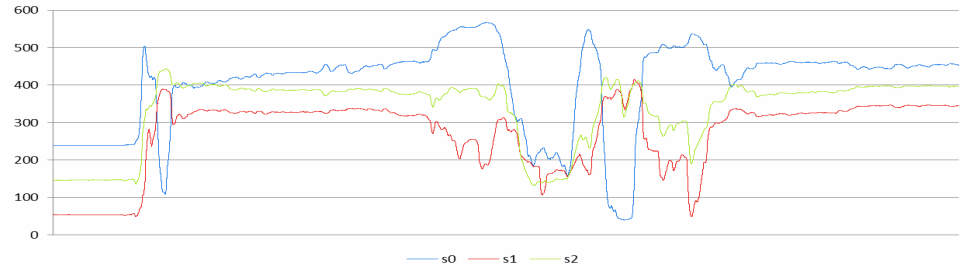



*Fig. 6. The ground reaction on the left foot*

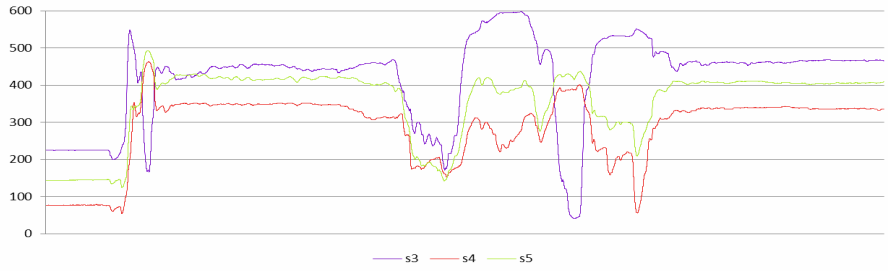



*Fig. 7. The ground reaction on the right foot*

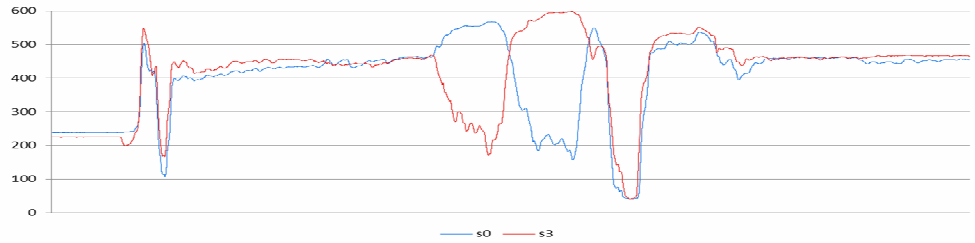



*Fig. 8. The ground reaction on the heels*

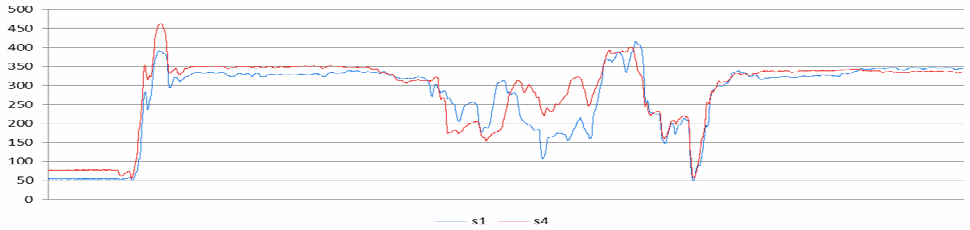



*Fig. 9 The ground reaction comparison between pairings sensors S1-S4*

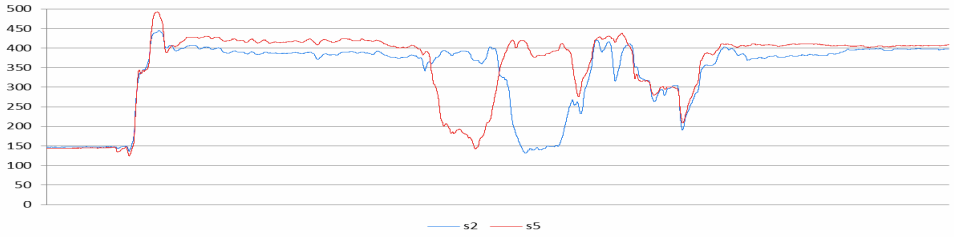



*Fig.10. The ground reaction comparison between pairings sensors S2-S5*

**Sensors attached on the insole, placed within sport shoe with rubber sole**

We have collected the ground reaction on the same situations as in first case, ie:

a) the subject is sitting;

b) the subject is standing;

a) the human body is bending backwards; bending forward, to the left, to the right;

b) orthopedic posture.

The magnitude and the time evolution of the reactive forces are shown in fig.11 and the average reaction for each sensor is calculated with formula (1) using the same numerical method for the calculation of the integral [1], [6], [7]:

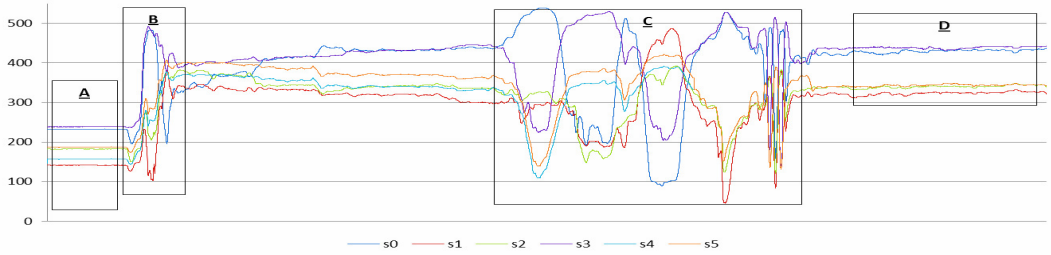



*Fig. 11. The ground reaction - a) Sitting; b) Standing; c) the human body is bending backwards; forward, to the left, to the right; d) Orthopedic position*

The average ground reactions for each sensor are shown in table 2.

*Table 2*

| $R_{med}$ S0 | $R_{med}$ S1 | $R_{med}$ S2 | $R_{med}$ S3 | $R_{med}$ S4 | $R_{med}$ S5 |
|---|---|---|---|---|---|
| 385,840 | 291,383 | 310,0042 | 404,3928 | 313,6811 | 333,1024 |

We were also able to determine the ground reaction on the left foot (fig.12), on the right foot (fig.13), on the heels (fig.14) and to make a comparison between pairings sensors S1-S4 (fig. 15) and S2-S5 (fig.16).

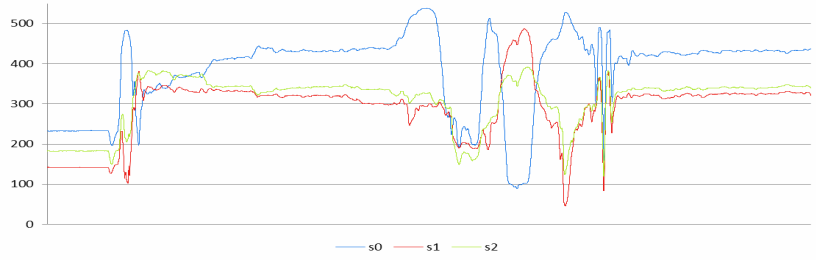



*Fig. 12. The ground reaction on the left foot*

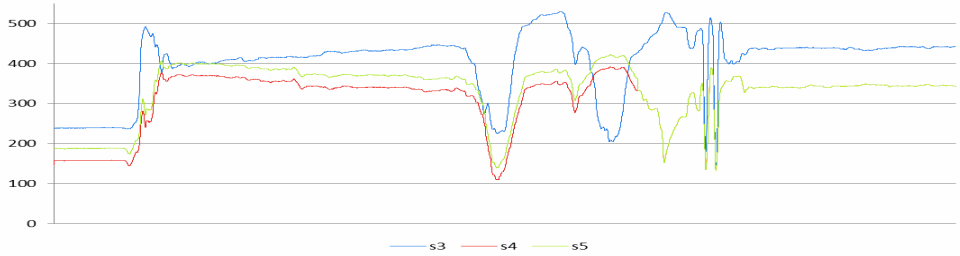



*Fig. 13. The ground reaction on the right foot*

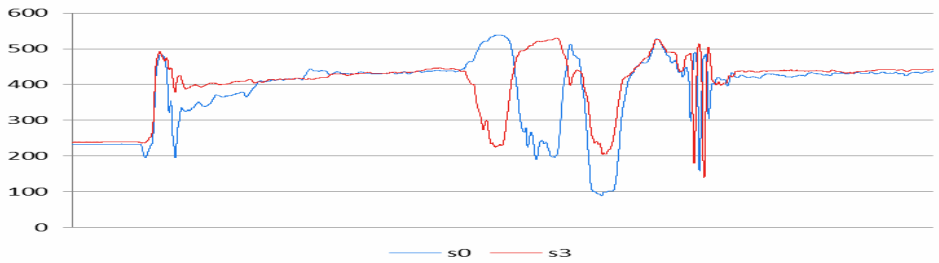



*Fig. 14 The ground reaction on the heels*

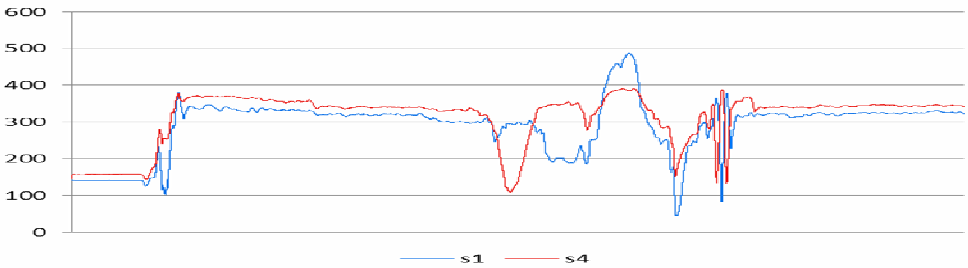



*Fig. 15 The ground reaction comparison between pairings sensors S1-S4*

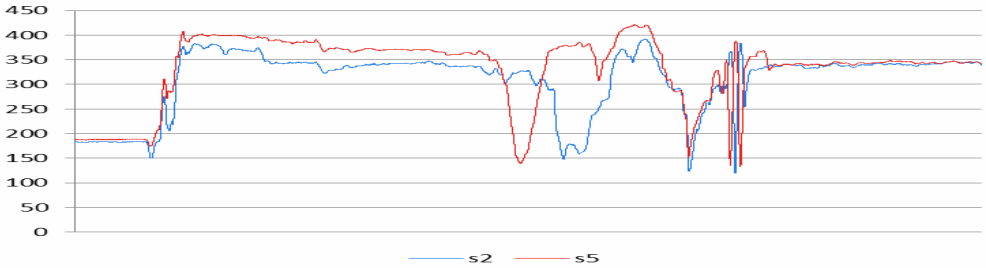
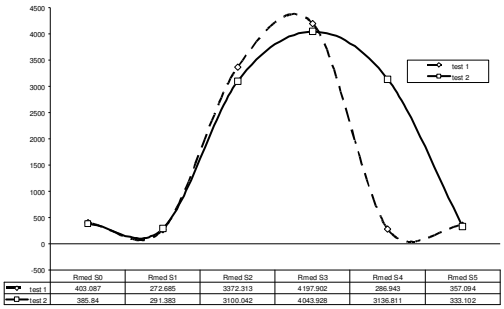



*Fig. 16 The ground reaction comparison between pairings sensors S2-S5*

**Conclusions**

The resulting data shows that the reaction forces on each pair of sensor are approximately equal (fig. 17). The small differences that results are the effects of the human body need to achieve the vertical posture more precisely because of the internal and external perturbation.




| | Rmed S0 | Rmed S1 | Rmed S2 | Rmed S3 | Rmed S4 | Rmed S5 |
|---|---|---|---|---|---|---|
| test 1 | 403.087 | 272.685 | 3372.313 | 4197.902 | 286.943 | 357.094 |
| test 2 | 385.84 | 291.383 | 3100.042 | 4043.928 | 3136.811 | 333.102 |

*Fig. 17. Reaction forces*

The orthopedic position was reached in the D zone of the fig.5 and fig 11. In fig 5 and fig 11 the reactive forces starting from sitting position to the moment when the body is in the orthopedic position are plotted.

Comparing the two experiments we can conclude that the reactive forces of the ground are different when standing and sitting. The reactive forces are almost even in the second case (when wearing shoes) than the first case (without wearing any shoe and placed on a flat surface), due to the fact that the rubber sole which equalizes the reactive forces of the ground leading to dissipation of stress to the entire foot. This dissipation leads to a relaxation effect in the heels area and in the pair S2-S5 (by reducing the reactive forces) and to an increasing in the pair S1-S2.

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## Méthode expérimentale pour obtenir la réaction du sol et la position orthostatique

***Résumé****:Le document présente une méthode expérimentale utilisée pour déterminer la réaction du sol visant à estimer la posture orthostatique. Pour atteindre cet objectif, nous avons utilisé des capteurs placés sur la semelle dans et hors d'une chaussure de sport. Les forces réactives sont presque même dans le second cas (port de chaussures) que le premier cas (sans porter de chaussures et placé sur une surface plane), due au fait que la semelle en caoutchouc égalise les forces réactives du sol et conduit à la dissipation de stress pour l'ensemble du pied.*

***Mots-clés:*** *position orthostatique, réaction du sol, pied humain, biomécanique.*

# A METHODICAL AND TECHNICAL APPROACH REGARDING THE STRETCHING METHODS IN SPORT TRAINING

**Gabriel Gheorghiu, Onet Ioan**
The Faculty of Physical Education and Sports Galati, "Dunarea de Jos" University

***Abstract****: The development of joint mobility and muscle suppleness are formed especially through a training program that aims not only to exercise the capacity of effort, the combined driving abilities specific to football, but also the technical and tactical structures, these being found in the pre competition period. Taking into account the idea that the continuous movement on the field related to football plays an important part in the optimal handling of technical and tactical tasks, the sets of exercises used should aim to the development of endurance in the speed regime, strength in the speed regime, other driving abilities and also strength and endurance of the lower limbs.*
*Any body movement, thus athletic performance, is realized by and with the help of the muscular system. That is precisely why the muscular system comprises a specific anatomical structure and is related to the feeding and communication systems, the blood circulation and the nervous system. To achieve movement, the bones change their connections and their position in space, therefore maintaining a static position happens without making a movement - both of these actions are made by certain muscles of the body, which have particular features. Mobility and flexibility can be achieved through stretching, just as in the case of power, strength and elasticity.*
**Keywords:** *football training, 16-18 year-old juniors, stretching, theoretical approach, methodical approach.*

**Introduction**

The word "stretch", which in English means *the action of stretching a part of your body out to its full length, or a particular way of doing this*, refers to the act of holding for a few seconds a certain position of a certain segment of the human body, and it has the purpose to stretch a muscle and to prepare it for a incoming effort.

There are four important terms which are related to the process of stretching the muscles in order to obtain a greater mobility:

✓ CONTRACTION – takes place when a muscle stretches, leaving from a pause position, then stretching it passively, thus leading to the full contraction of the muscle.

✓ ELONGATION – takes place when the muscle is maintained in a contraction state for a few seconds (i.e. 6 to 30 seconds).

✓ MOBILITY – or freedom of movement, indicates the amplitude of joint movement.

✓ ELASTICITY – is the result of coordination between muscles and nerves. That is why the mobility, muscular strength and movement coordination act simultaneously.

Muscle development and the endurance of muscle fibres concerning intense game play and training physical effort appears around the ages of 16 - 18.

The main aims of the physical exercises related to muscle development are those of enhancing the strain capacity of muscles. This can be achieved through:

✓ defeating one's own body weight or at least of a part of it;

✓ defeating one's own body weight through the opposing action of a partner.

After D. Apolzan (1996), the growth of strength and of muscle force can be achieved most easily around the age 16 – 18 years, during the period in which the junior sportsmen, once their bones' growth has finished, improve their muscle development. It was demonstrated the idea that the muscles which have undergone stretching exercises can carry out more powerful contractions. The *contraction – relaxation – extension* muscle elongation method does not only favour a better muscle elasticity, but it also results in muscle development.

Elasticity plays an important part here since, for various physical exercises, the muscle contraction begins before the stretching action, and assures the relaxation of the antagonist muscles. The muscle elasticity can modify to a greater extent through the influence of neuro – psychological muscle relation processes, and through the stretching exercises.

Mobility aims at the amplitude of movement around a joint structure, and its handling is also a

The optimal frequency of training with isometric contractions in order to enhance muscle force was studied by Th. Hettinger (1967), who considers that the effect is weaker if the training sessions are rare in time. S. Solveborn, B. Anderson (1983), quoted by A. Dragnea (2002), are of opinion that the means of increasing muscle suppleness known as stretching take as a basic principle the three – step muscle action: contraction, relaxation and muscle stretching.

Mobility is usually associated with a good physical improvement, with coordinated movements, and provides a highly – developed locomotor apparatus strategy of preventing accidents from happening. A steady enforcement of a progressive growth of mobility training programme will determine the enhancement of muscle elasticity, thrusting away the strain effects, especially of the leg muscles (T. O. Bompa, 2003).

A. Dragnea and S. M. Teodorescu (2002), consider that the main aim of the mobility development is to favour the technical procedures to take place easily, fluently and sinuously, while the joints' mobility, together with precision and coordination, increases movement quality, thus being a major feature on which the learning and improving of the execution technique is based on, at the age of 16 – 18 years (Figure 1).

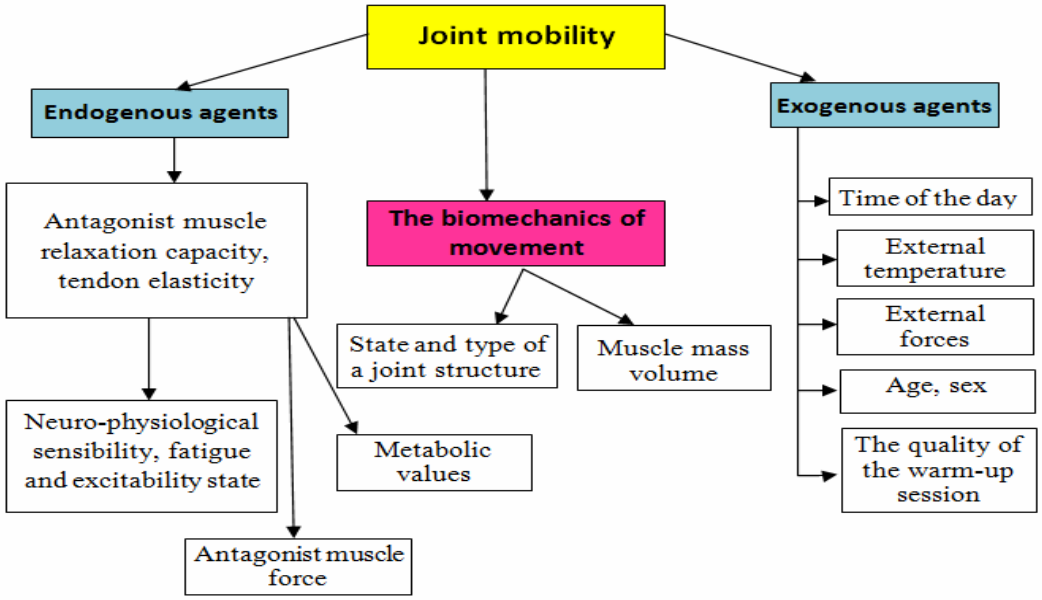


*Figure 1. Mobility and its entailing agents*

H. Russel (1976) studied all the positive physical exercises for the enhancement of mobility in order to obtain elastic tissues. There were established six methods of antagonist muscles' force enhancement in the U.S.A.:

*Ballistic and Hold* – swinging movements are repeated many times, and then, at the third or fourth movement, the part of the body is maintained in practice for six seconds in the extreme position.

*Passive Lift and Hold* – with the help of a partner the leg is taken into the extreme position, where it is maintained in practice for six seconds, while the muscles undergo an isometric contraction.

*Prolonged Stretch* – it is a passive stretching of muscles with the help of a partner, and this method tries to find the extreme position and maintain it for one minute, without reaching the pain threshold.

*Active P.N.F.* – the movement is made for six seconds continuously, and then an extreme isometric contraction follows, opposed to the endurance interposed by the antagonist muscles, for example, with the help of the partner. Furthermore, it tries to enhance the amplitude of movement through an active muscle action, i.e. the antagonist muscles' contraction for one minute, opposed to a withstander.

*Passive P.N.F.* – the joint structures that are to be practised are taken by an opposing partner in the extreme position for six seconds, and then, as in the previous situation, the antagonist muscles' isometric contraction follows, opposed to the endurance interposed by the partner. The passive stretching and contraction of antagonist muscles needs to be repeated every six seconds, for one minute.

*Relaxation Method* – a passive and slow stretching is executed with the help of a partner, until the extreme position is reached. The position is maintained for one minute, while the executioner relaxes psychologically through self – control. When one is aware of the contraction state of the muscles, the executioner participates actively in the deceleration of the stretching reflex. As for the time agent, there are still controversies regarding the duration of the three moments: contraction, relaxation, and stretching.

The first experts used the following time periods: 4 – 6 seconds for muscle contraction, 2 seconds for relaxation, and 8 seconds for stretching.

Later, it was demonstrated that the time period 7 seconds – 2 seconds – 7 seconds is far better than the previous time periods used up to that point.

One minute is recommended for prolonged elongation, and 5 to 10 seconds for static stretching in the extreme position. Many teams in the U.S.A. recommend 6 seconds for both P.N.F. isometric contraction exercises and antagonist muscles' contraction.

The P.N.F. (Hold – Relax) technique was compared to a passive mobilisation and it was observed that there is a quicker enhancement of the amplitude of movement when applying the former technique.

H. Russel and N. Hartley (1976) researched each six American stretching methods, with or without P.N.F. technique.

J. Ekstrand (1978) published various papers which show a visible reduction of muscle accidents cases for footballers, after stretching methods had been applied.

Grahn Von and F. Nordenborg (1979) published an interesting paper on mobility development at the Superior School of Gymnastics and Sports in Sweden, which started from contraction – relaxation – stretching exercises. J. Ekstrand (1981) shows that, by using stretching methods, there is a strong connection between the shortening of adductor muscles and the emergence of injuries on legs.

The main most used muscles in the football game activity are the sterno – cleido – mastoidians, abdominals, external flexors of the coxo – femoral joint, external flexors of the knees joint, external flexors of the tibio – astragalian joint.

The whole activity is dynamic and is assured by the triple extension chain.

1. The kicking of the ball with the leg is the most common action in the game of football. The kick can be executed either from a fix position or from a movement position, directly or through overturn, and the ball is hit with the top of the foot, the sides, the lace or the heel. In order to know the enhancement of the muscles' chain force that take part in the kick, there must be introduced the isometric effort during the training sessions, since the isotonic training is not enough.

2. The knavish movements or dodges represent the most complex executions because they are executed with the legs (there aren't left aside the body or sight dodges), one of the legs simulates the sending of the ball in one direction, in order to then stop the swinging right before kicking the ball, and this action is favoured also by the powerful thrusting in the reliance leg, then the opponent is overtaken on the opposed side of the one in which he was previously engaged in.

3. Jumps, landings, acceleration, and deceleration are all very complex actions which engage a lot of muscle chains. The biomechanical principle of the initial force is used and the enhancement of strength is attributed to the elastic behaviour of muscles. These high values of strength and mobility are obtained only in the case that the elongation – shortening cycle (related to stretching methods) is appropriate.

These stretching methods include firstly the muscle contraction, secondly its partial relaxation through self – braking, and thirdly the passive stretching.

Thus, stretching starts from passive elongation of a muscle group which has previously undergone an isometric contraction. In this way, the braking effect of sensitive corpuscles reacts over the stretching effect, which leads to the muscle relaxation.

As for the enforcement of stretching methods in the training economy, there are some ideas to be taken into account:

- ✓ at the junior age, i.e. 16 to 18 years, these are a priority aim, since the elasticity of the muscles and the endurance of the muscle fibres enlarge, they develop easier and faster, with a less spent time;
- ✓ both muscle elasticity and joint mobility are maintained at a high level;
- ✓ the annual muscle training level curve highlights an increase in the first 3 – 4 months of training, after which it decreases, indicating an equilibrium state, this being precisely the competition period in the case of junior sportsmen.

It would not be worth it to leave out this kind of exercises, even for one week only, since the level of mobility decreases fast and it reaches the initial values rapidly, which can lead to muscle injury.

Thus, in the pre – completion period it is very important that each training session to reach as much as possible the intensity of an official game of football, to be effective and free of risks. There is a strong connection between the straining of the muscles and the emergence of various muscle contractions at footballers; the muscles with a supporting role, also known as the postular muscles, especially the extensors, have more binding tissue, and thus have a tendency to strain and strengthen faster.

The specific training or pre – competition period aims at making the players being in a good shape, especially through the development of the specific training state, which is not to be considered a (muscle) injury.

As the end of this period approaches, the training programme becomes whole, and the game of football is part of it as one of the most important methods of training. During this period, micro – sets of great intensity are executed, with three to six lessons of maximum and sub – maximum intensity, but also micro – sets of deceleration and recovery.

According to certain authors, the game and even the tactics, as a game thinking form, are the expression of

physical potential of the footballers and of the team. Thus, undergoing activities of maximum and sub – maximum intensity is strongly related to the capacity of the anaerobic strength of the muscles engaged. It is the outer part of the thigh that is under discussion, the extensor muscles, the muscles from the inner side of the thigh, the adductor muscles, the claf muscles, the psoasiliac muscles.

If the muscles are working opposed to a withstander, they are getting warm; the bigger the muscles' contraction, the higher the temperature, and that is why the contraction is complete through the stretching methods suggested in the pre – competition period. The muscles' relaxation in the next phase is known to be greater as the contraction was bigger also. This is a very important aspect which needs the muscle to be as relaxed as possible during the stretching period. In order to obtain great modification in the muscle, these methods must be executed for a long period of time.

The strength of the muscle can be enhanced through training, and also through the use of their elasticity. Acceleration – braking exercises are recommended, because these contribute to the improvement of muscles' elasticity. The use of some withstanders (however insignificant), for the acceleration – braking exercises, leads to an increase of the stagnation moment. Furthermore, the contractions of the muscles intensify in order not only to defeat the stagnation pause, but also to stop its acceleration.

It is very important to know that, through these exercises, the nervous mechanisms of coordination strengthen, and that leads to a sudden shift of the state of the muscles: contraction – relaxation – stretching.

This feature describes the exercises submitted in the current paper, exercises which have become the basic method of training sessions in the pre – competition period for the 18 year – old juniors of the L.P.S Galaţi football team. The best chosen moments chosen by me to execute these types of exercises were: the end of the general warm-up session, the breaks between exercises, and the end of the whole training programme. There were twelve exercises at the end, executed in the following way: at the end of the general warm-up we executed the contraction, the relaxation and the stretching of muscles (Stretching Programme 1) and at the end of the training programmes and also in the breaks between exercises, we executed the stretching only (Stretching Programme 2). The time used was 10 seconds for contraction, 2 seconds for muscle relaxation, and 10 seconds for stretching for the Stretching Programme 1. As for the Stretching Programme 2, the time used reached 20 seconds.

The best moment to execute these stretching exercises are, in my opinion, the end of the overall warm – up, the breaks between exercises, and also the end of the whole training programme on the most used muscles, and only muscle stretching exercises were used (T. O. Bompa, 2003).

In football, the repeated movements from the running time, for example, can lead to muscle contractions, and, eventually, to overstretching and injury of the muscles. Thus, these stretching exercises helped me to prevent the injuring of players, and this programme, thoroughly executed in the pre – competition period, led to an enhancement of the elasticity of muscles, releasing the straining effects, and it also engaged the joint mobility which is over solicited in the case of 16 to 18 year – old junior footballers.

I am of opinion that, through a careful programming of the stretching methods throughout the whole season, but with an increase in the pre – competition period, the muscle system will be ready for the more and more intense efforts required by the present football game.

The use of the stretching exercises is necessary because one cannot train "tired" muscles, since there is a high risk of over – training, thus of getting injured. At the age of 16 to 18 years there is no special control of the training state yet, and this is why I consider that stretching exercises come to solve three important directions of the sport training:

- ✓ fast adjustment to the training stimuli;
- ✓ good recovery period between training sessions and competitions;
- ✓ prevention of injuries.

## Conclusions

There are very many repeated movements not only in the sport training, but also in football, for example those from the running session, movements that can lead to over – stretching and powerful contractions of the muscles. Through a careful programming of the stretching methods throughout the whole season, but with an increase in the pre – competition period, the stretching exercises can increase the physical performances as it follows: the flexibility of muscles increases, the strength of muscles increases, there is equilibrium of contractions between the agonist and antagonist muscles, and muscle injuries are avoided.

All in all, by executing stretching exercises, the 16 to 18 year – old junior footballers learn how to "feel" their body, to test the state of their muscles and of the injuries, and this awareness from their part leads to the development of a high sense of self – control and self – confidence, two facts which eventually determine high performance.

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## L'approche théorique et méthodique sur stretching, dans l'entrainement sportif

***Mots-clés**: football formation, juniors 16-18 ans, stretching, l'approche théorique, l'approche méthodique.*

***Résumé**: Développement de la mobilité articulaire et musculaire sous forme de synthèse de souplesse, surtout dans un programme de formation visant la capacité*

*d'exercice, non seulement, combinée qualités de conduite spécifiques au football, mais aussi des structures techniques et tactiques, ceux-ci étant trouvés avec une prédilection période pré compétition. Depuis le match de football déplacement sur le terrain ont un rôle décisif dans la résolution des tâches techniques et tactiques optimales, des structures d'exercices doivent cibler à la fois le développement de la résistance sous la vitesse, la force et la vitesse sous la conduite d'autres compétences, mais et de la puissance et la force dans les jambes. Toute activité physique, et donc la performance sportive, est menée par et à travers le système musculaire. À cette fin, les muscles du corps, a une structure anatomique spécifique et est liée à des systèmes d'alimentation et de la communication, la circulation sanguine et le système nerveux. Pour réaliser le mouvement, le changement des os de leurs connexions et leur position dans l'espace, le maintien d'une position statique est réalisé sans faire un mouvement, les deux sont faites de muscles du corps, montrant quelques fonctionnalités. Comme la force et l'endurance et l'élasticité, la mobilité ou la flexibilité peut être entraîné par stretching.*

# GROWTH FACTORS OF THE RHYTHM OF GAME - OBJECTIVE PRIORITY FOR NATIONAL HANDBALL SENIORS TEAM

**Ghervan Petru**
University "Stefan cel Mare" of Suceava

***Abstract:*** *This material is the result of collaboration readiness of the most representative factors of Romanian Handball Federation and clubs, national team coaches and club teams of seniors, juniors, children, and players with great experience. In total, 378 people were interviewed or responded to questionnaires applied differently for each category during the three years (2008, 2009 and 2010).*
***Keywords****: handball, growth factor, rhythm of game*

**Introduction**

This material is the result of collaboration readiness of the most representative factors of Romanian Handball Federation and clubs, national team coaches and club teams of seniors, juniors, children, and players with great experience. In total, 378 people were interviewed or responded to questionnaires applied differently for each category during the three years (2008, 2009 and 2010).

Following the conclusions from the consultations, we determined the following:

**Causes** leading to the need to increase the rhythm of the game (national team):

First, the game trends recorded at major international competitions:

**Raising spectacular level**

- Dynamic growth in all phases of the game
- Increasing the finish capacity of a big distance from the goal
- Specialization of players only on the attack / defense stage – no tired, players, capable of high-speed executions, but also taking advantage of opportunities arising through changes made in defense
- Defense systems more compact, difficult to penetrate, so the phase II and counterattacks become more efficient solutions
- Changes in regulation that allow rapid resumption of the ball after scoring a goal.

- Number of goals in rapid resumptions of the ball;

**Material and method**

**The assessment** of the rhythm game will be based following criteria:

- Number of counterattacks (direct and indirect-finished or continue with the next phase of attack) made in a game and their duration, from the moment of possession of the ball till the will be thrown to the goal or continue with the next phase of the game;
  X = S as / No of counterattacks
- Number of rapid attacks (sustained counterattack) made in a game and their duration;
  X = S as / No of rapid attacks
- Number of rapid re-passes;
- Duration of positional attacks;
- Number of actions toward opponents / attack duration

The three-year analysis of a number of 225 games, have revealed that the best rhythm game was made by THV Kiel, at the club teams and Iceland, at the national teams, teams that made the biggest performance in those years (Championship League / third place to Beijing Olympics). Is not by chance, the coach of Iceland team from that time, is now the coach at THV Kiel.

To analyze the effectiveness of a rapid game, we followed:

- Number of goals in counterattacks or sustained counterattacks;

Dynamic and sustained rhythm of the game is not a scope in itself, but a means to obtain sports results.

Potential speed of our players was as follows:

- running on 25m
- designed to provide us with objective indicators of throwing balls complex in penetration
- dribbling and throwing ball complex to a fixed point.

Strategic priority since September 2009 is achieving a high efficiency in the practice of a dynamic game requiring players to maximum possibilities.

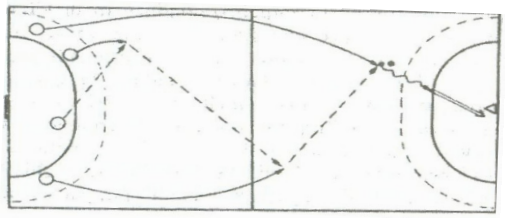
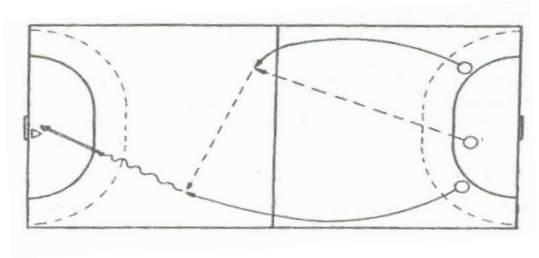


*Figure 1 Counter with intermediate and peak*



Requirements for obtaining a high index of speed of handball **players:**

a) Ability to speed in all its forms:

- Short travels (2-3 m to 30-40 m)
- Execution techniques with and without ball

The decision and response-engagement

b) Anaerobic resistance force, explosive strength, speed in all its forms.

c) Perfect technique and ability to execute rapid techniques

d) Perfect knowledge of the tasks within the game systems in attack and defense of their team and knowledge of game tactics of the opponents.

e) Mobilization and availability of the players for high-intensity efforts

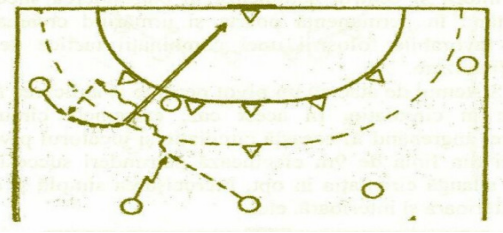


*Figure 2 Enveloping the inner*

A handball team needs both fast and strong players; handball is a game of physical contact between competitors. Usually, teams have players who play in speed (E and P), and players (I and P) who are strong, but not as fast. In this way, the coach has to consider that the players engaged in the defense position to be able to develop effective counterattacks and phase-II, and quick move to restart the game after receiving a a goal.

- Physical training will have a higher rate of anaerobic exercise (55-60%)
- Specific motile skills are learned at a level which allows their high-speed performance and maximum efficiency;
- Tactical training team oriented to quick passing from the defense position to attack (and vice versa) and to a high speed to realize tactical combinations;
- ability to make changes after 7-12 minutes of playing, in so manner that the homogeneity and value of the game to not be affected and the relationships formed during the game to be stable leading to increased efficiency;
- The team of players to be composed of .

A problem in dealing with these requirements is the attitude of the players who do not always accept the intense and constant efforts and that are making the difference for players with speed availability to others.

To increase the rhythm of the game I watched with preference following **preparation tasks:**

- Use counter-attack and rapid attack all the time during the game (it is easier to lower the rate, if the tactical situation requires)

- Use tactical skills for quick resumption of the ball into the game after every goal;

- Maintaining the high rhythm and in phase III of the attack, that in fact is replaced by the phase IV;

- Tactical combinations will be based on preparing a sustained rhythm of the procedures of catching and passing the balls while penetrate, routes of moves of the players and the balls well known by all players.

- Assuring defensive balance and tactical use of change for the defense phase;

Increase of the anaerobic effort versus aerobic and mixed effort;

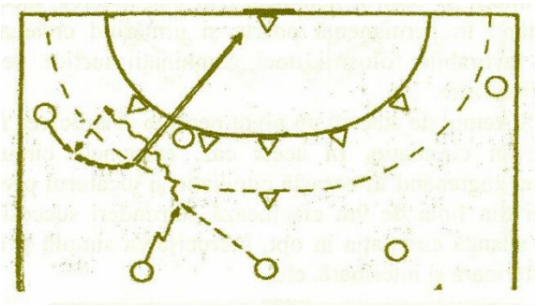


*Figure 3 Enveloping the inner*

In the conditions of a long absence of the Romanian team, from the big international competitions, an analysis of the performance potential of our players leads to the conclusion that the value of the individuals, ranks us 18-20 in the world. For this

we made a list of Romanian handball players on each position and their classification according to the following criteria:

- Eexecution level, the diversity and efficiency techniques
- The highest performance achieved by the team of club
- International experience at club and at the national team
- Sports value expressed in money (contract, annual income, etc.)

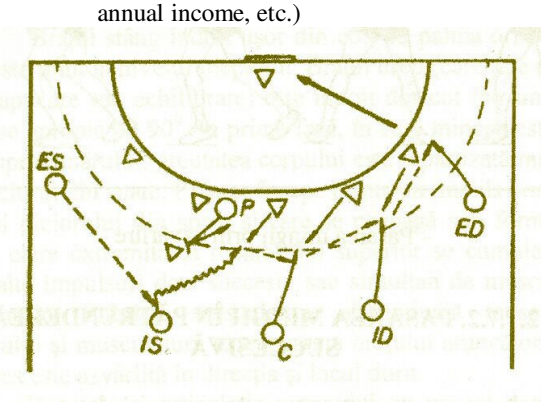



*Figure 4 Finish positional attack*

**Results and discussion**

Some of those questioned said that the need to play quickly all phases of the game, it is specific to the teams with little value, that have no chance of victory, and teams with players that value must impose that convenient rhythm to gain victory. This may be an explanation for the poor results obtained internationally by our club teams or by the national team. Also, the last fifteen minutes of national team games (and beyond) is poor, because of a high rhythm level required by the opponents with whom we fought playing at equal score, and even controlling the game to minute of 45-50; but we lost due to decrease in efficiency because of lack of training in increased rhythm.

**Premises** to increase the rhythm of the game

In the conditions of a long absence of the Romanian team, from the big international competitions, an analysis of the performance potential of our players leads to the conclusion that the value of the individuals, ranks us 18-20 in the world. For this we made a list of Romanian handball players on each position and their classification according to the following criteria:

- Eexecution level, the diversity and efficiency techniques
- The highest performance achieved by the team of club
- International experience at club and at the national team
- Sports value expressed in money (contract, annual income, etc.)

**Conclusion**

Under these circumstances, the main concern in developing a training program must improve the quality of speed of the all techniques, even if it leads to differentiated programs versus traditional programs. This can be achieved only through the knowledge of individual demands of each player, the formation of groups and individual application programs for players with speed abilities.

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# NEW ORIENTATIONS IN JUDO TECHNIQUE AND TACTICS

**Associate Professor Ion Ene Mircea[1], Ph.D**
**Associate Professor Roşu Daniel [2], Ph.D**
[1]University "Dunarea de Jos" Galati , [2]University of Piteşti

***Summary:*** *The present research intends, through the statistical analysis of points, penalties, and match dynamics at important competitions, in the framework of the regulations adopted by the International Judo Federation in 2010, to find the technical and tactical tendencies and implicitly the adaptation of the judoka to the new competitional challenges.*
***Key words:*** *referee, technique, tactics.*

**Introduction**

The amendments brought along the years to the regulations of organisation and performance of judo competitional activities aimed at increasing the dynamism, efficiency and spectacle of this sporting discipline, visible in the ever increasing number of practitioners, spectators and TV viewers at the official championships.

The new rules adopted by the International Judo Federation which are in force from January 1, 2010 to December 31, 2012 are experimental during the qualification for the Olympics in point of organisation, technique and tactics.

Thus, it is forbidden to use all direct attacks or one-handed or two-handed blocks below the waist.

The following are subject to regulations: the sie of kimonos, cross holds, leg holds in successive and counter-attack techniques, head passages under the opponent's arm, the refereeing system, the golden score and the actions detrimental to the spirit of judo.

**Hypothesis of research**

The analysis of the 2010 Judo competitions ( European Championships ) on age levels according to the data presented at the EJU Congress provide a vision of the efficiency of the measures adopted by the IJF for the desired orientation, and also the measures that the coaches are to take into consideration for the technical and tactical training of judoka.

**Purpose of research**

The present research aims at determining, through the statistical data analysis of points, penalties and match dynamics, the importance of the technical –tactical procedures in the context of the new regulations, and adapting, by extrapolation, to the new challenges of judoka training for the main competitions.

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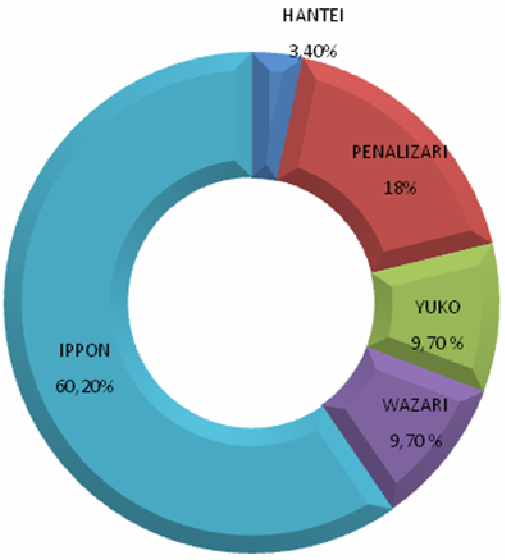
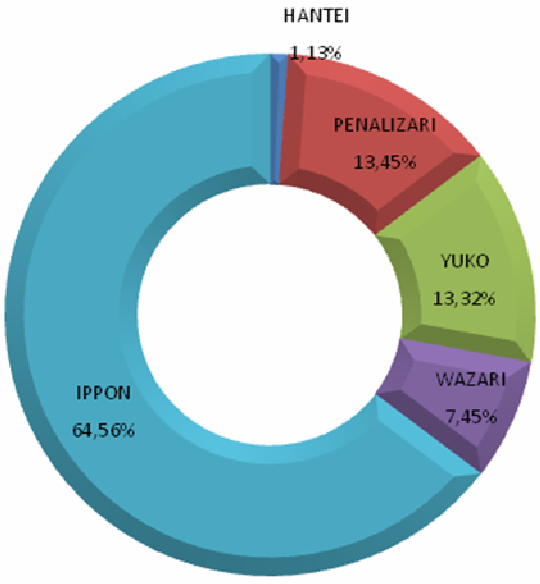
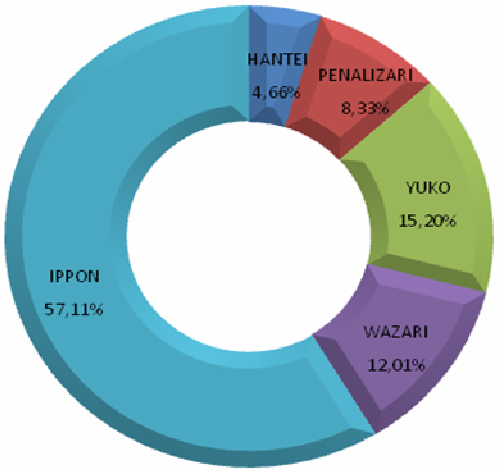


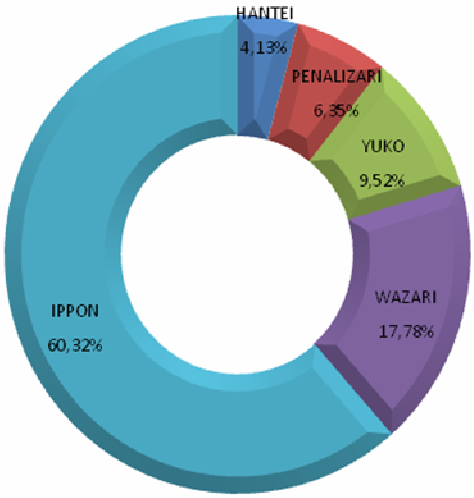

**2. E.C CADETS-TEPLICE / CZE 2010**



**3. EC JUNIORS - SAMOKOV / BUL 2010**




**4. EC U 23 SARAJEVO / BIH 2010**




**Observations on technique**

**Nage-waza (projection techniques)**

☯ the techniques of koshi-guruma and tai-otoshi are used again, due to the fight position and regulation kimonos;

☯ the frequency of ashi-waza and renzoku-waza techniques increases, due to the position of shizen-tai;

☯ maintaining the hold after projection is essential to proceeding with the ground fight.

**Ne-waza (ground fight techniques)**

☯ the immediate passage to the ground remains as important as before, both as tori, and as uke;

☯ today's refereeing system allows the extension of duration of the ground fight;

☯ new ground fight combinations have emerged;

☯ toketa is not to be mistaken for mate.

**Observations on tactics**

☯ a considerable number of matches end in ippon;

☯ decisive actions occur at the very first seconds;

☯ the physical training reaches very high levels;

☯ the sound knowledge of the refereeing rules and their use in the tactical approach of each opponent;

☯ the cross hold is still subject to debate.

☯ the number of matches ending in Hantei has increased.

**Observations on the refereeing system**

☯ the athletes have to decide the match;

☯ inactivity is not sanctioned on the spot;

☯ double penalty is avoided;

☯more time is allowed to ground fight, but not to be used as tactics;

☯ the number of matches that continue in Golden Score has increased.

**Conclusions**

These changes and alterations are necessary so that the image of judo could face the pressure from the International Olympic Committee regarding the adaptation of the Olympics programme to the requests of the sponsors who wish attractive, modern and interesting shows for spectators and TV viewers.

**Proposals for further research**

**The technique of judo will continue developing in the future on account of the following factors:**

☯ the continuous development of the individual technical skill;

☯ knowing and applying an ever greater number of technical elements and procedures, their association with individual peculiarities and using them skilfully in combat conditions;

☯ increasing the ability to freely and creatively associate the technical procedures allowing surprising, varied individual actions, benefiting from all the physical and mental resources;

☯ the increase of technical ability in ever changing conditions or moments of great responsibility for the designation of the winner;

☯ the tendency towards ambidextrous technical skill;

☯ the emergence of new variants of execution of the technical procedures acquired on the basis of special somatic and motor skills;

☯ modifying the motor structure and the execution rhythm of the technical procedures, depending on the combat situation;

☯ the increase of the efficiency of the technical procedures either by increasing the accuracy of the motor acts, or by their association;

☯ the technical skill characterises only athletes of a high technical ability acquired over time.

**In judo the following tactical development tendencies are stimulating factors of development:**

☯ imposing an inconvenient fighting manner for the opponent (holds, combat positions, faster executions, etc.);

☯ developing the athlete's ability to think and efficiently solve any combat situation, viz. forming the operational intelligence;

☯ increasing the athlete's ability to"mask" his real intentions (execution feints, false attack or attack doubling) in order to catch his/her opponent by surprise;

☯ a new quality and efficiency is assigned to individual tactical actions founded on high technical skill, motor skills (physical skills), somatic and mental skills.

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**Nouvelles tendances dans la technique et tactique du judo**

***Mots clé:*** *arbitrage, technique, tactique.*

***Résumé:*** *L'article essaie, par l'analyse statistique des points, sanctions et dynamique du match, dans le contexte du règlements adopté par la Fédération Internationale de Judo, d'établir les tendances techniques et tactiques et par extrapolation l'adaptation des judoka aux nouvelles demandes competitionnelles.*

# THE APPROACH OF THE KINETIC PROGRAM FOR HIPS WITH APPLIED ENDO-PROSTHESIS IN THE "LACU-SARAT BRAILA" RECOVERY CENTER (2007 – 20011)

**Dr.Viorica Lefter[1],**
[1] The Faculty of Medicine", The Faculty of Kinesiotherapy", Galati
**Dr. Andreea Oana Cibu[2],**
Medicine Faculty, Galati

**Abstract:** *Objectives. The objective of the present study is to relieve the necessity and the efficiency of the kinetic recovery of the operated hip, and to increase the orthopedist's trust in the kinetic act as a medical act executed in a responsible and understanding fashion by the qualified staff. Arthroplasty refers to the replacement of a joint deteriorated by a certain pathological process (degenerative arthritis, infection, or tumor) with an artificial one, named endoprosthesis, a joint which must remain perfectly functional. The material and the method. The lot comprised 76 (63%) mail patients and 45 (37%) female patients, 44 (37%) of which with ages between 40 and 60 years, 54 (45%) between 60 and 70, and 21 (18%) exceeded 70 years of age. The distribution of the study lot was made depending on the addressed symptomatology: chronic pain, acute pain and mobility reduction. Thus, 52 (42%) patients featured acute pain, 42 (33%) chronic pain and 35 (27%) mobility disorders accompanied by walk disorders, that is, tilting pelvis 67 (55%) and limping 54 (45%) (Fig. 3), (Fig. 4) with hip prostheses of different types and at various intervals from the intervention. Subjects were clinically, functionally, radiologically and MRI investigated, preoperatively, postoperatively, after 3 months and after 1 year. A recovery program featuring educational, hygienic, diet, medication and physical-kinetic aspects was applied daily for a 14 to 15-day period, followed by kinesiotherapy and massage 2 to 3 times a week, by reevaluation and by a complete treatment at 3 months and at 1 year, respectively. Monitoring was made by the VAS scale for pain, Womac Lequesne for the functional status and Tinetii for the walk. Results. All patients have been evaluated initially, after 10 days and at the completion of the treatment, after 3 months and after 1 year. The recovery of hip arthroplasty must be carried out in time and maintained for the entire life. Conclusions.. Hips with applied endo-prosthesis must present the same functionality as a normal joint. If mobility is restored by the very functionality of prosthesis as passive element, stability and walk require a 4-5 force musculature, values that can be obtained only through an analytical kinesiotherapy program for each muscle group. Due to the fact that the application of endoprostheses occurs between the ages of 60 and 80 years, the reeducation of the walk is slow, , and the fear of falling hinders the recovery, which is an issue with great impact on the quality of life.*

***Keywords:*** *kinetic recovery, arthroplasty, falling hinders.*

**Introduction**

Establishing the inferior train is conditioned by the structural-functional integrity of the neuro-myo-arthro-kinetic components. A special role in this sequence is played by the hip, the most important joint in the orthostatic stability and walk. In the prospective study we observed the results of the recovery program, evaluating the following parameters: pain, mobility, stability, the force of the stabilization musculature, walk and, respectively, quality of life in patients with operated hip.

Arthroplasty refers to the replacement of a joint deteriorated by a certain pathological process (degenerative arthritis, infection or tumor) with an artificial one, named endoprosthesis. As a rule, surgical treatment is required when the means of the applied preservative, accurate and intensive treatment fail. Surgical treatment depends on the decision of the surgeon, who establishes the type of prosthesis depending on the disease: coxarthrosis, aseptic necrosis (2), and hip arthroplasty (1).

*Treatment of pre-degenerative arthritis*: these forms are generally observed in patients before the age of 40, usually as consequences of some well defined causes and in the case of which architectural vices can be analyzed. 1) the orthoplastic stop; 2) the Pauwels variation osteotomy; the McMurray osteotomy (medially); 4) cervical osteotomy (Moore) – which always entails the risk of complications, the necrosis of the femoral head. (6)

*Confirmed coxarthrosis*: in establishing the indications of the surgical treatment of confirmed coxarthrosis various factors are involved. The real and the physiological age, the clinical-radiological form, the phase of the evolution and life and work conditions are highly important in choosing the surgical solution. 1) cup arthroplasty (Smith-Petersen); 2) the McMurray osteotomy with tenotomy; 3) total arthroplasty (McKee). (2)

*Cup prostheses* consist of preserving the femoral cervix and head to which a cup making articular contact with the acetabulum is fixed. One of the indications of this prosthesis is the ischemic necrosis of the femoral head. *Total prosthesis* is indicated in all the large anatomical-functional degradations of the hip: secondary and primary decompensated coxarthrosis; posttraumatic sequelae; cervix fractures with decayed acetabulum, aseptic necrosis, old hip dislocations; old arthrodesis executed at need at an early age and which is transformed in arthroplasty when the spine, the knee, the opposite hip can not functionally compensate the ankylosis of the hip; inflammatory chronic rheumatism, ankylosing spondylitis and rheumatoid polyarthritis; sequelae of infectious coxitis.

*Figure. 1. Types of hip orthopedic-surgical interventions (6)1bis*
*Figure. 1 bis. Resuming the walk by Botez (5)*

*The postoperative treatment in meant to:*

*1.Prevent profound venous thrombosis*: drug and kinetic treatment, adequate positioning.

*2.During* hospitalization, the initiation of recovery by maintaining mobility within the limits of prosthesis, akinetic muscular invigoration, isometry on different muscular groups and passive and active flexion angles (without rotation), all of them unburdened. Mobilization sitting down, resuming the orthostatic position and the walk according to the possibilities of loading and to the support means. Adapting the prosthetic means (frame, crutches, walking sticks).

*3. Home recovery or in specialized services is meant to resume walking*. The course of resuming the walk is the following: walking in place, followed by walking around the bed, walking around the house, walking on plane ground, walking on the stairs (with crutches, walking sticks, or without).

*4. Avoiding falls and the dislocation of the prosthesis by*: renewing the stability position by the means of free postures, fixed postures, invigoration of musculature, invigoration of hip abductor muscles, invigoration of the pelvic-trochanter, invigoration of the greater gluteal, of hip abductor muscles, of hip flexor muscles

*5. Resuming the walk (3)*

Exercises intended for resuming the walk begin with periods of adjustment to orthostatic position which, in general, is highly important in particular in the elder.

The moment standing up on both feet is possible without balance problems, the walk begins. 1. walking without leaning on the affected inferior limb; the patient walks with crutches; leaning on the healthy limb; the crutches are brought forward; the affected limb is brought forward between the crutches without burdening it (it touches the floor); the body weight is moved on the crutches by poising the body forward; the healthy inferior limb passes between the crutches and leans on the floor in front of the crutches, at the same time the body weight being moved from the crutches on the healthy limb.

In this phase of walking without leaning on the affected inferior limb, a few aspects are followed: the foot of the affected limb is not suspended in the air, but is put on the floor in virtual leaning; the extension of the hip during the posterior step must be completed; the knee must flex just as in the case of a normal walk; touching the floor with the affected limb, though relatively mimed, must be done accurately first by heel, than by rolling on and leaving the floor by toes; the poising of the affected limb, just as the virtual leaning, must be done without deviation (usually in abduction and external rotation); the rotation of the pelvis above femoral heads must be as symmetrical as possible during the pelvic step; the distance between the steps must be equal and constant (usually, the length of a step and a half). The patient is taught to go up and down on the stairs.

The patient must mount with the healthy limb, and then the crutches and the affected limb are brought on the same stair.

The crutches and the affected limb are brought down, and then the healthy limb is brought on the same stair.

1. The walk with leaning on the affected limb is resumed gradually, depending on the type of lesion.

2. The walk leaning on a walking stick begins when the patient has reached to a burdening of about 50% of the body weight and the pelvis does not poise (the Trendelenburg sign) due to the insufficiency of the abductor muscles. The walking stick is held in the *hand opposite to the affected limb*, and they move together. The burdening is graduated by loosening the leaning of the hand on the walking stick.

3. The complete recovery of the walk requires a series of complex exercises, such as: walking freely, walking on a slanted surface, walking back, walking sideways, walking with crossed legs, walking crisscross, and turnings.

During the leaning interval of each inferior limb, there are two phases: the cushioning phase and the impulsion phase.

*Fig. 2. Home mobilization (3)*

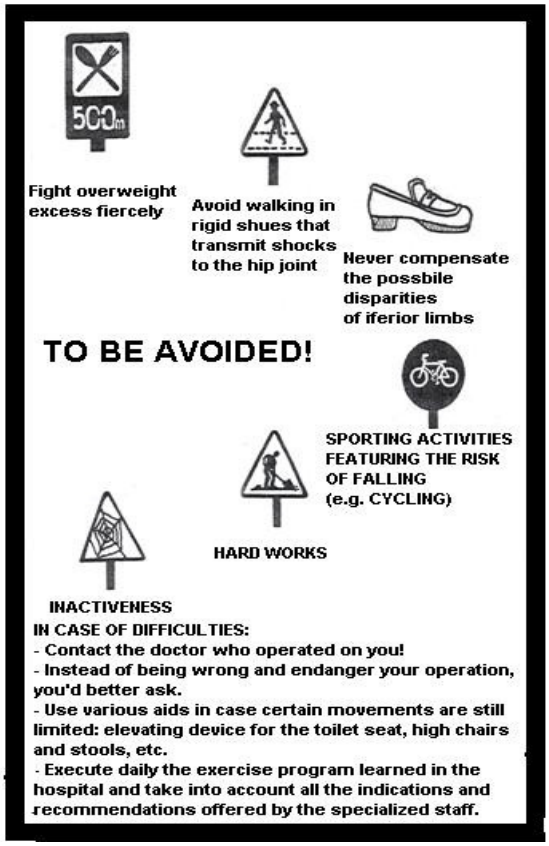


*Figure 3. Postoperativ precautions(3)*

*The orthopedic hygiene of the hip (6)*. Most of the hip traumas feature coxarthrosis as tardy sequela. The recovery of early sequelae must be complemented with a series of prescriptions that the patient will follow at home for months and years, sometimes for life. These prescriptions are part of what was called "hygiene of the hip": losing weight, even under the ideal weight; avoiding walking on bumpy ground and stairs; avoiding limping by the mental control of the walk; avoiding extended orthostatic position and walks; at least twice a day the patient will keep to resting in the bed, with the inferior limbs stretched; leaning on the walking stick on longer distances; daily riding a bicycle or a fixed bicycle; twice a day, the patient will execute the exercises prescribed for mobility and for muscle invigoration; legs will not be crossed; hips are not to be flexed more than 90 degreed; for a long postoperative period, a pillow is used between the inferior limbs in sideway decubitus.

**Objectives, purpose**. The present study intends to prove the efficiency of kinesiotherapy (by posturing, mobilization, invigoration, orthopedic hygiene of the hip) applied to a lot of patients having undergone the application of an endoprosthesis, in view of relieving pain, of improving mobility, stability, the walk and the socio-professional reintegration.**The material and the method**.



*Figure 4. Postoperative precautions.(2,3)*

The clinical study was carried out within the "Lacu Sarat" specialty Ambulatory and the S.C. "FIZITER" S.A. recovery Center on a lot comprising 121 patients, between April 2009 and April 2011. The lot consisted of

- 76 (63%) mail patients and
- 45 (37%) female patients,

With the ages between 40 and 60 years – 44 (37%) patients - 60 and 70 years – 54 (45%) patients – and exceeding 70 years – 21 (18%) patients.

The distribution of the study lot was made depending on the addressed symptomatology: chronic and acute pain and reduction of mobility. Thus,

- 52 (42%) patients featured acute pain,
- 42 (33%) featured chronic pain and
- 35 (27%) featured mobility disorders,

accompanied by walk difficulties: pelvic tilting – 67 (55%) patients and limping – 54 (45%). (Fig. 3) (Fig. 4)

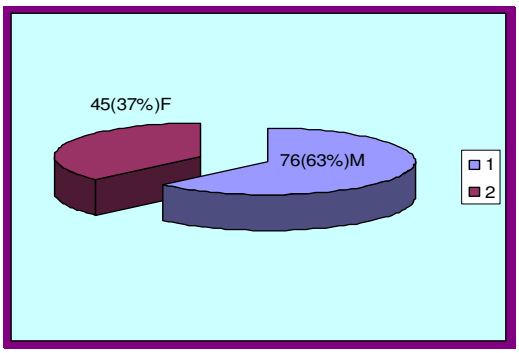


*Figure 1. The distribution of the study lot by sex*

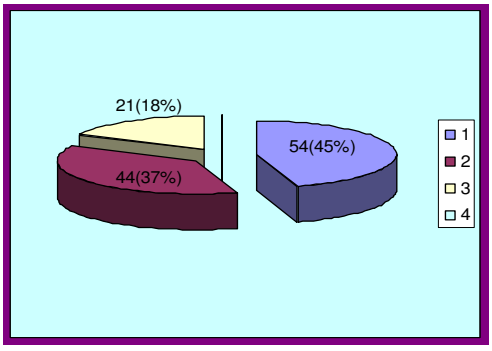


*Figure 2.The distribution of the study lot by age*

All patients having benefited by an initial subjective clinical exam (the VOS scale) and by an objective one (articular and muscular testing, measurements, evaluation of the walk), the Womac Index, the Lequesne functional Index, Tinetii for the walk, muscular testing for stability, articular testing for articular mobility. (2,3,5)

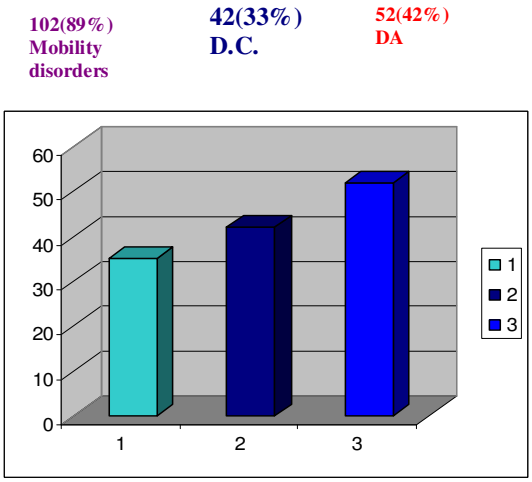


*Fig. 3. The distribution of the study lot depending on the addressed symptomatology: chronic and acute pain and reduction of mobility.*

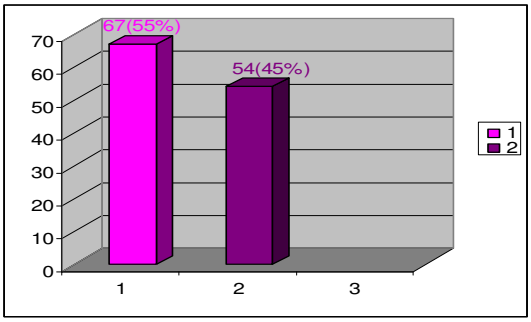


*Fig .4. The distribution of the study lot depending on the mobility disorders: pelvic tilting 67 (55%) and limping 54 (45%).*

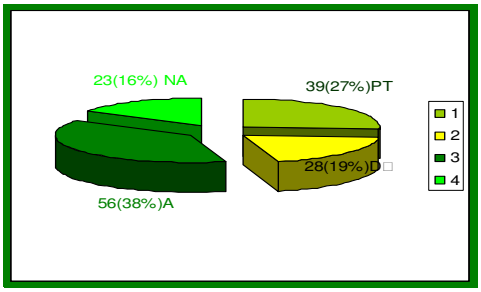


*Figure. 5. The distribution of the study lot depending on the operative indications*

Tests were carried out initially, at the beginning of each treatment, after 3 months and after 1 year.

Kinetic programs have been individualized depending on pain, on the remaining functional deficit, and objectives. They lasted 15 days and they comprised: balneotherapy in kinetic pools, antalgic and relaxation electrotherapy, massage, analytical kinesiotherapy,

simple psychotherapy in view of acknowledging the necessity of the kinetic program and abandoning various postoperative support means (crutches, frame, and walking sticks). The kinetic program was updated weekly.

The operative indications were intended for: degenerative arthritis – 56 patients (38%), femoral head aseptic necrosis – 23 patients (16%), posttraumatic sequelae – 39 patients (27%) from the total of study patients, hip dysplasia – 28 patients (19%) (Fig. 3). The purpose of this study was to determine whether, by applying kinesiotherapy through programs specific to each patient, a significant score increase is obtained, and whether there is a significant difference in score before and after the treatment. (Fig. 4)

The following clinical-functional parameters were observed: pain – evaluated by the means of the VAS scale (0-10), physical and functional dysfunctions, mobility, stability, Patrik +-, cognitive dysfunctions (the LOQUESNE, Womac scale), self-perception of the patient, drug consumption. Within the following graphics, the percentage evolution of the initial and final results for the parameters observed in the study will be presented. Is can be estimated that pain reduces significantly; thus, acute pain reduced from 42% acute pain to 32% after the first treatment, chronic pain reduced from 33% to 21%, mobility was enhanced from 89% to 36%. Improvements registered for the cognitive dysfunction was 86,39%.The self-perception of the patient concerning their health condition indicates an improvement of 64,4% (Graphic I).

*Table 1 .The evolution of the pain score.*

| Lot | erage scores itial – Final | Score fferences (I-F) | Statistic ignification, |
|---|---|---|---|
| 21 people | 2,54-0,58 | 96 (77,16%) | (over 0,001) |

*The evolution of physical dysfunctions.*

| Lot | Average scores I-F | ore differences (I-F) | Statistic signification, |
|---|---|---|---|
| 21 people | 7,98-1,59 | ,39 (80,07%) | P (over 0,001) |

*The evolution of cognitive dysfunctions.*

| Lot | Average scores I-F | ore differences (I-F) | Statistic signification, |
|---|---|---|---|
| 21 people | 1,69-0,23 | ,39 (80,07%) | P (over 0,001) |

*The evolution of the self-perception score.*

| Lot | Average scores I-F | ore differences (I-F) | Statistic signification, |
|---|---|---|---|
| 21 people | 1,77-0,63 | ,14 (64,4%) | P (over 0,001) |

*The evolution of the drug consumption score.*

| Lot | Average scores I-F | ore differences (I-F) | Statistic signification, |
|---|---|---|---|
| 21 people | 1,46-0,36 | ,10 (75,34%) | P (over 0,001) |

Drug consumption dropped from (74,34%) to (30, 49%).

The obtained results compare to the ones achieved by recently controlled studies. Analyzing the obtained data, we can sustain that the recovery program consisting of the mentioned kinetic program in the chapter "Treatment", accompanied by the use of natural treatment factors specific to the "Lacul-Sarat" resort, brings a significant improving of the observed parameters.

**Debate**. From the processed data, it follows that the participation to postoperative sequelae recovery is clearly superior in urban inhabitant, as compared to rural inhabitants; the addressed differences between the two sexes are to the advantage of mail patients; the study lot comprises people exceeding 50 years of age, the age criterion being insignificant. The obtained statistic results comply with the requirements of this study, that is: the kinetic recovery treatment applied for the purposes mentioned above allows a clearly significant score increase within the recovery program.

**Conclusions**

From the point of view of demographic factors, the lot is relatively homogenous. Applying the associated kinetic program in the recovery of dysfunctions produced by applying prostheses on the hip significantly reduces the monitored parameters, reduces pain, muscular contraction and retraction, it enhances mobility, the walk, it modifies patient's self-perception, cognitive dysfunctions and leads to the drop of analgesic and relaxation drug consumption, which is a beneficial phenomenon for the quality of life of the patient on the hip of whom an endoprosthesis has been applied, and for their professional and social reintegration.

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## Approche du traitement cinetique a la hanche endoprothesee au centre de recuperation, lacu-sarat, braila, -2009-2011

***Mots-clés**: douleur, le handicap, questionnaire, indice.*

***Résumé. Objectifs**.L'objectif de cette étude est de mettre en évidence la nécessité et l'efficacité de la récupération cinétique de la hanche operee, des premiers jours post-opératoires, d'accroître la confiance de l'orthopédiste dans l'acte cinétique comme acte médical, effectué par un personnel qualifié avec de la responsabilité et du discernement. L' arthroplastie signifiele le remplacement des articulations endommagées par certains processus pathologiques (arthrite, infection, tumeur) par une valvule artificielle appelé endoprothèse, l'articulation qui doit rester entièrement fonctionnel.**Matériel et méthodes.***

*. Le lot se composait de 76 (63%) hommes et 45 (37%) patients de sexe féminin. Les patiens étaient âgés entre 40-60 ans, 44 (37%) et 60-70 ans 54 (45%) et plus de 70 ans 21 (18%) . La répartition des groupes d'étude selon leurssymptômes : douleur chronique, aiguë et la mobilité réduite, a ete :52 (42%) douleur aiguë 42 (33%) douleur chronique et 35 (27%) mobilité réduite, accompagné d'une démarche anormale: basculement du bassin 67 (55%) et en boitant 54 (45%). (Fig. 3). (Fig.4) avec des types différents de prothèses de la hanche et à différents intervalles après la chirurgie. Les sujets ont été étudiés clinico-fonctionnelle (rayons X et IRM pré-opératoire, après la chirurgie à 3 mois et 1 annee. Ce fut un programme de rétablissement, d'éducation, d'hygiène, de diététique, médical et physique-cinétique, tous les jours temps de 14-15 jours, lors d'une cure suivie d'une thérapie physique et de massage 2-3 fois par semaine, suivi par une reexamination et par un traitement complet a 3 mois et a une annee. La surveillance a été fait par l'échelle EVA pour la douleur, WOMAC Lequesne pour le statut fonctionnel et Tinetii pour la marche.*

***Résultats.*** *Tous les patients ont été initialement évalués, à 10 jours et à la fin de la cure de 3 mois et 1 an .. Les paramètres suivis ont été favorables, en particulier pour les patients qui se sont présentés immédiatement après la chirurgie. La récupération de l'arthroplastie de la hanche doit être faitependant une periode de temps determinee et maintenue pour tous viața.*

***Conclusions.*** *La stabilité du train basse est conditionnée par l'intégrité structurelle et fonctionnelle des composantes de la neuro-myo-artro-cinétique. Une hanche avec endoprothèse doit fournir les mêmes fonctionnalités comme une articulation normale. Si la mobilité est donnée par la prothese-même comme élément passif la stabilité et la marche nécessite des muscles à force de 4-5, des valeurs qui peuvent être obtenus seulement grâce à un programme de thérapie physique analytique de chaque groupe. Parce que l'endoprothèse survient à des âges 60-80 ans la rééducation de la marche est lente , les engrammes motrices sont beaucoup ralentis, et la peur de l'échec freine la récupération ; ce sont des questions influant la qualité de vie.*

# KINETIC AND NUTRITIONAL APPROACH OF THE OBESITY. (STUDY)

**Dr.Viorica Lefter[1],**
[1] The Faculty of Medicine", The Faculty of Kinesiotherapy", Galati
**Dr. Andreea Oana Cibu[2] ,**
Medicine Faculty Galati

***Abstract:*** *Obesity. Definition. It is a pathological condition caused by the nutrition or endocrine function disorders that disturb the equilibrium between the caloric contribution and the body's energetic losses, highlighted by excess body fat uniformly or localized in particular body regions. (1) Types of obesity: first appearance; 1. hyper plastic – develops typically in children who are over-nourished.*

*2. Hypertrophic obesity – develops after the age of 18 -20. Etiopathogeny; I. endogenous factors; genetic predisposition 80% of 2 parents, 50% 1 parent, constitutional predisposition II. Exogenous factors (over-nourishment, 80%-90%). Incidence: OMS (1997)"obesity outbreak, USA 36%, Central Europe 15-20%, Eastern Europe 40-50%, Romania 20-25% of the population. There's an increase in obesity incidence that goes for women and for those aged over 40. (2) Clinical examination. 1. weighing 2. Measurement of skin fold thickness 3. Girth 4. BMI calculation. Material and method. The research was made during September 2009-2011, in Lacu-Sărat Resort and ,,Sc Fiziter SRL" Medical Recovery Centre in Braila. The study batch was split in two sub-batches, that is a witness batch A made of 57 women patients (41%) that benefited only from the diet, calculated after the daily energetic consumption and who did not want to take part in the group kinetic and home programs and an experimental group B, made of 81 women patients (69%) that benefited both from the diet and the kinetic programs. The kinetic programs were personalized based on the kinetic possibilities of each case. The followed parameters were: BMI, waist girth, weight and which have been tested weekly, but for the study they have been previously estimated (initially, intermediary and finally). Results: The waist evolution reduced from 95 cm to 87 cm, from 120 cm to 99 cm and from 148 cm to 139 cm respectively with 7,5 cm to 24,5% of the patients, with 11 cm to 54,5% of the patients and with 9 cm to 19,5% of the patients. A flexibilization of the people involved in the study has*

*been noticed, a bigger ability in movements both in the gym and in daily life. The overweight BMI that started the study were initially in the percentage of 24,3% and at the end of the study they were 42,6%, the reason being the persons that entered the category from the obesity and extreme obesity studies. The obesity percentage reduced from 54, 4% to 37, 6% at the end of the study. The extreme obesity percentage reduced from 19, 3% to 17,8 %. The weight control is a compulsory step in the obesity monitoring. We obtained: 1. Weight loss 2. 5 kg. (14%) 2. Weight loss. 5-8 kg.(16%) 3. Weight loss 10-12kg. (21%) 4. Weight loss 12-15 kg. (26 %) 5. Weight loss 15-20-kg. (9%) 6. Insignificant fluctuations – statistically (14%). Conclusions. The therapy consists in the optimization of the life style, respectively a low calorie diet and regular physical activity, behavioral therapy, specific medication and motivation. These methods apply differently, starting with the weight loss phase and the maintenance phase, according to the objectives.*
***Keywords**: kinesitherapy, caloric contribution, IMC (BMI.)body mass index.*

**Introduction**

**Obesity. Definition.** It is a ***pathological condition*** caused by the nutrition or endocrine function disorders that disturb the equilibrium between the caloric contribution and the body's energetic losses, highlighted by excess body fat uniformly or localized in particular body regions. (1) Types of obesity: first appearance; 1. hyper plastic – develops typically in children who are ***over-nourished. 2. Hypertrophic obesity – develops after the age of 18 -20. By body shape % - low body obesity – increase of the body mass with over 15%*** more ***than the ideal body weight; average obesity - increase of the body mass with over 20%*** more ***than the ideal body weight; big obesity - increase of the body mass with over 30%. By the fat settlement we have: "gyno*** type" – the fat accumulates on the belly and hips area, "android type" – the wrist line disappears, "the general type" **Etiopathogeny**; I. endogenous factors; genetic predisposition 80% of 2 parents, 50% 1 parent, constitutional ***predisposition*** II. Exogenous factors: ***Over-nourishment***, 80%-90%). Number of meals, sole meal had in the evening, alcohol consumption, sedentariness, stress, psychical trauma (7,40% for women and 10% for men). Incidence: OMS (1997)"*obesity outbreak, USA 36%, Central Europe 15-20$, Eastern Europe 40-50%, Romania 20-25% of the general population.* There's an increase in obesity ***incidence that goes for women*** and for those aged over 40. Clinical examination**.** 1. Weighing 2.

***Measurement***s of skin fold thickness 3. Girth 4. BMI – In order to calculate the overweighting and the obesity we can use the IMC (Body Mass Index) or BMI (Body Mass Index) that can be made using the formula: BMI (kg / meters²) = body mass (kg) / height (in meters²).

The internationally BMI values accepted are presented below in (:table 1) the DIAGNOSIS is based on the weight excess.

Body Fat Settlement. Peripheral oedema. Effort dyspnoea. Pains in the over-stressed joints. Differential diagnosis: Couching Symptom, Hypothyrodism, Hyperinsulism, Lymphedems,

Evolution. 1. The 1st stage is dynamic and characterized by polyphagia and lipogenesis. 2 The 2nd stage is static, the body weight settles and complication soon arrive.

**Complications:** Metabolic, respiratory, osteoarticular, fatty infiltration of the liver, atherosclerosis, hypogonadism.

**Prognostic:** Life expectancy is 10 years shorter than for the rest of the population. The obesity management is presented in table 2.


*Fig.1.Obesity*

*Table 1*

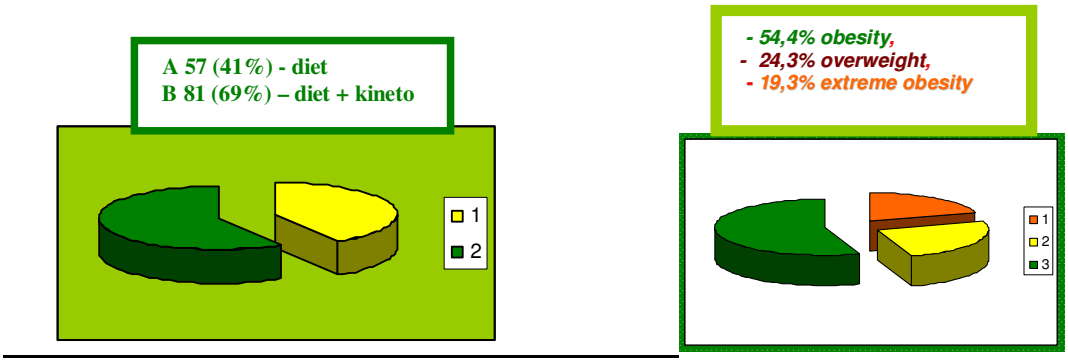
| | |
|---|---|
| **Underweight** | **< 18.5** |
| **normal** | **18.5-24.9** |
| **Overweight** | **25 - 29.9** |
| **Obesity** | **30 -39.9** |
| **Extreme Obesity** | **> 40** |

*Table 2 - THE CLINICAL MANAGAMENT OF OBESITY* (5)

| OBJECTIVES | PRINCIPLES | METHODS |
|---|---|---|
| **5-10% weight loss per cycle,** | **Realistic and adjusted objectives** | **Therapy:**<br>**- optimizing the lifestyle,**<br>**- behavioral therapy,**<br>**- pharmacotherapy (medication, nutritional supplements)** |
| **Maintenance** | **Initial approach: I$^{st}$ cycle**<br>**- loss / maintenance** | **Therapeutic education** |
| **Prevention of refall** | **Continuous approach: succession of loss / maintenance cycles** | **Monitoring** |
| **Control:**<br>**- of FRCV (cardio / vascular risk factors),**<br>**- of complications** | **The simultaneous control of risk factors and of obesogenic mechanisms** | **KINESIOTHERAPY** |
| **Quality of life** | **NEGOTIATION, motivation** | **Evaluation** |

**Organizing and developing the research**

The research was realized on a 138 subject lot (women) with weight problems, of various ages and affection degrees, between September 2007 and 2009, in the Lacu Sarat resort and the "SC Fiziter SRL" Medical Rehabilitation Center, Braila. The study lot was divided into 2 sub-lots, that is, a witness lot A, comprising 57 (41%) female patients benefiting only from different forms of diet, still calculated depending on the daily calories consumption, patients who did not want to participate to group and home kinetic programs, and an experimental lot B, comprising 81 (69%) female patients benefiting from both different forms of *diet* and *kinetic programs*, established depending on the physical features of each case (graphic I).




*Graphic 1. The structure of the study lot*

Within this period we have realized 3 tests on the subjects (initial, intermediary (once a month) and final, after 6 months), observing the evolution of each case and elaborating new exercise programs adjusted to patients' receptivity to the initially enforced kinetic programs.

Lot A has benefited from the same diets: 1) test diet, 2) 1400-calory diet, 3) 1500-calory diet, 4) 1600-calory diet, 5) 1800-calory diet. For the experimental lot we have structured the loss weight program as follows: 14-day metabolic test diet; diet depending on the energy consumption, on age, sex, according to the table; initiation kinetic program; low difficulty kinetic program; average difficulty kinetic program; high difficulty kinetic program; reevaluation after 30 days; short, medium and long term programs, depending on possibilities. Depending on the degree of obesity, on the established objectives and on the personal features, we have recommended the following diets: 1) diets with 1800 kcal less than the previous diet, which can lead to a weight loss of 0,5-1kg / week, 5-10 kg within 3 months (about 5-10% of the initial weight); 2) diets with 1600 kcal less than the previous diet, followed by a weight loss of 1-2 kg / week (about 20% of the initial weight), recommended for increased and extremely increased risk patients; 3) standard low calorie diet of 1500 kcal / day, which requires the recommendation of and the monitoring performed by the doctor specialized in diabetes, nutrition, metabolic disorders; highly low calorie diets, 1400 kcal / day, which lead to an obvious and rapid weight loss, but which does not lack side effects, reason for which this type of diet has specific indications, being applied only for a short period of time no longer than 1-2 months, and only under the supervision of specialists in diabetes, nutrition, metabolic

disorders. There is no scientific proof with respect to the superiority of various commercial diets or of the dissociated ones, reach in proteins and low in sugars. Moreover, this type of diets can be accompanied by negative effects on the organism, reason for which they are, if so, recommended under the strict supervision of recognized specialists in nutrition.

Within the weight maintenance period, the low calorie diet will be able to be complemented with 200-300 kcal, provided that physical exercises are intensified, so the energetic balance remains negative. Kinetic programs have been individualized depending on the kinetic possibilities of each case.

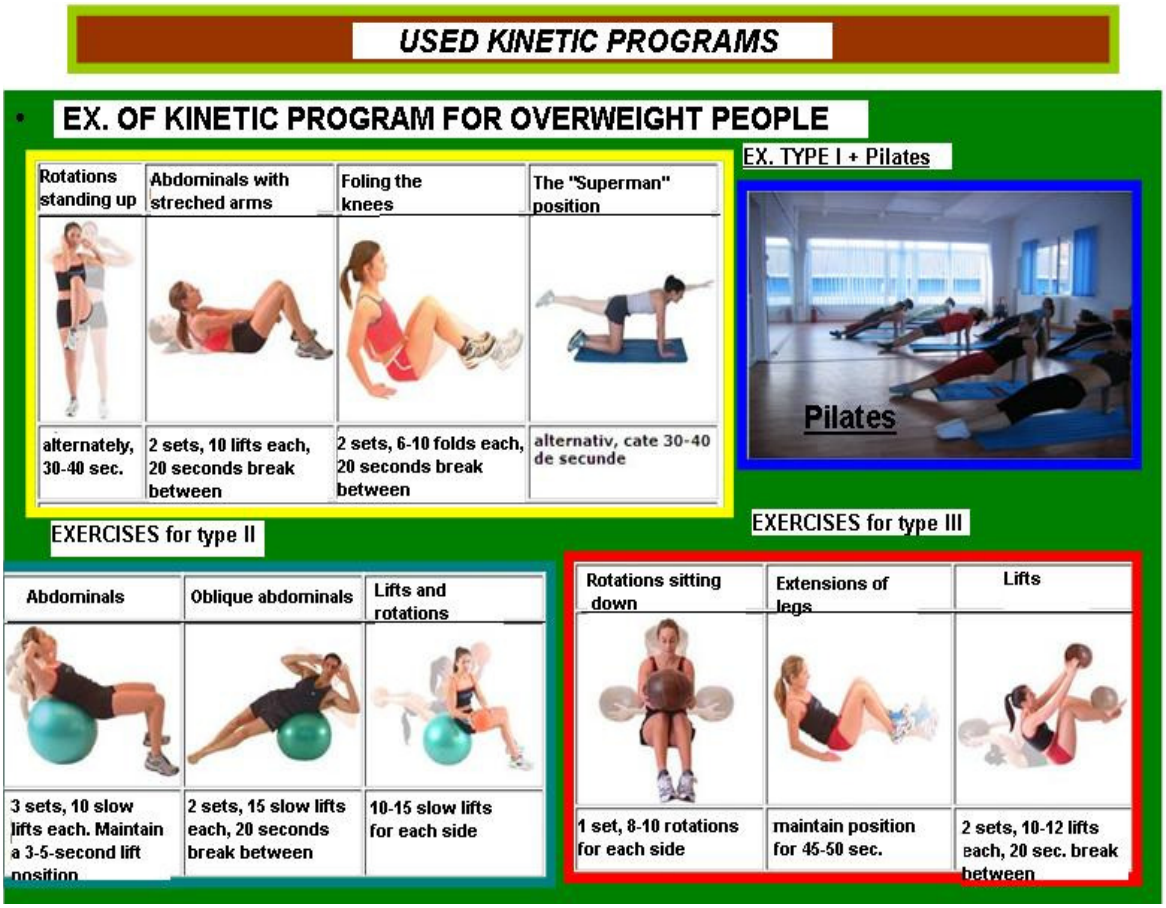



*Fig 2. Used kinetic programs. (6)*

**Monitored parameters:** The monitored parameters were: IMC, girth, weight. The parameters have been tested weekly, but for the study they were estimated (initially, intermediary, and finally).

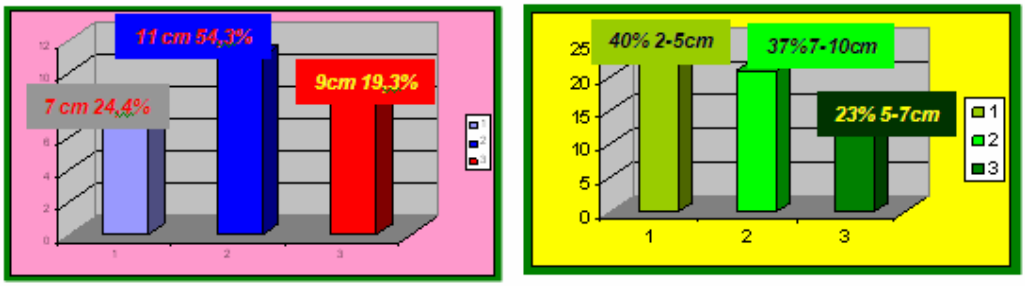
The program also included a study on motivation (initially and finally).

Kinetic programs have been individualized depending on the kinetic possibilities of each case. For instance, for beginners, Pilates, Type I low difficulty exercises; for cycles 2-3, Types II, III average and high difficulty exercises (Fig. 2).

At the beginning of the treatment cycle, the featured motivation had a percentage of 76,1%; during cycles, it maintains high in people having results in therapy, and it presents monthly fluctuations; motivation decreases progressively in people with unsatisfactory results who present even periods of depression. At the end of the cycles, motivation increases in people who have changed their way of life.

**Evolution of girth dimensions**

Following the applied treatment, girth dimensions are the first to modify, sometimes in the absence of modifications in weight. The evolution of girth varied between 1,95 cm-12cm, and a decrease of more than 12 cm occurred in 12 cases. Girth reduced from 95 cm to 87 cm, from 120 cm to 99 cm, and from 148 cm to 139 cm, respectively, with 7,5 cm in 24,5% of the patients, with 11 cm in 54,5% of the patients, and with 9 cm in 19,5% of the patients. The flexibilization of people and their increased ability in movement were ascertained, both in gym and in their daily life.

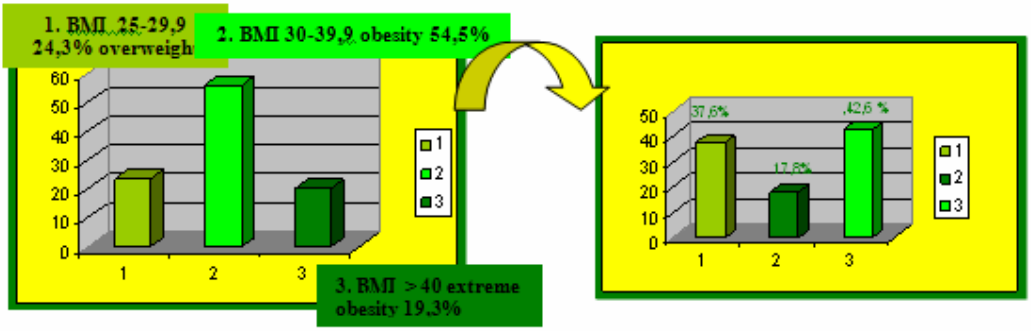



*Graphic 2. The evolution of girth in the study lot, the witness lot*

The evolution of girth in the witness lot (57): 13 patients (23%) reduced their girth with 2-5 cm, 23 patients (40%) reduced it with 5-7 cm, and 21 (37%) patients reduced it with 7-10 cm.

In order to measure overweight and obesity we can use the BMI indicator (Body Mass Index), which is calculated as follows: body mass (kg) / height (m²). BMI values modify the slowest during the evolution of the study lot. For the accuracy of the study, we have verified BMI at the beginning and at the end of each cycle.

Statistical reference values are the initial and the final ones. If, initially, upon entering the study, overweight people yielded a percentage of 24,3%, at the end, the percentage mounted up to 42,6% by undertaking obesity and extreme obesity. The obesity percentage reduced from 54,4% to 37,6% at the end of the study. The percentage of extreme obesity reduced from 19,3% to 17,8%. There has been abandonment during the study, but other people have entered the study, so the percentage remained the same. Following at least 3-5 cycles within a year, the statistically significant differences as compared to the witness lot upon which only the diet treatment was applied were as shown (graphic II).

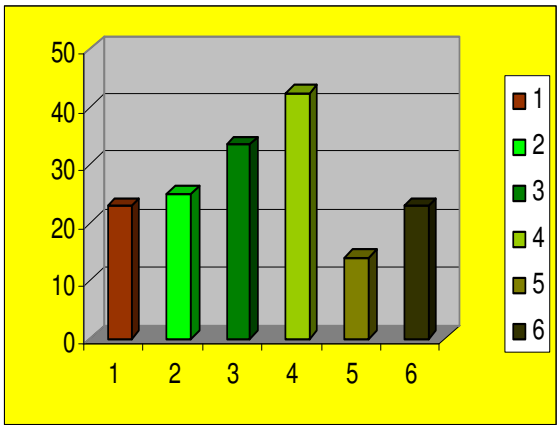



Graphic 3. The evolution of initial and final MBI

*Weight control, an imperative step in monitoring obesity*

We have obtained weight loss gradually, with one or more "weight loss – maintenance" cycles. This strategy of approaching obesity is based on the succession of "weight loss – maintenance" cycles. A cycle of this kind, during the weight loss phase, was meant to decrease weight cu 5-10%, objective realized in 3-6 months, followed by a 3-6-9-month new weight maintenance period. The cycles have been repeated until the established optimum weight was attained

**1. 2-5kg. (14%) weight loss**
**2. 5-8 kg. (16%) weight loss**
**3. 10-12kg. (21%) weight loss**
**4. 12-15 kg. (26%) weight loss**
**5. 15-20-kg. (9%) weight loss**
**6. (14%) statistically insignificant fluctuations**



*Graphic 4. The evolution of weight in study lot*

The study lot benefited from a 3-week test diet, during which 89% of the female patients lost at least 4 kg, subsequently to which the personal sheet of each patient containing the diet type (no. of admitted calories according to the type of effort of each person) was drawn, obtaining the values shown in graphic III. The personal sheet was adapted from weight loss / maintenance cycle to weight loss / maintenance cycle.

**Conclusions**

**The basic principles of clinical management of obesity are:**

1) Continuous intervention, with short and long term echeloned objectives, periodically and individually adjusted.

2) Close collaboration with the obese person with respect to establishing the objectives and the therapeutic methods according to clinical parameters, monitoring, and periodical evaluation.

3) Gradual weight loss, with one or more "loss – maintenance" cycles. This strategy of approaching obesity is based on the succession of "weight loss – maintenance" cycles. A cycle of this kind consists of a weight loss phase, the objective of which is the decrease of weight with 5-10% attained in 3-6 months, followed by a 6-9-month new weight maintenance period. The cycles can be repeated until the optimum established weight is attained.

Long term objectives should be the obtaining of normal weight, that is, the weight corresponding to a BMI < 25 kg/m². In reality, this objective is very difficult to realize and, in particular, to maintain. This is why it is considered that the most realistic long term objective is the maintenance for at least 2 years of the new weight obtained subsequently to the weight loss phase.

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**Approche cinetique et nutritionnelle de l'obesite etude**

***RÉSUMÉ : Mots-clés:*** *thérapie physique, l'apport calorique, l'indice de masse corporelle. IMC (BMI)*

***Obésité***. ***Définition***. *L'obésité est un état pathologique du à la perturbation de la fonction de nutrition ou de la fonction endocrine, ce qui perturbe l'équilibre entre l'apport calorique et les pertes d'énergie du corps, état qui est attesté par les dépôts excessifs de graisse, uniformes ou localisés dans certaines régions du corps (1).*

*Les types d'obésité: après l'apparition; 1. l'hyperplasie représente le début de l'obésité ; elle est caractéristique aux enfants suralimentés. 2. hypertrophie-commence après 18-20 ans.*

***Etiopathogénèse*** *; I des facteurs endogènes ; la prédisposition génétique de 80% des deux parents, 50% d'un parent ; la prédisposition constitutionnelle II. des facteurs exogènes (la suralimentation, 80% - 90%).****1.L'incidence****: OMS (1997), l'épidémie d'obésité, 36% aux États-Unis, 15-20% en Europe centrale, en Europe orientale 40-50%, en Roumanie 20-25% de la population générale. L'incidence est plus élevée chez les femmes et après 40 a .****2)L'examen clinique****. 1 pesage 2 mesurage de l'épaisseur du pli cutané 3. circonférence 4 . le calcul de l'IMC.* ***Matériel et méthodes.***

*La recherche a été menée sur un échantillon de 138 sujets (des femmes) avec des problèmes de poids, de différents âges et de différents degrés d'obésité, pendant la période Septembre 2009 - 2011, dans la station "Lacul Sarat "(Le Lac Salé) et le Centre de récupération médicale, Sc Fiziter SRL, Braila. Le groupe d'étude a été divisé en deux sous-lots, c'est a dire un groupe de contrôle temoin A, composé de 57 (41%) patientes qui n'ont pas voulu participer à des programmes cinétique de groupe et à la maison et qui ont reçu seulement un régime alimentaire, ayant la consommation d'énergie calculée quotidiennement, et un groupe expérimental B, composée de 81 (69%) patients ayant reçu les deux programmes alimentaires et l'énergie cinétique. Les programmes cinétiques ont été individualisés en fonction des possibilités cinétiques de chaque cas. Les paramètres suivis ont été : IMC, la taille, le poids ont été testés chaque semaine, mais , pour l'étude , ont été estimés (au point initial, intermédiaire et finale).*

***Résultats:*** *On a réduite le tour de taille de 95cm à 87 cm, de 120cm à 99cm et de 148cm à 139cm, respectivement de 7,5 cm à 24,5% des patients, avec 11cm à 54,5% des patients et 9 cm à 19,5% des patients. On a constaté une perte de poids considerable pour toutes les personnes, tout comme une plus grande capacité de mouvement, tant dans le gymnase et dans la vie quotidienne. Initialement, les IMC surpoids était de 24,3% , finalement le pourcentage atteint 42,6% en prenant l'obésité extrême et l'obésité.*

*Le pourcentage d' obésité est passée de 54,4% à 37,6% à la fin de l'étude. Le pourcentage de l'obésité extrême est passé de 19,3% à 17,8%.Par le contrôle du poids, étape obligatoiredans le contrôle de l'obésité, nous avons obtenu: 1. La perte de poids. 2-5 kg. (14%) 2. La perte de poids. 5-8 kg. (16%) 3. La perte de poids. 10-12 kg. (21%) 4. La perte de poids. 12-15 kg. (26%) 5.. La perte de poids 15 à 20 kg. (9%) 6. Des fluctuations statistiquement négligeables (14%).*

***Conclusions****. La thérapie consiste en optimiser le style de vie, respectivement par un regime allimentaire modérément hypocalorique, par une activité physique régulière, par une thérapie comportementale,par les médicaments spécifiques et par la motivation. . Ces méthodes sont appliquées différemment dans le processus de perte de poids et de la maintenance, et, surtout, en fonction des objectifs.*

# QUANTITATIVE AND QUALITATIVE ANALYSIS ON FINAL 4 CHAMPIONS LEAGUE 2010/2011

**Benedek Florian**[1]
**Leuciuc Florin**[1]
[1]University "Stefan cel Mare" of Suceava

***Abstract:*** *The aim of the study is to analyze quantitative and qualitative the evolution of the teams in Final 4 EHF Male Champions League. The study was structured in the folowing sections: introduction, material-method (approach that leaves the premises in the study), results (presents analysis results on the qualitative and quantitative components) and discussions (presents the final conclusions of the study). As average every attack lasted more than 30 seconds, being 431 attacks in 4 matches, that means 107,75 attacks per match. There were scored 224 goals, as average 56 per game means an increase of attack's duration and slow pace of the game. Of the total of 224 scored goals, 197 were shot on positional attack and 27 on counterattack, the number of the counterattack scored goals representing less than 12% of the total goals.*
***Key words****: handball, male, Final 4, EHF Champions League, quantitative and qualitative analysis.*

**Introduction**

The aim of the study is to analyze quantitative and qualitative the evolution of the teams in Final 4 EHF Male Champions League.

This study took as benchmark the data of special literature, data regarding the minimum shots'efficiency (Taborsky F., 2001; Hergeirsson T., 2009; Abramovic Z., 2010; Pollany W., 2011):

- Efficiency of the whole team in attack:60%
- Backcourt: 40 – 45%
- Wing: 55 – 60%
- Central part of 6 m line: 60 – 65%
- Counterattack: 70 – 75%
- 7 m shots: 75 – 80%
- Attacks without shots: 15 – 20%
- Goalkeepers: 35 – 40%

In analyzing the evolution of the teams in Final 4 EHF Male Champions League there were used the observation method (direct observation method or simply watching the matches) and the statistical-mathematical method, having as support statistics provided by the organizers through websites of the competition and of the European Handball Federation.

The study was structured in the folowing sections: material-method (approach that leaves the premises in the study), results (presents analysis results on the qualitative and quantitative components) and discussions (presents the final conclusions of the study).

The 2010/2011 competitive season of the EHF Male Champions League has brought some changes in the playing schedule as follows: the preliminary round, groups stage (4 groups each counting 6 teams), last 16, the quarterfinals and the Final 4 (including the semifinals, the bronze medal match and the final).

The competition following this schedule counted four teams that passed to Final 4: Rhein Neckar Lowen (Germany), F.C. Barcelona (Spain), Renovalia Ciudad Real (Spain), HSV Hamburg (Germany).

**Material-method**

Cologne (Germany) hosted this stage of the competition on 28th – 29th of May 2011. Each team played two matches and the results were:

- Match no. 1 semifinal: Rhein Neckar Lowen – F.C. Barcelona 28-30;
- Match no. 2 semifinal: Renovalia Ciudad Real – HSV Hamburg 28-23;
- Match no. 3 Bronze medal match: Rhein Neckar Lowen - HSV Hamburg 31-33;
- Match no. 4 Final: F.C. Barcelona – Renovalia Ciudad Real 27-24.

The teams participating in this tournament are significant for the European club handball in terms of performance.

Rhein Neckar Lowen it's a top team in German handball Bundesliga and in european competition had good results: finalist in Winner's Cup in 2008, semifinal in Champions League in 2009, quarterfinal in Champions League in 2010.

F.C. Barcelona won 17 times Spanish Championship and the same times Spanish Cup. F.C. Barcelona is the record winner of the Champions League (six titles) and one time former Champions Cup. Also they won five times the European Cup Winners and once the European Cup.

Renovalia Ciudad Real won both Spanish Championship and Spanish Cup five times. On the international level they won two times the Winner's Cup, four times the EHF Champions Trophy, once World Champion of club teams and three times EHF Champions League.

HSV Hamburg in last 5 seasons in German hanbdall Bundesliga won once championship (2011), twice finished in second place and two times in third place. In european competition played in final round of the Champions Trophy (2007), finalist in Winner's Cup in 2007, two times semifinalist in Champions League (2008, 2009), quarterfinal in Champions League in 2010.

**Results**

After a quantitative analysis of Final 4 matches, I could do some assessments.

Rhein Neckar Lowen scored only 59 goals of a total of 129 attacks, having an efficiency of 45.74%. In Table 1 we notice that the 9m line efficiency was very weak (32.08%) and on the counterattack there were scored only 3 goals of a total of 6 attacks.

As for goalkeepers (Table 2), they could save no 7m shot, respectively poor efficiency for the shots of the central part of 6m line. Their efficiency was a weak one because they blocked only 26 shots of a total of 89 (29.21%).

The team lost the two matches due to its technique lacks of both defensive and offensive.

*Table 1 Attack's efficiency Rhein Neckar Lowen*

| Team Shots | Goals | Saved | Missed | Post | Blocked | Total | % |
|---|---|---|---|---|---|---|---|
| **6m Shots** | 16 | 4 | 1 | 0 | 0 | 21 | 76.19 |
| **Wing Shots** | 12 | 7 | 5 | 0 | 0 | 24 | 50.00 |
| **9m Shots** | 17 | 19 | 11 | 1 | 5 | 53 | 32.08 |
| **7m Shots** | 6 | 2 | 1 | 0 | 0 | 9 | 66.67 |
| **Fast Breaks** | 3 | 3 | 0 | 0 | 0 | 6 | 50.00 |
| **Breakthroughs** | 5 | 1 | 1 | 0 | 0 | 7 | 71.43 |
| **Totals** | 59 | 36 | 19 | 1 | 5 | 120 | 49.17 |
| **Attacks without shot** | 0 | 0 | 0 | 0 | 0 | 9 | |
| **Totals** | 59 | 36 | 19 | 1 | 5 | 129 | 45.74 |

*Table 2 Goalkeepers' efficiency Rhein Neckar Lowen*

| Goalkeepers | Total Shots | | 6m Shots | | Wing Shots | | 9m Shots | | 7m Shots | | Fast Breaks | | Breakthroughs | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | S/S | % | S/S | % | S/S | % | S/S | % | S/S | % | S/S | % | S/S | % |
| **Totals** | 26/89 | 29.21 | 1/16 | 6.25 | 7/13 | 53.85 | 14/32 | 43.75 | 0/6 | 0 | 2/16 | 12.5 | 2/8 | 25 |

HSV Hamburg had a good efficiency in attack on all game posts (Table 3) but with a large number of actions wasted by 9m line (21 actions) of which 14 in the first game and adding the weak efficiency of goalkeepers in the same game (29%), the result was an unfavorable one (Table 4). Better performance in the second match led them to getting the bronze medal.

*Table 3 Attack's efficiency HSV Hamburg*

| Team Shots | Goals | Saved | Missed | Post | Blocked | Total | % |
|---|---|---|---|---|---|---|---|
| **6m Shots** | 14 | 6 | 0 | 0 | 0 | 20 | 70.00 |
| **Wing Shots** | 7 | 5 | 2 | 0 | 0 | 14 | 50.00 |
| **9m Shots** | 13 | 14 | 4 | 1 | 2 | 34 | 38.24 |
| **7m Shots** | 8 | 1 | 2 | 1 | 0 | 12 | 66.67 |
| **Fast Breaks** | 9 | 3 | 3 | 0 | 0 | 15 | 60.00 |
| **Breakthroughs** | 5 | 2 | 0 | 4 | 0 | 11 | 45.45 |
| **Totals** | 56 | 31 | 11 | 6 | 2 | 106 | 52.83 |
| **Attacks without shot** | 0 | 0 | 0 | 0 | 0 | 8 | |
| **Totals** | 56 | 31 | 11 | 6 | 2 | 114 | 49.12 |

*Table 4 Goalkeepers' efficiency HSV Hamburg*

| Goalkeepers | Total Shots | | 6m Shots | | Wing Shots | | 9m Shots | | 7m Shots | | Fast Breaks | | Breakthroughs | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | S/S | % | S/S | % | S/S | % | S/S | % | S/S | % | S/S | % | S/S | % |
| **Totals** | 32/91 | 35.96 | 4/18 | 22.2 | 7/21 | 33,33 | 17/34 | 50 | 0/2 | 0 | 2/5 | 40 | 2/10 | 20 |

Renovalia Ciudad Real was victorious in the first match, but defeated in the second. The lacks of the team's strategy consisted of low efficiency of 9m line (38.71%) (Table 5), no efficiency in blocking the shots of the central part of the 6m line and that affect the goalkeepers' efficiency (Table 6).

*Table 5 Attack's efficiency Renovalia Ciudad Real*

| Team Shots | Goals | Saved | Missed | Post | Blocked | Total | % |
|---|---|---|---|---|---|---|---|
| **6m Shots** | 9 | 3 | 0 | 0 | 0 | 12 | 75.00 |
| **Wing Shots** | 11 | 4 | 0 | 3 | 0 | 18 | 61.11 |
| **9m Shots** | 12 | 14 | 2 | 2 | 1 | 31 | 38.71 |
| **7m Shots** | 7 | 1 | 0 | 0 | 0 | 8 | 87.50 |
| **Fast Breaks** | 8 | 1 | 1 | 0 | 0 | 10 | 80.00 |
| **Breakthroughs** | 5 | 1 | 0 | 1 | 0 | 7 | 71.43 |
| **Totals** | 52 | 24 | 3 | 6 | 1 | 86 | 60.47 |
| **Attacks without shot** | 0 | 0 | 0 | 0 | 0 | 6 | |
| **Totals** | 52 | 24 | 3 | 6 | 1 | 92 | 56.52 |

*Table 6 Goalkeepers' efficiency Renovalia Ciudad Real*

| Goalkeepers | Total Shots | | 6m Shots | | Wing Shots | | 9m Shots | | 7m Shots | | Fast Breaks | | Breakthroughs | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | S/S | % | S/S | % | S/S | % | S/S | % | S/S | % | S/S | % | S/S | % |
| **Totals** | 33/86 | 38.37 | 4/14 | 28.57 | 3/12 | 25 | 18/35 | 51.43 | 2/8 | 25 | 3/10 | 30 | 3/7 | 42.86 |

F.C. Barcelona was the team that won the Final 4 in this tournament and the analysis of the match confirms a high efficiency of all posts in attack (Table 7) and also of goalkeepers (Table 8).

*Table 7 Attack's efficiency F.C. Barcelona*

| Team Shots | Goals | Saved | Missed | Post | Blocked | Total | % |
|---|---|---|---|---|---|---|---|
| **6m Shots** | 9 | 1 | 0 | 1 | 0 | 11 | 81.82 |
| **Wing Shots** | 10 | 3 | 0 | 0 | 0 | 13 | 76.92 |
| **9m Shots** | 21 | 12 | 3 | 4 | 2 | 42 | 50.00 |
| **7m Shots** | 4 | 0 | 1 | 0 | 0 | 5 | 80.00 |
| **Fast Breaks** | 7 | 0 | 0 | 1 | 0 | 8 | 87.50 |
| **Breakthroughs** | 6 | 4 | 1 | 1 | 0 | 12 | 50.00 |
| **Totals** | 57 | 20 | 5 | 7 | 2 | 91 | 62.64 |
| **Attacks without shot** | 0 | 0 | 0 | 0 | 0 | 5 | |
| **Totals** | 57 | 20 | 5 | 7 | 2 | 96 | 59.38 |

*Table 8 Goalkeepers' efficiency F.C. Barcelona*

| Goalkeepers | Total Shots | | 6m Shots | | Wing Shots | | 9m Shots | | 7m Shots | | Fast Breaks | | Breakthroughs | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | S/S | % | S/S | % | S/S | % | S/S | % | S/S | % | S/S | % | S/S | % |
| **Totals** | 41/93 | 44.09 | 6/15 | 40 | 6/16 | 37.5 | 20/31 | 64.52 | 5/11 | 45.45 | 3/11 | 27.27 | 0/7 | 0 |

Representing in charts and tables the attack's efficiency and the goalkeepers' efficiency is very relevant and suggestive for the results achieved in these four matches of the tournament and for the final ranking (figure 1 and 2, table 9).

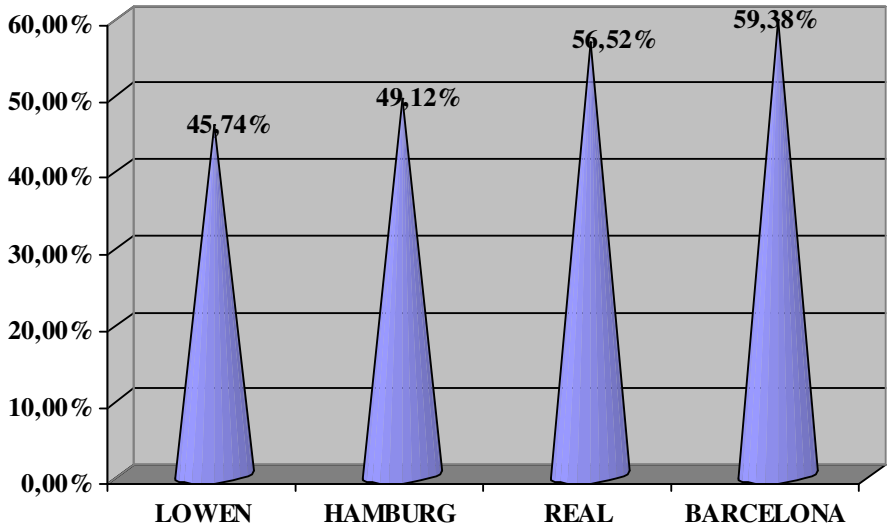


*Figure 1 Attack's efficiency for each team (2 matches)*

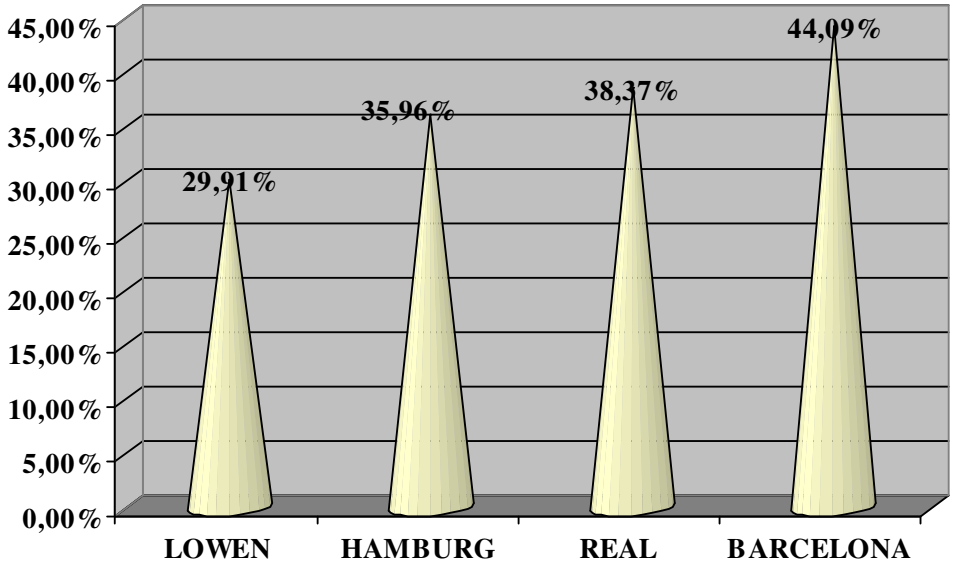


*Figure 2 Goalkeepers efficiency for each team (2 matches)*

*Table 9 Efficiency by teams*

| Parameters / Teams | Rhein Neckar Lowen Place 4th | HSV Hamburg Place 3rd | Renovalia Ciudad Real Place 2nd | FC Barcelona Place 1st |
|---|---|---|---|---|
| Efficiency of attacks with shots (%) | 49.17 | 52.83 | 60.47 | 62.64 |
| Goalkeepers' efficiency (%) | 29.21 | 35.96 | 38.37 | 44.09 |
| Attacks' efficiency (%) | 45.74 | 49.12 | 56.52 | 59.38 |
| Goal average | 59-63 | 56-59 | 52-50 | 57-52 |

**Discussions**

As average every attack lasted more than 30 seconds, being 431 attacks in 4 matches, that means 107,75 attacks per match. For this tournament the average attack time was 33.4 seconds.

There were scored 224 goals, as average 56 per game means an increase of attack's duration and slow pace of the game.

Compared to last year's competition the average number of goals scored per game was poor, below 60, exactly 56 per game.

Situation is even more interesting because the team ranked 4th (Rhein Neckar Lowen) has scored highest number of goals – 59, followed by competition winner FC Barcelona with 57 goals, HSV Hamburg (3rd place, 56 goals) and Renovalia Ciudad Real (2nd place, 52 goals).

Of the total of 224 scored goals, 197 were shot on positional attack and 27 on counterattack, the number of the counterattack scored goals representing less than 12% of the total goals.

The 9m line had a major contribution – 63 goals (28,13%); the central part of the 6m line had 48 goals (21,43%), the wing had 48 (21,43%) and 25 goals were scored on 7m shots (11,16%).

Analysing the scored goals, we could notice the importance of the 9m line, but also it shows us that the number of goals scored on counterattack is lower than the general result obtained by the teams.

Most of the teams had one or two their defense specialists and changed those players in defense and attack without having problems. One of the reasons can be that teams have been improving the fast retreat phase. In many matches both teams did the same and didn't pressure each other when changing players in defense/attack.

There were situations that some of defense specialists had joined their team in fast breaks or extended fast breaks before changing with attacker after estimating the possibilities for success. They tried to prevent opponent to make the defense/attack change and make a good shooting position at the position of the non-changed player.

The players demonstrated quick perception and rapid decision-making. In defence play, the players responded not only to their opponents but exhibited anticipation and took active control of the game.

One-to-one offence play generally led to paired and three-player offence combinations and turned into dynamic offence sets.

In play set-up in attack the most common offensive actions were drawings, crossings, transitions from wings and different variations of cooperation the back players and pivots, depending of opponents defense formation.

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# STUDY REGARDING USE OF PLYOMETRICS MEANS IN TRAINING PROCESS OF JUNIOR FOOTBALLERS AT 16 - 18 YEARS

**Manolache Gabriel**[1], Lecturer PhD,
**Talaghir Laurentiu-Gabriel**[1], Lecturer PhD,
**Mereuță Claudiu**[1], Lecturer PhD,
**Iconomescu Teodora Mihaela**[1], Assistent PhD
1. The Faculty of Physical Education and Sports Galati, "Dunarea de jos" University

***Abstract***:
*Football game requires from the practitioners many qualities such as speed, posibility to realise direction changes or necesity to performing various jumps imposed by the concrete situations of the game. All this requires an adequate specific training.*
*Pliometric type training has great potential for developing this type of explosive force, which is necesary in several sports.*
*In this paper we wanted to study methodological aspects of using frequently of pliometrice exercises in training process, to improve force in speed way, necessary to conduct to effective jumping.*
***Key words***: *Plyometric means, specific training, football, jumping, strength, speed, stretching exercises.*

**Introduction**

Plyometric training is specific work for the enhancement of explosive power. It is a training method to be used in conjunction with other power development methods in a complete training program to improve the relationship between maximum strenght and explosive power( Dragnea A. 1991; Radulescu M.,2009).

In most athletic events there is seldom enough time to develop maximum strength which takes 5 to 7 sec. Most explosive movements do not take that long. Therefore the premium is on generating the highest possible force in the shortest period of time and reducting or stopping this force at the end of the action.

With this objective plyometric training as well as rehabilitation programs. Scientific research has given us a fundamental understanding of the elastic properties of muscle and it's trainability ( Komi P.V., 1992; Semidtbieicher D.,1985).

This has enabled the practitioner to more effectivelly apply plyometrics. There have been many exorbitant claims as well as much undeservered blame for injury and overtraining. I will attempt to clear up some of the myths and misconceptions by explaining factors that will help in more effectve design and implementation of plyometric training.

Players can change direction or jump, most effectvely by using the same principles as outlined above for speed off the mark. They must lower the body and use a vigorous leg extension to drive towards the directions they wish to go ( Nicu A.,1993; Dragan A. 2006).

The scientific researches and practice prove that the stretching means are an accessible way towards both physical and muscle development of young players football. The muscle contraction and stretching have each three phases: the medium phases, the intensive and the maximum ones ( Anderson B., 1993).

**Purpose**

Training exercises-(3 series x 25 jump) x 2 rep, H= 40cm, two footed jump.Hold landing for two seconds and then repeat in reverse direction. Bounding for distance: start bounding in place and slowly increase distance with each step, keeping knees high. Bounding in place: jump from one leg to the other straight up and down, progressivelly increasing rhythm and height.

Behind this program and after training with plyometric exercises we aplicated the stretching exercises. This, are today often encountered, being called muscular stretching.

*Table 1*

| Initial test | Control group X ± m | Experiment group X ± m |
|---|---|---|
| Vertical jump | 40,10 ± 0,12 | 41,12 ± 0,14 |
| Bounding in place | 56 ± 2,01 | 60 ± 1,48 |
| Broad jump | 2,25 ± 0,16 | 2,37 ± 0,12 |
| Jump on single leg | 25,3 ± 2,13 | 26,2 ± 1,23 |

**Methods and research**

In the testing method we chose eight means jump showing the evalution of leg power. Mathemathical statistics methods were used to high degree of certainty what is the difference between the results obtained by the two groups and ehether these results are important. Graphic representation was used the play as synthetic developments of the two groups involved in research.

**Content and results**

For that, we made an initial test which wanted to mark out what was the level of training power of legs. The events on which they were tested are included in the region team football system of evaluation for this age. The test was made on two groups of football players, one being the control group and the other the experiment group, the results obtained on this test are reprezented in chart number 1.

Other tests or jump is: Cone jump-double leg jump with feet together. Jump side to side over cones quickly. Repeat forward and backward. Hop, Hop stick- single leg hop, stick second landing for 5 sec. Increase distance of hop as technical improved.

Jump into bounding- two footed broad jump, land on single leg, then progress into bounding for distance. Mattress jumps- twofooted jump on mattress, tramp, or other easily compressed device. Perform side to side and back to front.

The program of training plyometric exercises is:

Week 1- wall jumps 20 sec: tuck jumps 20 sec; broad jump stick land 5reps.;double leg cone jump 30sec/30sec (side to side then back to front); 3 series x 25 jump) x 2 rep, H= 40cm; bounding in place, 20sec.

Week 2- wall jumps 30 sec: tuck jumps 30 sec; broad jump stick land 10 reps.;double leg cone jump 30sec/30sec (side to side then back to front); 3 series x 25 jump) x 2 rep, H= 40cm; bounding in place, 30sec.

Week 3- wall jump, 30 sec; tuck jump, 30 sec; vertical jump, 5 reps; bounding for distance, double leg cone jumps, 30 sec/30sec.

Week 4- wall jump, 30 sec; tuck jump, 30 sec; vertical jump, 5 reps; bounding for distance, double leg cone jumps, 30 sec/30sec; hop, hop stick 5 reps/leg x 2 rep.

Week 5- wall jump 30 sec; step, jump up, down, vertical 5 reps; mattress jumps 30sec; single leg jumps distance 5 reps/leg; jump into bounding 3 runs;

Week 6- wall jump 30 sec; step, jump up, down, vertical 10 reps; mattress jumps 30sec; single leg jumps distance 10 reps/leg; jump into bounding 5 runs.

Prior to jumping exercises stretching-12min-15min, skipping 2laps.

After trainig-cool down walk 2 min, stretching 12 min-muscular stretch (20 sec with everything group muscular training). The results of these tests are presented in table no.2.

*Table 2*

| Final test | Control group X ± m | Experiment group X ± m |
|---|---|---|
| Vertical jump | 45,10 ± 0,15 | 50,12 ± 0,13 |
| Bounding in place | 59 ± 2,14 | 68 ± 1,38 |
| Broad jump | 2,40 ± 0,26 | 3,37 ± 0,14 |
| Jump on single leg | 28,3 ± 2,13 | 30,2 ± 1,23 |

However, the experiment group recorded a progress of 35% in the same event, representing an increase of two and half times higher than the control group which represented the team media in championship. This confirm the fact that the plyometrics exercises training in 6 weeks , the developement of power to legs by practicing stretching exercises complex fully favors their developement.

A progress of 15, 5% recovered by the control group can be seen in the broad jump event. By comparing these final results and the recorded progress of the two groups you can see that the results is superior in the case of the experiment group.

**Discusions and conclusion**

The study conducted found that the targeting of power leg to plyometrics exercises is a attent weeks programing (minim 6) and the rezistence of leg is give to stretching training.

We belive that this program is beneficial for the training football players, age 16-18.

After analysis and training test, it can be said that stretching exercises also performed even when the aim is to develop the velocity or strength, before some plyometric exercises or even at the beginning or ends of wearisome training.

The results of the experimental group are significantly better than those abtained from the control group, which makes us abble to appreciate than, the introduction of a program with simple exercises jumps, aimed at developing strenght power of leg and change of direction have a positive effects.

Without this program or exercises the time of consolidate a power and rezistance of leg is very deficiency.

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## Etude sur l'utilisation des exercices plyometriques dans le processus du developpement des footballeurs juniors ages de 16-18 ans

***Mots-clés**: signifie pliometrice, une formation spécifique, le football, le saut, la force, la vitesse*

***Résumé:***

*Le jeu de football exige aux sportifs des qualités telles que la vitesse, les changements de direction ou l'accomplissement des sauts variés, imposés par les situations concrètes de jeu. Tout cela nécessite une préparation adéquate.*

*L'entraînement plyométrique présente un potentiel élevé pour le développement de la force explosive spécifique à plusieurs disciplines sportives.*

*Dans cette étude, nous voudrions approcher les aspects méthodiques de l'utilisation fréquente des exercices plyométriques lors de l'entraînement, en vue d'améliorer la force en régime de vitesse, nécessaire à la réalisation des sauts efficients.*

# TEACHING DESIGN OF EXTRACURRICULAR ACTIVITIES

**Assistant Ph.D Susana Marinescu**
University of Târgoviste Walachia

***Abstract**: One of the major objectives of the educational process is to attract students to school activities such free time- extracurricular – based on sport, their initiation into the practice of organized sport, training and participation in sports competitions. In whole sports lessons, students are initiated with knowledge, skills, motor skills, which can help them to practice independently that sport, and sports training is aimed to maximize their sports skills and their interests. This form of activity sportive - recreational, like any activity that aim to achieve certain objectives, should have a rigorous design and organization of content, of strategies and means used in the training lesson, exploitation of human and material resources for gifted children such activities.*
***Keywords:** extracurricular activities, teaching design, skills, teaching strategy, teaching content, objectives.*

Practice forms of exercise in the school are provided by the national curriculum - education plan of the core curriculum framework and school decision activities: hour of physical education, optional hours and extracurricular activities – overall sports

These extracurricular activities are forms of sporting - recreational activity, conducted mainly outside the school time, in children's free time, aimed primarily at preparing them and make them to participate in competitions, but involve them in leisure activities and in an organized and educational time, valuing their intellectual potential, their skills and developing their competitive spirit to.

Having an opened character, extracurricular lessons from the school system are focused on "collective hours of sport", "overall sports", which are organized in groups of 12-15 students from different classes, and are based on the child's choice rather than by selection, by accepting those who wish to initiate and refine a sport.

Activities are developed at the initiative of the school, based on options of its students, parents, teachers, the capitalization of existing materials, of school tradition etc., requiring more careful rethinking of their educational content.

We can say that these activities role to play physical exercises for educational and recreational purpose, but also with a strong emphasis on sports training process, teachers must anticipate the needs of children, searching, finding and developing forms and attractive, and diverse programs, which can be adapted to the curriculum requirements in order to obtain better performance for most students and their personality development.

Reform taking place in Romania at present, requires a design activity based on knowledge and "creative action" of the teacher, as an objective necessity of long life learning perspective [3].

Designing teaching, one of the essential activities of teachers as an expression of pedagogical and methodological culture of the teacher, offers to all teachers the opportunity to assert their creativity in leading activities with children.

Today, the concept of design is wider, being expressed and characterized from other related concepts, such as: instructional design, and knowledge taxonomy.

Design is the act of anticipation and preparation of teaching and education based on a system of operations, training resulted in differentiated groups of subjects included in the idea of increasing their performance. It is a necessary and useful working tool, attention centred on the design falling "beneficiaries" - students. [3]

Designing a lesson "training", extracurricular type, in our case, a group of basketball-boys, is not only going through an algorithm procedures, but is also an innovative personal development opportunity, depending on context, knowledge, skills, motivations.

Efficiency the lesson is determined by how are set: objectives, resources, content, and evaluation strategies.

Naturally, if well-meaning to ask: What we offer to those children which are involved in extracurricular educational process type to satisfy their requirements and needs to move, to make them actively participate in this activity?

How could we do to achieve the expected result and providing feed-back? This requires the preparation and teaching thinking in terms of curricular reform approach, resulted in its exposure draft form type teaching curriculum - global, intermediate, and operational, to prevent improvisations.

Thus, some authors - [2, 4], promoting an algorithm which correlates four essential questions procedures for draft operational lesson curriculum, in the following order: *What will I do? What will I use? How will I do? How will I know if what was done to be done?*

The answers to four questions outlined stages of design staff.

The first question concerns the educational objectives to be set and achieved, second sends the educational resources available or educator should have, the third question requires an answer on developing a strategy for achieving educational goals, and answer the fourth question shows establish a methodology for evaluating the effectiveness of activity.

So put the problem in sport there is obvious need to establish objectives that are consistent with the requirements of all education, level of aspiration, motivation of children and why not of parents. This training requires a progressive organization and planning with systematic steps required by age and gender characteristics of students, to operationalize the educational objectives, formative and instructive.

Organization and content of sports lessons should provide technical and tactical knowledge and skills to practice sport in our case, the game of basketball, both leisure and for the presence of talented items for sports performance.

Design extracurricular activities, given their different character activity in the classroom, in terms of management, as a teaching activity, must be based and built on permanent interdependence of teaching - learning - evaluation (by competition).

The training process from these hours of sport activities are after sports training classes, organized by groups close to the training. However, hours of work involved and less gifted students in terms of sporting qualities, activity taking place on inhomogeneous groups, which requires careful design work based on subjects included in the group, and use the most effective means and methods that correspond to their level.

From this perspective, the introduction of the lessons extracurricular games of movement, relays, technical and tactical actions undertaken in the form of competition (teams formed according to demand), exercises in "School ball", a play on the field reduced 2x2-themed games without dribbling, basketball game of rugby ball, the game of Korfball (with novelty for them), a basketball game "horse", the game of basketball with the use of one hand, building games by itself, in partnership conducting exercises, conduct heat as a "game", the management of certain times of the lesson by "leaders", etc. - are all instruments (ways) to stimulate the creative potential of children, motivate active participation in such activities.

For an active participation of students is necessary for the teacher to take care that the information you transmit by means of education can be easily seen.

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**Activités d'enseignement de conception parascolaires**

***Mots clés:*** *activités parascolaires, la conception pédagogique, des compétences, stratégie d'enseignement, les contenus d'enseignement, les objectifs*

***Résumé:*** *Des objectifs majeurs du processus d'éducation est d'attirer les étudiants vers les activités scolaires telles gratuitement - extra - caractère sportif, leur initiation à la pratique du sport, de formation organisées et la participation à des compétitions sportives. L'ensemble des leçons de sport, les étudiants sont initiés aux connaissances, les compétences, les habiletés motrices, avec lequel ils peuvent pratiquer de façon indépendante que la formation sportive et le sport vise à faire des compétences sportives et de leurs intérêts. Cette forme d'activité sportive de loisir - comme toute activité qui visent à atteindre certains objectifs, devrait être donnée une conception rigoureuse et d'organisation des contenus, les stratégies et les moyens utilisés dans la leçon de formation, le matériel de présentation et de ressources humaines pour les enfants surdoués de telles activités.*

# STUDY ON THE INFLUENCE OF BMI AND PI ON THE ENERGETIC AND CONTROL PARAMETERS

**Claudiu Mereuță, Laurențiu Gabriel Talaghir,**
**Gabriel Manolache, Elena Mereuță**
**"Dunarea de Jos" University of Galati**

***Abstract:*** *The paper presents the results of the regression analysis for the influence of two indices, body mass index and ponderal index on the energetic and control parameters for a group of 12 girls, studying physical education and sports, aiming to reveal if these two parameters have any effect on their physical preparation.*

***Keywords****: energetic parameters, control parameters, body mass index, ponderal index.*

**Introduction**

Estimating the level of physical preparation is one of the most important tasks that one trainer has to accomplish. There are many way to achieve that goal, and that is why the trainer must choose the most appropriate one. As many tests provide information which is often distinctive, we must bring out a method that can be generally applied and that can offer individual results, independent from any other influence.

The method that we propose for this study is the MGM 15 method which is more appropriate for our goal, because it provides the energetic and control parameters for each participant, allowing the trainer to develop specific programs for each athlete.

**The energetic and control parameters**

The test develop by Bosco was the starting point for the MGM 15 test, which consists of a series of 15 vertical jumps, first on both legs and then on the right and left leg. A group of sensors measures the time on the ground and the time on air and a computer connected to a special carpet will provide the desired parameters.

The energetic parameters considered in this study are the unit power (UP), the average flying height (AFH) and the repetition velocity (RV). The unit power measures the muscular power per body mass and offers information on the force and velocity of the athlete. The average flying height offers information on the force developed during physical effort. Finally, the third parameter, the repetition velocity describes mostly the velocity of the neuromuscular processes.

The control parameters, namely CVE and CVS provide information on the way the body prepares for the ground contact.

A group of 12 girls was tested using this protocol and the computer supplies the magnitude of these parameters, together with other additional parameters (table1).

*Table 1 The energetic and the control parameters*

| | | Participant | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| BL | UP | 3.66 | 2.89 | 2.71 | 4.97 | 3.78 | 3.51 | 3.56 | 1.94 | 2.41 | 3.76 | 2.49 | 2.57 |
| | H_flight | 0.22 | 0.15 | 0.12 | 0.38 | 0.25 | 0.17 | 0.22 | 0.1 | 0.13 | 0.25 | 0.09 | 0.16 |
| | V-rep | 0.24 | 0.23 | 0.19 | 0.21 | 0.21 | 0.18 | 0.2 | 0.26 | 0.26 | 0.22 | 0.15 | 0.26 |
| | CVE | 65.23 | 77.5 | 79.61 | 2.44 | 3.29 | 80.8 | 2.72 | 50.2 | 60.3 | 2.51 | 77.56 | 7.06 |
| | CVS | 4.77 | 12.5 | 33.91 | 5.11 | 4.92 | 11.1 | 7.32 | 39 | 6.82 | 8.54 | 52.09 | 5.85 |
| | Tsolm | 0.22 | 0.2 | 0.01 | 0.19 | 0.19 | 0.15 | 0.18 | 0.01 | 0.24 | 0.19 | 0.01 | 0.24 |
| | Hmax | 0.36 | 0.27 | 0.22 | 0.42 | 0.28 | 0.34 | 0.25 | 0.19 | 0.24 | 0.29 | 0.18 | 0.2 |
| | Pmax_r | 4.61 | 3.87 | 4.79 | 5.17 | 4.07 | 4.65 | 3.77 | 4.37 | 3.43 | 4.16 | 4.25 | 3.03 |
| | Pmax_p | 4.64 | 3.95 | 4.92 | 5.33 | 4.1 | 4.94 | 3.87 | 4.57 | 3.47 | 4.26 | 4.46 | 3.04 |
| RL | UP | 2.67 | 1.67 | 1.29 | 3.25 | 1.99 | 2.95 | 1.69 | 1.05 | 1.71 | 1.9 | 2.33 | 2 |
| | H_flight | 0.16 | 0.11 | 0.07 | 0.24 | 0.12 | 0.18 | 0.09 | 0.05 | 0.1 | 0.11 | 0.1 | 0.1 |
| | V-rep | 0.23 | 0.33 | 0.32 | 0.3 | 0.3 | 0.23 | 0.29 | 0.27 | 0.32 | 0.3 | 0.15 | 0.21 |
| | CVE | 8.62 | 5.57 | 13.88 | 2.5 | 3.41 | 6.01 | 50.8 | 47.6 | 4.22 | 51.64 | 5.72 | 11.4 |
| | CVS | 63.09 | 5.98 | 8.93 | 3.85 | 4.28 | 30 | 3.6 | 49.7 | 6.94 | 6.8 | 60.55 | 77.4 |
| | Tsolm | 0.01 | 0.3 | 0.28 | 0.28 | 0.29 | 0.04 | 0.28 | 0.02 | 0.29 | 0.26 | 0.02 | 0.01 |
| | Hmax | 0.2 | 0.13 | 0.11 | 0.27 | 0.14 | 0.21 | 0.14 | 0.08 | 0.12 | 0.16 | 0.13 | 0.13 |
| | Pmax_r | 4.41 | 1.92 | 1.71 | 3.47 | 2.14 | 4.21 | 2.14 | 2.23 | 1.9 | 2.47 | 3.46 | 3.73 |
| | Pmax_p | 4.67 | 2.01 | 1.82 | 3.56 | 2.16 | 4.63 | 2.23 | 2.76 | 1.98 | 2.5 | 3.67 | 3.79 |
| LL | UP | 2.05 | 1.71 | 1.27 | 2.51 | 2.09 | 2.76 | 1.24 | 1.35 | 1.61 | 2.22 | 1.67 | 1.14 |
| | H_flight | 0.13 | 0.11 | 0.07 | 0.19 | 0.13 | 0.17 | 0.07 | 0.06 | 0.1 | 0.14 | 0.07 | 0.06 |
| | V-rep | 0.33 | 0.33 | 0.34 | 0.36 | 0.29 | 0.26 | 0.33 | 0.24 | 0.32 | 0.29 | 0.2 | 0.33 |
| | CVE | 49.86 | 5.47 | 9.59 | 3.87 | 4.83 | 35.1 | 7.9 | 10.6 | 8.23 | 4.49 | 48.96 | 49 |
| | CVS | 7.8 | 4.4 | 4.83 | 5.64 | 4.96 | 4.52 | 9.15 | 64.1 | 8.24 | 5.6 | 33.39 | 8.98 |
| | Tsolm | 0.3 | 0.31 | 0.32 | 0.33 | 0.27 | 0.24 | 0.29 | 0.01 | 0.28 | 0.27 | 0.01 | 0.3 |
| | Hmax | 0.19 | 0.13 | 0.09 | 0.21 | 0.15 | 0.23 | 0.1 | 0.09 | 0.12 | 0.17 | 0.1 | 0.1 |
| | Pmax_r | 2.57 | 1.92 | 1.56 | 2.77 | 2.31 | 3.39 | 1.64 | 2.81 | 1.91 | 2.58 | 2.71 | 1.57 |
| | Pmax_p | 2.66 | 2 | 1.56 | 2.8 | 2.35 | 3.4 | 1.68 | 3.07 | 2.05 | 2.59 | 3.38 | 1.61 |

Analyzing the data we can observe that for the energetic parameters shown in figure 1, 50% participants develop a unit power parameter and a repetition velocity over the mean of the group, while 41,67% participants develop the energetic parameter H_flight over the mean of the group.

For the control parameters shown in figure 2, we conclude that only 25% participants develop a CVS control parameter over the mean of the group, while 58,33% participants develop the control parameter CVE over the mean of the group.

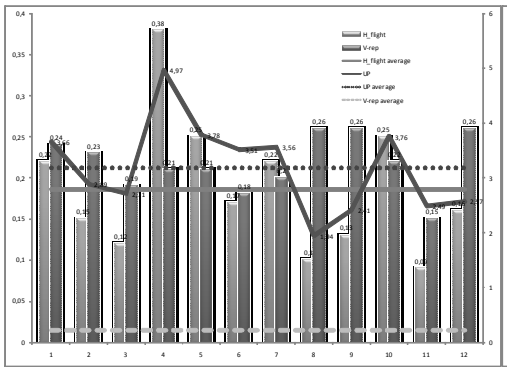



*Fig.1 The energetic parameters*

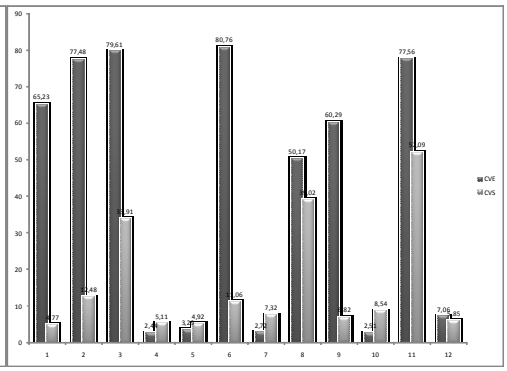



*Fig. 2 The control parameters*

**The body mass index and the ponderal index**

These two indices are used to estimate the distribution of mass along the body. While the body mass index (BMI) named also Quetelet index offers a heuristic estimation of the percentage of body fat.

It can be calculated using equation (1):

$$BMI = \frac{mass[kg]}{height^2[m^2]} \quad (1)$$

The statistics reveal that for Romania, the body mass index for adults is between 18.5 and 24.99 kg/m$^2$.

The ponderal index is more suitable for estimating the body fat percentage providing a more accurate comparison between subjects of different weights and statures.

The ponderal index can be calculated using equation (2):

$$PI = 1000 \cdot \frac{\sqrt[3]{mass[kg]}}{height[cm]} \quad (2)$$

The normal results for this index are between 20 to 25.

| Indices | Participant | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Height | 177 | 180 | 168 | 167 | 175 | 168 | 165 | 172 | 175 | 165 | 155 | 175 |
| Mass | 60 | 75 | 50 | 54 | 72 | 56 | 53 | 60 | 69 | 49 | 50 | 61 |
| BMI | 19.15 | 23.1 | 17.72 | 19.4 | 23.5 | 19.8 | 19.5 | 20.3 | 22.5 | 18 | 20.81 | 19.9 |
| PI | 22.12 | 23.4 | 21.93 | 22.6 | 23.8 | 22.8 | 22.8 | 22.8 | 23.4 | 22.18 | 23.77 | 22.5 |

As we can see in figure 3, only two participants are below the minimum value of BMI, while the rest of them can be considered as having normal distribution of body fat.

In fig.4 we can see the variation of the ponderal index. All participant are within the normal range of the ponderal index.

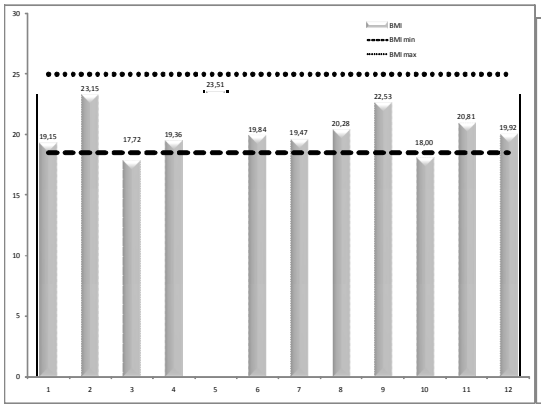



*Fig. 3 Body Mass Index*

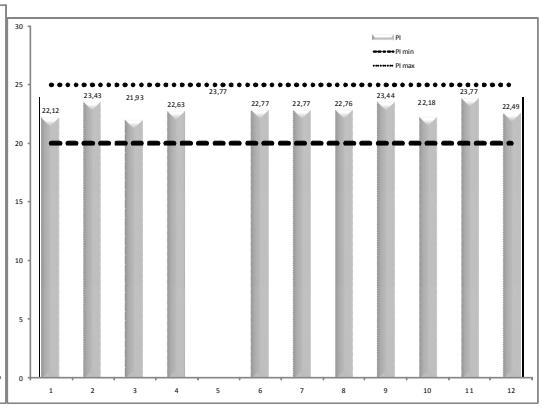



*Fig. 4 Ponderal Index*

**The regression analysis**

The regression analysis estimating the coefficients of a linear model using the least square method, together with the statistics involved in all associated tests. We can also visualize the graphical estimation with the linear model (fig 4, fig.5, fig.6, fig.7).

The regression analysis also provides the ratio of influence of the considered variables on the independent ones.

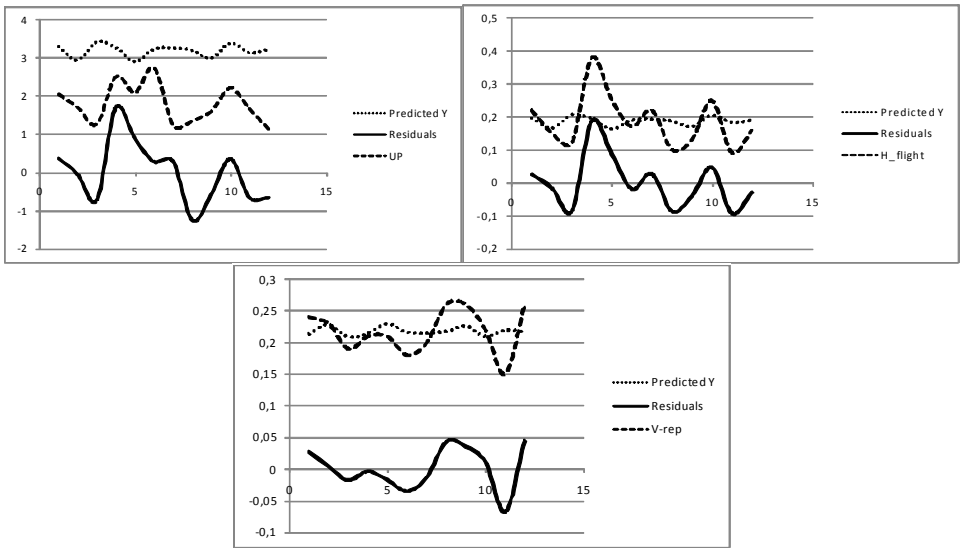



*Fig. 5 The linear models of the energetic parameters and the residuals for BMI*

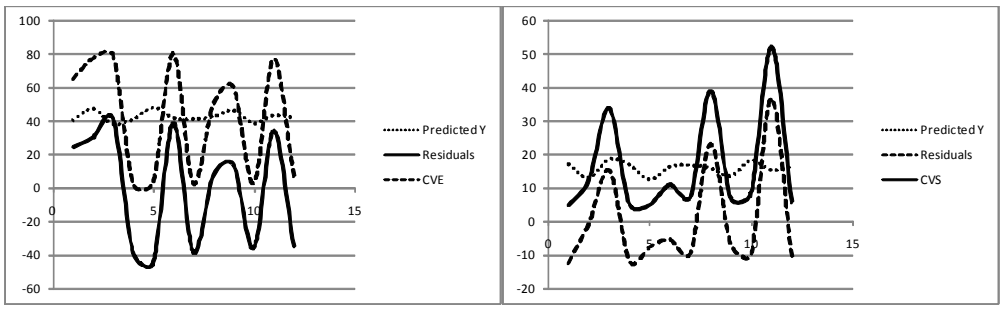
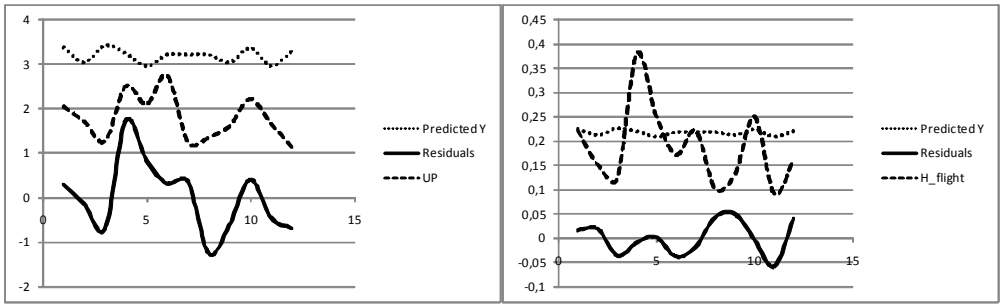



*Fig. 6 The linear models of the control parameters and the residuals for BMI*

Thus, for our experiment, the regression analysis revealed that there is no influence of the considered indices on the variation of the energetic and control parameters. The significance F provided by that analysis must be compared with the critical value. If the significance F is greater than the critical F, we must reject the null coefficient hypothesis. For all our participants in the experiment, the regression analysis proved that the different values of the control and energetic parameters are not influenced by the fat body distribution, concluding that only the level of physical preparation affects the magnitude of the considered parameters.



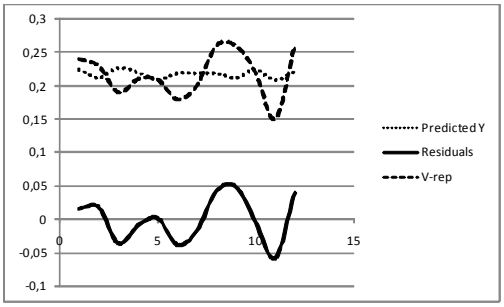



*Fig. 7 The linear models of the energetic parameters and the residuals for PI*

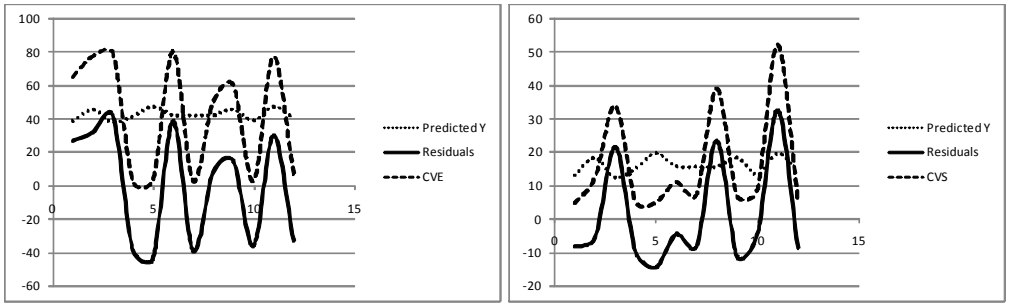



*Fig. 8 The linear models of the control parameters and the residuals for PI*

Thereby, the influence of body mass index is placed in the range 0,8% - 4%, while the influence of ponderal index is placed in the range of 0,9% - 3,75% (table 2).

*Table 2 – The range influence of BMI and PI on energetic and control parameter*

| Indices | PU | H-flight | V-rep | CVE | CVS |
|---|---|---|---|---|---|
| BMI | 4% | 2% | 3% | 0,8% | 1,4% |
| Significance F | 0,53>0,43 | 0,61>0,27 | 0,56>0,35 | 0,77>0,08 | 0,7>0,15 |
| PI | 3,75% | 3% | 3% | 0,9% | 2,3% |
| Significance F | 0,54>0,38 | 0,58>0,31 | 0,58>0,31 | 0,76>0,09 | 0,63>0,24 |

## Conclusion

The regression analysis proves that there is no influence of body mass and ponderal indices on the control and energetic parameters provided by MGM 15 test. That means we cannot estimate the magnitude of these parameters using anthropometric data and the correct interpretation of such parameters must takes into account the physical preparation level of the athlete.

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## Étude sur l'influence de BMI et PI sur les parameters énergétiques et de contrôle

***Résumé:*** *Le document présente les résultats de l'analyse de regression de l'influence des deux indices, l'indice de masse corporelle et indice pondéral sur les paramètres énergétiques et de contrôle pour un groupe de 12 filles, étudiant l'éducation physique et sportive, visant à reveler si ces deux paramètres ont une effet sur leur préparation physique.*

***Mots-clés:*** *paramètres énergétiques, paramètres de contrôle, l'indice de masse corporelle, indice pondéral.*

# STUDY REGARDING THE IMPORTANCE OF COMBINING ADAPTED PHYSICAL ACTIVITIES AND PHYSICAL THERAPY WITHIN THE COMPLEX PROGRAM OF FUNCTIONAL RECOVERY OF PERIPHERAL NEUROPATHIES

**Mirela DAN, Ioan-Cosmin BOCA**
**"Vasile Goldiş" West University Arad**
**Gabriel BALA**
Psychiatry Hospital Nucet, Bihor

***Abstract:*** *Physical autonomy implies a degree of freedom and independence. It constitutes and can be considered as a specific difference and as a form or type of manifestation of freedom and independence. Physical autonomy in peripheral neuropathy may be accepted only in the context of activities designed and constantly supervised by a specialist, who must intervene whenever he observes deviations from objectives. The main purpose of this study is to show the effects of adapted physical activities on the needs of people with peripheral neuropathy both physically and psychologically speaking, and the interaction between the two components in the program.*
***Keywords:*** *physical therapy, adapted physical activities, neuromuscular deficit, peripheral neuropathy.*

**Introduction**

The nervous system controls all functions of body systems and apparatuses, and the interaction between human beings and the environment. The nervous system needs time and accuracy to process information and develop a response to maintain balance, in the sense that walking involves moving a large body mass on a narrow and variable support. Inadequate reception of stimuli often leads to imbalance and falling. In the case of peripheral neuropathy characterized by the decrease of the peripheral somatosensory component, the emergence of imbalances appears imminent and the risk of falling appears to be a danger.

Mobility is expressed through the body's ability to move in space. The indicators of the ability to move are obtained from the self-report description of person, from professional methods of evaluation and from observations made by the tester on the subject's physical performance. Walking and balance are involved in an inter-relationship, because it is difficult to delineate the independent contribution of each subject. As main features we have predominantly distal muscle fatigue and sensory deficit is "in the sock". Specific gait is an ataxic uncertain gait, given by the deficit of sensitivity and the muscle fatigue felt by the patient. The weakness of the gait is expressed through a waddling gait, difficulty in passing over obstacles or while running, movements are a lot slower, "anemic". Because of that there takes place a postural adjustment of the trunk in hyperextension [1], or hyperlordosis with knee hyperextension.

**Organization of study**

Due to the fact that peripheral neuropathy is a disease with a chronic character and can lead to loss of independence of movement, with great effect on the psyche, including patients with such disorders in the various programs involving physical exercise and movement becomes a necessity. Being an interdisciplinary field, adapted motor activities seek to identify and address individual differences in physical activity. That requires an acceptance of individual differences, militating for increased access to an active and sports life, promotes innovation and cooperation between the services which provide it.

The general objectives of adapted motor activities are: to develop, maintain and recover the operating level as much as possible; compensating functional deficiencies by taking the affected positions by the valid components; preventing the de-structuring of certain functions of the body, inducing a state of self-confidence [2].

**Working methodology and selection of subjects**

The first phase of the study consisted of selecting the subjects from the patients hospitalized in the Psychiatric Hospital Nucet, during October-November 2011. During this period, subjects participated in recovery programs, during their hospital admission. With the selected subjects we have made two groups, one for study, namely group 1 with 6 subjects and the control group, namely group 2 with 4 subjects.

The subjects in the study group (table no. 1) participated in the physical therapy program specific for peripheral neuropathies, completed with a specific program of adapted physical activity (AFA), in addition to drug therapy and psychotherapy.

*Table 1 - Presentation of subjects in the study group*

| Subjects | Diagnostic | Age | Sex | Clinical Aspects |
|---|---|---|---|---|
| M.A. | Toxic neuropathy on alcoholic background, cervical spondylosis, astheno-depressive neurosis, | 56 | M | Decreased psychological tone, constant tiredness, daytime sleepiness, postural pain, vertiginous seizures, peripheral muscle fatigue of the lower limbs, difficult, slow, unstable gait, walking with a stick. |
| T.I. | Toxic neuropathy on alcoholic background, st. II HTA, anxious neurosis on somatic background | 55 | M | Psycho-motor restlessness, dyspnea, palpitations, weakness of the lower limbs, paresthesia in lower limbs |
| I.N. | Toxic neuropathy on alcoholic background, neurotic depressive disorder | 58 | M | Sad mood, physical fatigue, moderate polyarthralgias cramps in lower limbs, bilateral hypoesthesia in lower limbs, unstable gait, walking with a stick. |
| C.I. | Peripheral neuropathy on alcoholic background, anxious neurosis on somatic background | 58 | M | Psycho-motor agitation, muscle fatigue, dyspnea, tachycardia, motor sensor deficit in lower limbs, ataxic gait, supported walking. |
| R.I. | Peripheral neuropathy on alcoholic background, osteoporosis, neurotic depressive disorder | 60 | M | Sad mood, physical fatigue, polyarthralgias, sensor deficit in lower limbs, difficult but independent gait. |
| U.O. | Toxic neuropathy on alcoholic background, polyarthritis, st. II HTA, astheno-depressive neurosis | 65 | M | Decreased psychological tone, daytime sleepiness, postural pain, vertiginous seizures, tachycardia, peripheral muscle fatigue of the lower limbs, slow, unstable gait, walking with a stick. |

The subjects in the control group (table no. 2), participated only in the physical therapy program to recover neuropathies, drug therapy and psychotherapy.

All subjects were evaluated initially, then weekly and at the end of the program, but were under daily observation and the changes were systematically recorded.

*Table 2 - Presentation of subjects in the control group*

| Subjects | Diagnostic | Age | Sex | Clinical Aspects |
|---|---|---|---|---|
| T.O. | Toxic neuropathy on alcoholic background, cervical spondylosis, astheno-depressive neurosis | 63 | M | Weakness of the lower limbs, paresthesia of the lower limbs, slow, unstable gait. |
| H.I. | Toxic neuropathy on alcoholic background, HTA st. II, anxious neurosis on somatic background | 65 | M | Physical fatigue, moderate polyarthralgias, muscle cramps in lower limbs, hypoesthesia bilateral in lower limbs, unstable gait, walking with a stick. |
| E.T. | Toxic neuropathy on alcoholic background, neurotic depressive disorder | 59 | M | Psycho-motor restlessness, dyspnea, palpitations, weakness sensation in lower limbs, paresthesia of the lower limbs. |
| M.V. | Peripheral neuropathy on alcoholic background, anxious neurosis on somatic background | 60 | M | Sad mood, Physical fatigue, polyarthralgias, sensor deficit in lower limbs, difficult but independent gait. |

***Assessment Methods***

Initially, the evaluation is needed to assess the deficit to be recovered and residual functional, on which the patient's capabilities and activities are based, and finally assessment indicates the results obtained by applying the recovery program and concludes on possible further measures [3].

The assessment of these subjects was centered for:

- ♦ Gait and balance, dynamics of the gait;
- ♦ Onset and degree of pain;
- ♦ Assessing muscle strength in lower limbs;
- ♦ Assessing global independence.

Regarding the assessment of gait, pursued issues were: balance, symmetry, foot position, the behavior of the lower limb kinematic chain, measurable parameters of

gait, pelvic movements, movements of the trunk and upper limb movements.

*The Tinetti test* is a test that assesses walking and balance, it is simple, easy to perform, lasting for 10-15 minutes. The test has 2 or 3 degrees of appreciation between 0-1, or 0-1-2. Tinetti test has two components: the balance test and gait test, that can also be used separately, but used together give a better appreciation of the possibilities of the tested subject. For interpretation we will have the two scores, so the maximum score for the balance test is 16 points and the maximum score for the gait test is 12 points. The final score is obtained by summing the two, and in the case of the maximum score that will be of 28 points [4].

In principle, pain assessment is based on verbal or nonverbal communication with the patient. You can use a pain assessment scale: *analogue visual* scale with 10 points, where 0 – absence of pain and 10 - the most severe pain imaginable, *verbal measurement scale* [5].

To complete functional diagnosis, muscle testing was performed on muscle groups. In assessing muscle strength scale we used the standardized international scale of manual testing of muscle strength from 0-5, to which we added quotations (+) or (-), used for a clearer differentiation of the force level [6].

*Global assessment* aims to assess deficits at the individual human activity, from the simplest to the most complex. For the global assessment of subjects we used the FIM (Functional Independence Measure) scale, which has 18 items of assessment, of which 13 involve movement, and 5 are cognitive elements [7].

**Kinetic objectives and recovery program**

The study was conducted over a period of six weeks, during which the Subjects of the study group were included in a program of adapted motor activities and the Subjects in the control group performed only specific treatment for neuropathy.

*Kinetic objectives*

- Improving the ability to walk long distances and on varied terrain and training coordination in gait
- Relieving pain and lowering its impact on the possibility of performing certain activities
- Developing global functional ability and reducing complications
- Improving the ability to maintain independence
- Developing muscular strength and endurance of the lower limbs
- Increasing stability
- Maintaining the foot in a functional position

The structure of the common kinetic program followed by the subjects of both groups was:

- Preparing the body for exercise 10 minutes (consisting of general mobilization exercises, flexibility and stretching)
- Recovery through physical therapy program 25 minutes (consisted of techniques neuroproprioceptive facilitation (FNP), to develop muscle tone, postural stability, increasing the amplitude of movement, development of voluntary control, of muscle Strength and endurance).
- Body recovery after effort 5 minutes (consisting of breathing exercises and stretching)

The subjects of the study group, after a 2 hour break, performed the adapted motor activity program with a duration of 40 minutes:

♦ Preparing the body for effort 10 minutes (idem as above)

♦ The adapted motor activity program 40 minutes consisting of:

- Activities for improving balance in walking – having sensory stimulation as an objective and improving walking on surfaces with different textures.
- Activities for developing coordination and for improving muscle strength and endurance of the lower limbs - adapted ball game with the objective: developing coordination between the visual and kinesthetic analyzer and the proprioceptors of the lower limbs;

♦ Body recovery after effort 5 minutes (idem as above).

**Analisys and interpretation of results**

Assessing *balance and walking* (Table no. 3) by applying the Tinetti test shows that the values obtained at the initial assessment by the subjects of the control group are about the same with those of the subjects of the study group, but the final evaluation indicates a decline or stagnation in some cases of the evolution of subjects.

*Table 3 – Values of the Tinetti test*

| | | Study group | | | | | | Control group | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Subjects** | | **M.A.** | **T.I.** | **I.N.** | **C.I.** | **R.I.** | **U.O.** | **T.O** | **H.I.** | **E.T.** | **M.V.** |
| **Assessment** | **Initial** | 22 | 25 | 21 | 19 | 25 | 20 | 24 | 22 | 25 | 21 |
| | **Final** | 25 | 27 | 24 | 24 | 27 | 22 | 22 | 21 | 25 | 20 |
| **Difference** | **Initial/ Normal** | 6 | 3 | 7 | 9 | 3 | 8 | 4 | 6 | 3 | 7 |
| | **Initial/ Final** | 3 | 2 | 3 | 5 | 2 | 6 | 2 | -1 | 0 | -1 |

For walking and balance, comparing the study group with the control group we notice that starting from a small initial difference between the two groups, at the end of the program those included in the study group achieved an average improvement of 2.5 points, compared with the control group who achieved an insignificant improvement of 0.5 points. (Fig. no. 1).

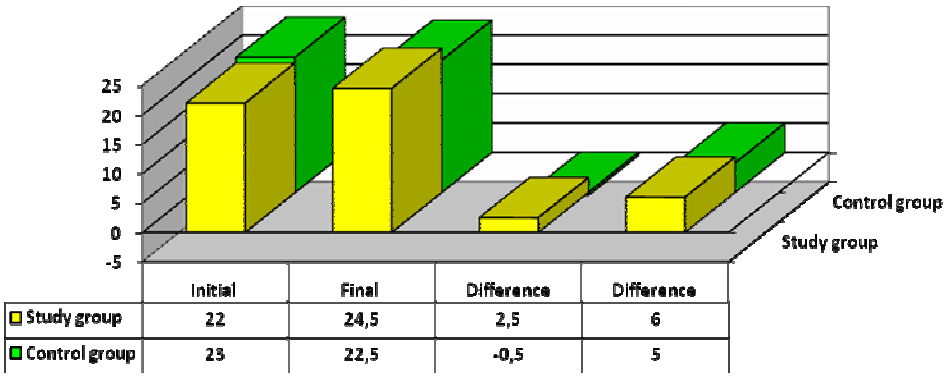



*Fig. 1 – Comparative representation of walking and balance assessment according to the Tinetti test*

*Pain* was assessed using the analog-visual scale for both groups, values between 0% and 100%, 0% representing no pain, 50% moderate pain and 100% unbearable pain. The subjects included in the study group accused a fairly high degree of pain, with an average of 60% which at the end of the program decreased satisfactorily, reaching an average of 36.6% (table no. 4).

*Table 4 - Assessment of pain in the study group*

| Subjects | | M.A. | T.I. | I.N. | C.I. | R.I. | U.O. | Average |
|---|---|---|---|---|---|---|---|---|
| **Assessment** | **Initial** | 70 | 40 | 60 | 50 | 70 | 70 | 60% |
| | **Final** | 40 | 10 | 40 | 20 | 40 | 40 | 36,6% |
| **Difference** | **Initial/Final** | 30 | 30 | 20 | 30 | 30 | 30 | 23.4% |

Assessment of pain in the control group (table no. 5) indicates similar values to those of the subjects in the study group with an average of 57.5%, instead at the final assessment there is a slight difference, 32.5%, respectively.

*Table 5 - Assessment of pain in the control group*

| Subjects | | T.O | H.I. | E.T. | M.V. | Average |
|---|---|---|---|---|---|---|
| **Assessment** | **Initial** | 70 | 40 | 60 | 50 | 57,5% |
| | **Final** | 40 | 10 | 40 | 20 | 32,5% |
| **Difference** | **Initial/Final** | 30 | 30 | 20 | 30 | 25 % |

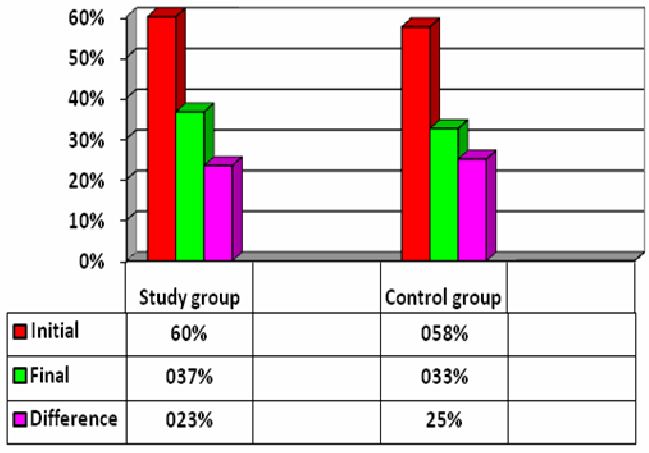



*Fig. 2 – Representation of comparative assessment of pain between groups*

In both groups there was a reduction in pain in approximately equal percentages; however there is a stronger pain relief in the case of the study group compared to the control group by 1.6%. The explanation is that after having participated in the AMA program the subjects in the study group improved their general fitness and also, being involved in physical activity, the perception of pain intensity also changed.

After *muscle testing* for lower limb, we obtained the following values which are the average obtained by testing all subjects in the study group (Table no. 6):

*Table 6 - Average of values of muscle testing in the study group*

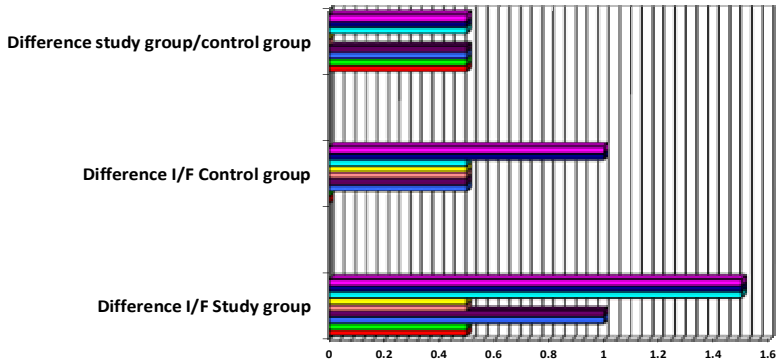
| Tested muscle | Initial | Final | Difference Initial-final | Difference Initial/normal |
|---|---|---|---|---|
| Strength of Iliopsoas m. | 4 | 4+ | 0,5 | 1 |
| Strength of buttocks m. | 4 | 4+ | 0,5 | 1 |
| Strength of Quadriceps m. | 4 | 5 | 1 | 1 |
| Strength of Ischio-leg m. | 3+ | 4+ | 1 | 1,5 |
| Strength of thigh adductors m. | 3 | 3+ | 0,5 | 2 |
| Strength of thigh abductors m. | 4 | 4+ | 0,5 | 1 |
| Strength of Gastrocnemius m. | 3+ | 5 | 1,5 | 1,5 |
| Strength of Tibial m. | 3 | 4+ | 1,5 | 2 |
| Strength of Peroneal m. | 3 | 4+ | 1,5 | 2 |

For the control group the results (Table no.7) indicated an increase of muscle strength only in some muscle groups namely tibial and peroneal muscles by 1 point, and the rest of the tested muscle groups showed no significant values.

*Table 7 - Average of the values of muscle testing in the control group*

| Tested muscle | Initial | Final | Difference Initial-final | Difference Initial/normal |
|---|---|---|---|---|
| Strength of Iliopsoas m. | 4 | 4+ | 0,5 | 1 |
| Strength of buttocks m. | 4 | 4 | 0 | 1 |
| Strength of Quadriceps m. | 4 | 4+ | 0,5 | 0,5 |
| Strength of Ischio-leg m. | 3+ | 4 | 0,5 | 1,5 |
| Strength of thigh adductors m. | 3 | 3+ | 0,5 | 2 |
| Strength of thigh abductors m. | 4 | 4+ | 0,5 | 1 |
| Strength of Gastrocnemius m. | 3+ | 4 | 0,5 | 1,5 |
| Strength of Tibial m. | 3 | 4 | 1 | 2 |
| Strength of peroneal m. | 3 | 4 | 1 | 2 |

The representation of the comparative final results of muscle testing between the two groups (fig. no. 3), shows differences referring to how much muscle strength increased and how it evolved over time. Comparing the two groups we see that for the iliopsoas muscles and buttocks we obtained an increase in muscle strength for the subjects in the study group by 0.5 points compared to those in the control group who have no change from the initial values. The highest value was obtained by the gastrocnemius, tibial and peroneal muscles of 1.5 points from the initial value, for the study group, and for the subjects in the control group the values were lower, 1 and 0.5 respectively.




| | Difference I/F Study group | | Difference I/F Control group | | Difference study group/control group |
|---|---|---|---|---|---|
| Peroneal m. | 1.5 | | 1 | | 0.5 |
| Tibial m. | 1.5 | | 1 | | 0.5 |
| Gastrocnemius m. | 1.5 | | 0.5 | | 0.5 |
| Abductors m. | 0.5 | | 0.5 | | 0 |
| Adductors m. | 0.5 | | 0.5 | | 0 |
| Ischio-leg m. | 1 | | 0.5 | | 0.5 |
| Quadricpes m. | 1 | | 0.5 | | 0.5 |
| Buttocks m. | 0.5 | | 0 | | 0.5 |
| Iliopsoas m. | 0.5 | | 0 | | 0.5 |

*Fig. 3 – Representation final muscle testing*

***Global Assessment*** was carried out using the FIM scale, which assesses movement by 13 criteria and cognition by 5 criteria. Scale score is between 1 and 7, where 1 represents full assistance (100%) and 7 is complete independence.

According to initial and final assessments (Table no. 8) we notice an improvement of both motor score (M), and of the cognitive score (C), for each subject of the study group.

*Table 8 - Global assessment of the study group*

| | | M.A. | T.I. | I.N. | C.I. | R.I. | U.O. |
|---|---|---|---|---|---|---|---|
| **Initial** | **M** | 5 | 5 | 4 | 4 | 4 | 3 |
| | **C** | 5 | 5 | 4 | 4 | 3 | 3 |
| **Final** | **M** | 6 | 6 | 6 | 5 | 5 | 5 |
| | **C** | 7 | 7 | 7 | 6 | 6 | 6 |
| **Difference Initial/Final** | **M** | 1 | 1 | 2 | 1 | 2 | 2 |
| | **C** | 2 | 2 | 3 | 2 | 3 | 3 |
| **Difference Initial/Normal** | **M** | -2 | -2 | -3 | -3 | -3 | -4 |
| | **C** | -2 | -2 | -3 | -3 | -4 | -4 |

For the control group, the global assessment (table no.9) indicates the fact that not all subjects obtained an improvement of the score, a subject for motor score and two for cognitive score, respectively.

*Table 9 - Global assessment of the control group*

| | | T.O | H.I. | E.T. | M.V. |
|---|---|---|---|---|---|
| **Initial** | **M** | 5 | 4 | 3 | 4 |
| | **C** | 4 | 5 | 4 | 5 |
| **Final** | **M** | 6 | 5 | 4 | 4 |
| | **C** | 5 | 5 | 4 | 5 |
| **Difference Initial/Final** | **M** | 1 | 1 | 1 | 0 |
| | **C** | 1 | 0 | 0 | 1 |
| **Difference Initial/ Normal** | **M** | -2 | -3 | -4 | -3 |
| | **C** | -3 | -2 | -3 | -2 |

The comparative presentation of the global assessment of the two groups (table no. 11), shows that the subjects in the study group had better results in terms of their general condition both motor and functional, as compared to the subjects in the control group who did not achieve independence after treatment followed.

*Table 10 – Comparative presentation of global assessment*

| | Study group | | Control group | | Difference Study group/control | |
|---|---|---|---|---|---|---|
| | **Motor score** | **Cognitive score** | **Motor score** | **Cognitive score** | **Motor score** | **Cognitive score** |
| **Initial** | 4,4 | 4 | 4 | 4,5 | 0,4 | 0,5 |
| **Final** | 5,5 | 6,5 | 4,7 | 4,7 | 0,8 | 0 |
| **Difference Initial/final** | 1 | 2,5 | 0,7 | 0,2 | 0,3 | 2,3 |

The graphic representation of the comparative values of the motor score (fig. no. 4) indicates the fact that although starting with almost the same values, namely 4.4 for the study group and 4 for control group, the increases were greater for the study group 5.5, so 1 point increase, compared to 0.7 increase for the control group. For comparative cognitive score (Fig. no. 5), results are also favorable for the study group. Thus starting from a score of 4 study group and 4.5 control group, the increases were in favor of the study group, respectively by 2.5 points to an insignificant increase of 0.2 points for the control group.

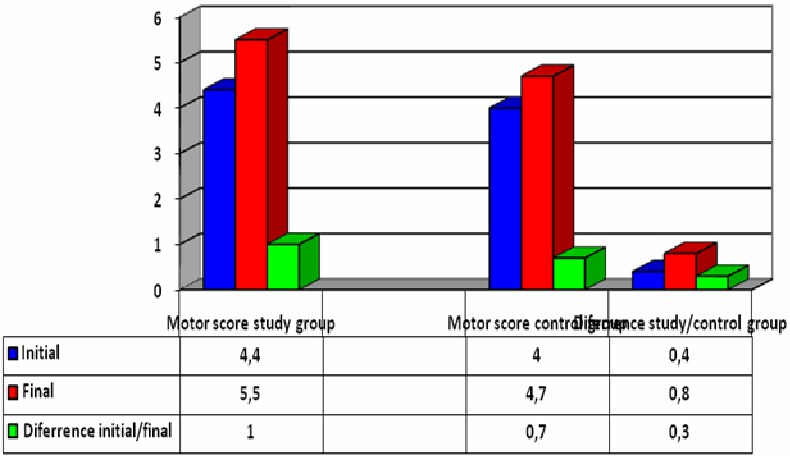



*Fig. 4 – Comparative representation of the motor score*

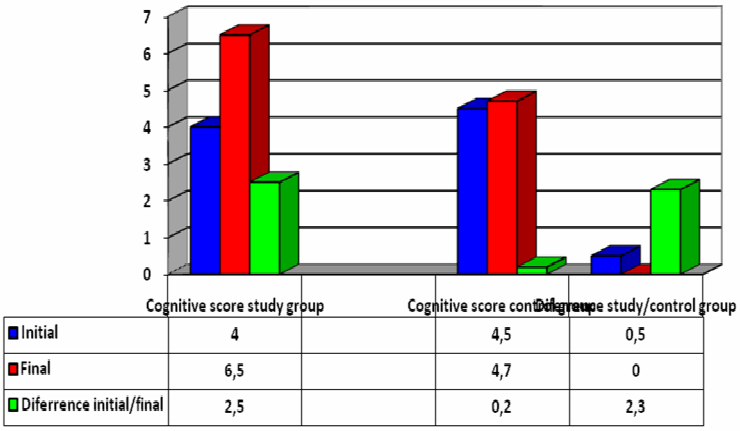



*Fig. 5 – Comparative representation of the cognitive score*

**Conclusions**

The conclusions we reached after this study reinforce the idea of the existence of a positive relationship between physical activity and mental activity.

With regard to general physical condition, we obtained an increase in muscle strength which led to decreased pain, reduction of cramps and muscle spasms, and a continuation of this program would delay the neuro-muscular degeneration. When decreasing pain threshold, we noticed an increase in energy, vitality, which gave the subjects an increase of the sense of wellbeing.

With regard to psycho-social status, the influence of improved physical condition on the mental state was visible, both individually and as a group, as socialization.

Generally speaking, after this program, as we have previously mentioned, we obtained fairly good results, a remarkable improvement in general physical condition that later turned out to have a positive impact on mental state and thus on performing daily activities in all aspects.

To improve the ability to travel long distances and on varied terrain and training coordination in walking, there were organized activities to positively influence the movement, the dynamics of walking and maintaining balance in different situations. The proposed activities were to travel on surfaces with different textures and avoid obstacles, adapted game with the football ball. First, these activities influenced joint mobility and flexibility, muscle strength, stability and balance. In terms of organization we emphasized less individual execution and more team performance, because in this way we stimulated interpersonal relations, competitive spirit and a sense of community.

For this purpose we focused on adapting to different situations, reacting to critical and difficult situations, developing self-control.

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**Etude concernant l'importance de l'association des activites physiques adaptees et la kinesitherapie dans le cadre d'un programme complex de reeducation fonctionelle des neurophaties periferiques**

**Résumé:** *L'autonomie physique signifie un certain degré de liberté et indépendance. Elle constitue, et peut être considérer comme la différence spécifique et comme une forme de manifestation de la liberté et de l'indépendance. L'autonomie physique dans les neuropathies périphériques peut être acceptée seulement dans le contexte des activités prévues et constamment surveillés par le spécialiste, qui doit intervenir dès qu'il observe des déviations auprès des objectives proposées. Le scope essentielle de cet étude est de relever comment les activités physiques adaptées peuvent servir les besoins physique et psychologique des individus présentant des neuropathies périphériques, et aussi de découvrir l'interaction des deux components du traitement, physique et psychique.*

***Mots clés :*** *kinésithérapie, activités physiques adaptés, déficit neuromusculaire, neuropathies périphériques.*

# THE COMPARATIVE ANALYSIS OF THE PERFORMANCE REACHED BY THE LOWER SECONDARY STUDENTS OF THE WITNESS AND EXPERIMENT LOTS AT THE SPEED AND ENDURANCE TRIALS, FROM A DIFFERENTIATED APPROACH

**Mocanu George**[1] Junior Lecturer
**Nanu Liliana**[1] PhD. University Lecturer
[1] "Dunarea de Jos" University of Galati
The Faculty of Physical Education and Sports

***Abstract:*** *The modern educational process concerning the physical education lessons must consider the array of variables conditioning the process of reaching the educational goals at specific parameters, goals that are planned on different time frames. These precise elements of the syllabus highlight the part played by the motor abilities, outlining them as an important indicator of the physical training level, an aspect which conditions the manifestation of other constantly monitored goals: the control and motor abilities level, the equally distributed physical development etc.*
***Key words****: differentiated approach, accessibility, conditional motor skills, puberty age.*

***Introduction***: The disparities presented between the students-physical development classes and the different anthropometric parameters, variable effort potential, uneven progress and assimilating the lesson contents, divergent aptitudes and interests, all lead to the conclusion that the lessons meant to develop the motor

abilities, abounding in high functional tasks, carrying out ***frontal*** activities, with uniquely planned stimuli that are not aimed at the heterogeneous possibilities of the class involved in the activity, could be considered to be an obstacle in carrying out the corresponding effort curves and affects the goals of the training. The differentiated approach aims at avoiding the overcrowding of the activities carried out in one week, resulting in a beneficial separate planning, considering the adjacent action and dosing systems concerned.

If when referring to the primary education, the reduced functional possibilities only allow for a variation of the physical effort's volume, once the quantitative and qualitative accumulations of puberty have been reached, the premises for the increase of the effort's intensity later on, in high school, are created. Planning the physical efforts on various stages (lesson systems), which would include de the permanent modification of the main physical effort parameters shall lead to varied effort loads and thus to a consecutive adaptation of the body to the stimuli, thus being able to reach the long term adaptation through a cumulated activity of the functions and systems of the body (a synergetic effect), that leads to a better management of the programmed efforts.

***The working hypothesis and contents of the experiment :*** We worked on the idea that a distinctive distribution in 3 value groups of the same bio-motor level of the experimental lot for the combined motor abilities themes (the paper only presents the results obtained after having completed the speed, endurance and combined skills parts), eventually leads to obtaining significantly improved results, compared with the control group, where the activities were carried out based on the standard planning, mainly based on the frontal approach.

The *speed* is a lot more important than the other skills, when taking into account the hereditary skill array. The optimization of the physical shape is easy to achieve at puberty, leading to significant results with regard to the speed effort. When applied to 8th graders, it is often associated with coordinative capacity elements, strength and even the specific endurance of the taught physical education themes. An increased importance must be given to the manifestation patterns of the skill at this particular age, as later efforts may not lead to any results, the gains in terms of speed being of a maximum 20% compared to other skills. *The endurance* skill, at the beginning of the lower secondary education, requires predominantly aerobic efforts, thus constantly increasing the time and distances related to the required exercises. The methods based on the variation of the work load may be combined with those based on the variation of the intensity towards the end of the lower secondary education, when the body can easily face the mixed effort intensity. The concerned literature widely states that puberty is the key point of bettering the physical skills base on the endurance effort. At the beginning, the cardiovascular and respiratory systems do not allow for an adequate adaptation to physical effort, the body becoming rapidly exhausted.

*The speed* has been programmed on two distinct theme cycles, taking various manifestation forms at the beginning and end of the school year. The first theme cycle is programmed for September, has 4 lessons and is aimed at the reaction and execution speed in complex acts, and the moving speed in an adroitness context. The reduced number of allotted lessons has resulted in the increase of the specific time (around 15 minutes), reducing the time for throwing the handball and rounder balls, which work on repeating certain structures that have already been taught in previous years. After completing this specific learning unit, the gains in terms of physical skill will be transferred to the lesson plans focusing on the athletic trial (speed trial), at the completion of which the students will be tested at the 50 m speed running trials and the 5x10m back and forth trial. The structures used involve simple movements and a gradual increase of the intensity, eventually involving complex and varied tasks: jumps, leaving certain points on audio or visual signals, running with direction change and turning back, catching and keeping various objects, pair contents, superior levels of varied efforts, aspects found in the application parts that are subject to extensive training.

The second theme cycle has been attributed to the month of May and includes 6 lessons, being focused on the development of the moving speed in varied conditions, on progressive distances and combined with endurance, which are important aspects in optimizing the results obtained at the 1000m boys and 800m girls, where the increased anaerobic lactacid capacity leads to better results.

In terms of the allotted time, it ranges between 7'-9', the rest being required by the sports game and endurance running. The employed means were mostly based in repeated running on different distances (greater than the first cycle), the given pauses not being long enough for the body to be able to fully rest., insisting on keeping the moving speed even when the body is burnt out. The distances and tempos are progressively planned, leading to strong intensities at the advanced group.

Regarding the *endurance*, we have allotted a single lesson cycle for the first semester, this being combined with the coordination groups and sports games. The approach manifestation formulas are the aerobic and mixed cardio-respiratory endurance, well suited for the coordinated sports activities. The main concern shall focus on the second semester too on the cycle allotted to the endurance athletic tryal cycle, which will test the improvement at the end of May. If the low-level groups are mostly driven towards aerobic endurance and resistance, the medium-level ones on mixed endurance, the advances groups can start exploring the possibility of training the anaerob-lactacyde resistance. The proposed means are not meant to induce boredom, on the contrary, they lead to the increase in the student's emotional state and the interest in the activities, leading to a better management of the fatigue state and thus achieving far better results (even, variable and even interval tempo running, technical and tactical structures of increased intensities, applicative structures, string jumps, contests in pairs etc.).

The boys and girls of the $8^{th}$ grade (13-14 years old) were given the following motor tests.

1. *Back and forth 5x10 m.* For this test, two parallel lines are drawn, at 10 m from one another, the child being placed in the back of one of the lines. At a given signal, the executor starts moving at full speed until the other line is reached, which must be reached with both soles of the feet. The child then stops and quickly returns to the first line. Five repetitions have to be carried out. The test must only be given once. The duration is to be recorded in seconds. An anti-slip surface and gear must be used (S.N.E.S. Trial).

2. *Sprint 50 m.* This test is carried out starting from a standing position and on a flat surface. The chronometer starts with the movement of the rear leg. The time is measured in seconds and milliseconds (2 decimals). (S.N.E.S. Trial).

3. Endurance run (800 m – girls; 1000 m - boys). For the lower-secondary education, this test is carried out on S.N.S.E imposed distances. The result is measured in seconds. The subject cannot slow down, walk or stop, as this leads to the invalidation of the test. (S.N.E.S. Trial).

The results obtained following the application of the experimental curricula are presented in the following tables and graphs, the statistical calculations proving the effectiveness of the method on the experimental lot, for boys and girls together.

*Table 1. The relevance of the difference between the initial and final tests, on different lots (Girls – speed and endurance)*

| No | Test name | Initial testing | | | | Final testing | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Control group n=26 | Experimental lot n=28 | t | P | Control group n=26 | Experimental lot n=28 | t | P |
| | | $\overline{X} \pm m$ | $\overline{X} \pm m$ | | | $\overline{X} \pm m$ | $\overline{X} \pm m$ | | |
| 1 | Speed run 50m (sec.) | 8,70±0,10 | 8,75±0,10 | 0,18 | >0,05 | 8,60±0,09 | 8,35±0,08 | 2,08 | <0,05 |
| 2 | Bac/forth 5x10m (sec.) | 17,58±0,61 | 17,53±0,60 | 0,06 | >0,05 | 17,09±0,53 | 15,59±0,48 | 2,11 | <0,05 |
| 3 | Speed endur 800m (sec.) | 332,00±6,81 | 330,00±6,80 | 0,20 | >0,05 | 322,00±6,24 | 302,00±6,11 | 2,16 | <0,05 |

n=26 P - 0,05 0,01 0,001
n=28 t = 2,007 2,674 3,505

*Table 2. The relevance of the initial and final tests on different lots (Boys – speed and endurance)*

| No | Test name | Initial testing | | | | Final testing | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Control group n=30 | Experimental lot n=30 | t | P | Control group n=30 | Experimental lot n=30 | t | P |
| | | $\overline{X} \pm m$ | $\overline{X} \pm m$ | | | $\overline{X} \pm m$ | $\overline{X} \pm m$ | | |
| 1 | Speed run 50m (sec.) | 8,14±0,09 | 8,17±0,10 | 0,23 | >0,05 | 8,02±0,08 | 7,80±0,07 | 2,07 | <0,05 |
| 2 | Bac/forth 5x10m (sec.) | 15,76±0,36 | 15,89±0,37 | 0,25 | >0,05 | 15,33±0,34 | 14,39±0,30 | 2,08 | <0,05 |
| 3 | Speed endur 1000m (sec.) | 291,00±6,08 | 294,00±6,09 | 0,34 | >0,05 | 284,00±6,00 | 267,00±5,88 | 2,02 | <0,05 |

n=30 P - 0,05 0,01 0,001
t = 2,002 2,664 3,505

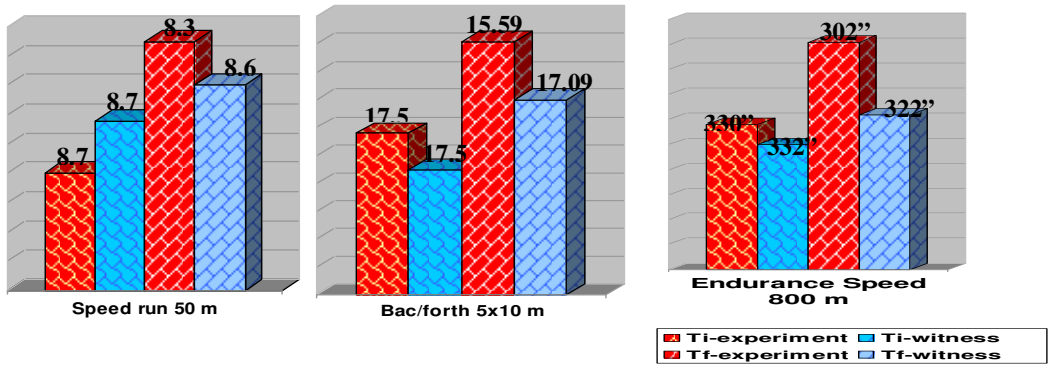


*Image 1. Initial and final tests of the witness and experimental lots at the running trials (endurance and speed) girls*

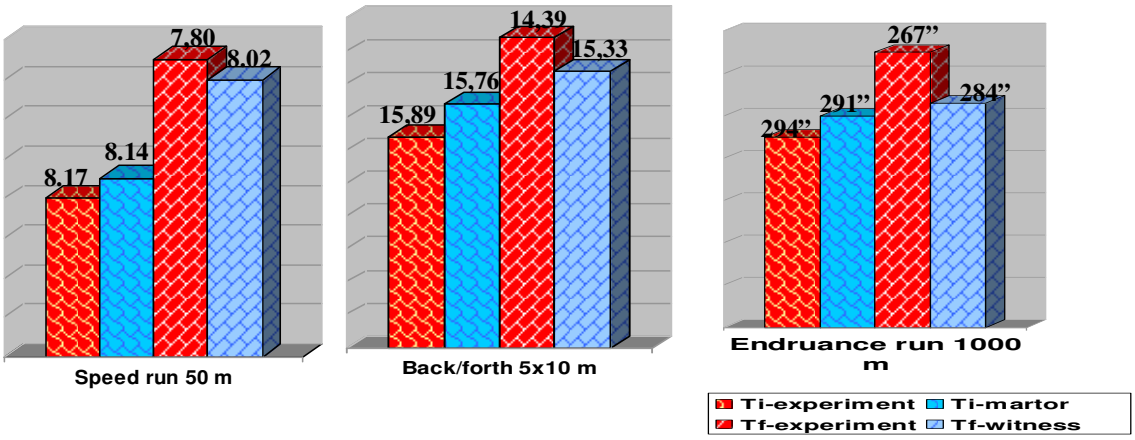


*Image 2. Initial and final tests of the witness and experimental lots at the running trials (endurance and speed)*

By analyzing the results presented in the previous graphs, it can be noted that both experimental groups – boys and girls – have managed to reach superior results when compared to the control groups, for the entire array of tests. The statistical determination presented in the tables presents the significant progress of the experimental groups, the values of t being associated to significant levels, P<0,05, the differences being notable. However, an opposite situation is found when analyzing the values obtained by the control group, as the values of t correspond to P>0,05, the differences being considered to be not significant. This data confirms the effectiveness of the proposed experimental curricula.

***Conclusions and recommendations***:

First and foremost, the reaction and execution speed to various stimuli (visual, tactile and auditory) must be stressed upon, as at the age of 14-15 years of age, these have already reached adult values. For the execution and moving speed, the execution technique must be perfected, then, in this order, the speed must be improved, based on short efforts of great intensity. The optimal distances are 15-25-30-40m, , the pure speed being attained in a 3-5-7 second interval, any value greater than this being associated with fatigue, which annuls the results of the experiment. If the chosen distances are greater than previously mentioned (200-600 m), the movement speed shall not be trained, the phosphate system training being no longer able to support the effort and thus leading to the beginning of the anaerobe lactacid mechanism.

In the speed effort program, it has to be considered that the manifestation at a higher level is directly connected to the muscular force (which leads to the manifestation of the throwing, setting off, starting and accelerating speed), but also to the precision, coordination and stability of the movement (therefore of the quality of the technique).

When developing the reaction and execution speed, a 2"-4" duration is recommended, and 7"-8"-10" for the acceleration speed. The number of repetitions may vary between 4 and 10, with small workloads or without any workload, this number of executions being chosen so that the maximum speed obtained to be maintained at a constant level, the pauses ensuring an almost complete recovery (95%). The effectiveness of the efforts is high if they are to be carried out on an optimal excitability level of the CNS – thus with a completely rested body. It is this very reason that leads to the speed themes being planned first in the lessons. There is also the option of repeating the variable intensity exercises, this aspect allowing the acceleration of the recovery processes and avoiding at the

same time the state in which the body gets accustomed to a stimulus based on a fixed dosage. If the breaks are long enough, the effects of the effort (fatigue) shall be reduced completely, but they must not be too long, as this usually leads to the reduction of the brain's alert state, thus the specialists recommend active alternatives, which are working the same muscle groups, but using leaner moves. Using the same stimuli, without modifying the intensity or replacing them, leads to the body adapting himself and thus to the student's inability of making any more progress (the phenomenon is known as the speed barrier, which is usually surpassed by using maximal tempos).

- Puberty is the least recommended period – especially its first part – for the training of these combinations (speed-endurance), due to the body's inability to tolerate the increased in the level of acidosis.

- At the beginning of the lower secondary education, the *endurance* skill generally requires aerobic efforts, which gradually increase the workload (distances and affected time). The methods based on volume variation may be combined with those based on intensity variation towards the end of the cycle, when the body can better adapt to the mixed anaerobic and alactacid effort capacity.

- Educating the alactacid capacity may lead to great imbalances of the body, this type of effort being better managed at the end of puberty. Nonetheless, in spite of all the side effects, the control tests for the evaluation of the endurance skill (600-800-1000m) require strong intensities, the preparations for these distances based on solely educating the aerobic capacity not offering enough perspectives as to obtain a superior result, the age and physiologic potential of the students limiting them to moderate efforts. In order to be able to educate the specific endurance (which generally works on the muscle groups almost all sports focus on), the specific structures that lead to the adaptation to the effort made must be repeated, so that the tissues can increase their resistance to the lactic acid. Using this type of effort progressively can only be effective after the aerobic capacity reaches a certain level of development, the aerobic efforts, combined with the high intensities thus favouring the ability of the body to rest and restore itself to a previous state.

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**L'analyse comparative de la performance prises par les étudiants secondaire des lots foi et expérience a la vitesse et essais d'endurance, une approche différenciée**

***Mots clef****: traitement différencié, accessibilité, aptitudes psychiques conditionnelles, âge pubertaire.*

***Résumé****: Le processus éducationnel moderne dans les leçons d'éducation physique doit tenir compte de la multitude des variables qui déterminent les finalités du modèle d'éducation physique scolaire, organisé dans certains délais. Dans le cadre de ces éléments stipulés dans le programme de spécialité, les aptitudes physiques ont une grande importance, étant un indicateur de base qui met en évidence le niveau de la condition psychique, aspect qui conditionne la manifestation d'autres finalités, comme par exemple: le niveau de contrôle et valorisation des aptitudes psychiques, le développent équilibré etc.*

# EVALUATING THE FUNCTIONAL STATE THROUGH CARDIOVASCULAR REGULATION TESTS IN YOUNG ATHLETES

**Carmina Liana Musat[1], Alexandru Pacuraru[2], Claudiu Mereuta[2], Malina Coman[1]**
[1]The Faculty of Medicine and Pharmacy, Dunarea de Jos University of Galati
[2]The Faculty of Physical Education and Sports, Dunarea de Jos University of Galati

***Abstract:*** *Determining the heartbeat rate and blood pressure in various hypostases of the human body (rest, orthostatism, low intensity and small duration effort, come-back), constitutes a valuable criterion in assessing the regulation of the cardiovascular apparatus by the nervous system, and hence the entire body's functional state. This aspect is extremely valuable in practice in the scientific guidance of the sports training, as it provides both the signs of adaptation, and overstrain (fatigue). The present study aims at evaluating the functional state by tests of cardiovascular regulation in young athletes, members of the sports clubs of Galati. The study showed a harmonious physical development of junior athletes, and an effort capacity corresponding to the type of strain, elements necessary to achieve the performer's biological model in the sporting events in question.*
***Key words:*** *athletes, Ruffier test, Martinet test*

**Introduction**

In time several tests of cardiovascular regulation during effort have been proposed, differing by:

- The strain type (sporting effort of various intensity levels, intrathorax hypertension, posture change, etc.);
- The cardiovascular element under study (heartbeat rate, blood pressure, or both);
- The moment of data collection (during effort, post effort, or both).

The differences are not essential if the premise of their message is taken into consideration. The importance lies on the study of the quality of cardiovascular regulation for the given strain.

Their interpretation is in accordance with the amplitude of the alterations, the harmony of these alterations (concord between pulse and blood pressure), as well as the recovery time to the values prior to the effort. The smaller and more harmonious the alterations, and the sooner they fade away, the better the test results.

These tests are indicators of the body adaptation to the sports effort and only indirectly the effort capacity, as they only evince the main aspects of regulation, as follows:

- Functional economy assessing the functional price paid by the body to carry out an activity. The less the heartbeat rate and the blood pressure undergo alterations during the test, the better the functional economy;
- Functional harmony assessing the degree of concord between the elements fulfilling this function (heartbeat rate and blood pressure). The discord degree, as amplitude and sense of the heartbeat rate and blood pressure is a sign of functional lack of harmony;
- Functional instability, assessing the quality of a function to adapt to a type of strain and to return to the original level. The quick recovery of the heartbeat rate and blood pressure values is a sign of a good functional state.

**Material and method**

The present study included 60 voluntary male athletes aged between 14-16, all members of CSS and LPS. Three study groups were formed: Group 1- 20 athletes aged 14 (1995); Group 2- 20 athletes aged 15 (1994); Group 3- 20 athletes aged 16 (1993).

The tests of cardiovascular regulation—the Ruffier test were performed in July (initial test) and November (final test) using standardised forms, at 8 a.m., after a rest period of at least 12 hours after the previous training session. The data collected in the two evaluations were centralised in an Excel-type database.

The Martinet test (lab test) was performed in the Laboratory of functional explorations, effort capacity testing and physical development assessment.

**Results**

The average rest values in clinostatism were within normal limits (FC 68-80 beats/min, TA 115/72 mmHg). In orthostatism the FC average values indicated an increase by 10-12 beats/min, systolic TA by 10-15 mmHg and diastolic TA by ± 10-15 mmHg. Post effort the increase of the heartbeat rate reached 45-50%, without going beyond 120 beats/min.

The maximum blood pressure (systolic) increased during effort to average values of 150-189 mmHg and the minimum blood pressure (diastolic) remained at values of 75-80 mmHg, so that the differential blood pressure underwent increases.

The return to the rest levels of FC was recorded in all athletes in the first 3 minutes, and the TA values in 5 minutes. At the end of the test the Dorgo recovery index was calculated (it indicates the body's recovery after effort). The average values of this index were comprised between (-8.4-6). (Table 1)

*Table 1 The average values in the Martinet test—July, November*

| Year of birth | Clinostatism | Orthostatism | Effort | Post effort 1min | Post effort 3min | Post effort 5min | Dorgo Index |
|---|---|---|---|---|---|---|---|
| 1993 | 67.57 | 71.57 | 99.57 | 82.94 | 67.57 | 67.57 | (-7.2;3.2) |
| 1994 | 71 | 75 | 103.8 | 87.4 | 71 | 71 | (-8,4;5,6) |
| 1995 | 67.8 | 71.8 | 99.6 | 82.2 | 67.8 | 67.8 | (-6,8;3,2) |

The values obtained by the calculation of the Ruffier index were within the interval (-3.6-6.4), granting athletes qualifications of average—10 % , good— 10 %, very good— 80% (table II).

*Table 2 The average values in the Ruffier test, July*

| Year of birth | FC P1 b/min | FC P2 b/min | FC P3 b/min | Ruffier Index - interval |
|---|---|---|---|---|
| 1993 | 67.57 | 76 | 67.58 | (-3.6; 5,2) |
| 1994 | 70.94 | 80.42 | 70.94 | (-3,6; 2,4) |
| 1995 | 68 | 76.76 | 68 | (-3.6; 5,2) |

*Table 3 The average values in the Ruffier test, November*

| Year of birth | FC P1 b/min | FC P2 b/min | FC P3 b/min | Ruffier Index - interval |
|---|---|---|---|---|
| 1993 | 67.57 | 76 | 67.58 | (-3.6; 5,2) |
| 1994 | 69.57 | 80 | 69.57 | (-3,6; 2,4) |
| 1995 | 66.6 | 76 | 66.6 | (-3.6; 5,2) |

**Discussions**

The paper provides the support for the debate necessary to the physical education specialist, be it theoretical, or practical, on important issues in elite sports.

The theoretical and practical importance of the study of cardiovascular regulation originates in its being initiated by the nervous system, as it happens with all organs, which means that a good regulation of this function is an indicator of the good operation of the nervous system and hence the entire organism.

The tests of cardiovascular regulation are indicators of the body's adaptation to effort and only indirectly of the effort capacity, allowing the check-up of the efficiency of the training methods used on a given period [1]. The increased mobility of the higher nervous processes due to aerobic training determines the increase of the quality of cardiovascular regulation, viz. the increase of the body's adaptation to effort.

The Martinet test allows the momentary assessment and the time follow-up of the functional capacity of the cardiovascular apparatus, being a useful means, often used in guiding sports training [2]

The regulation test proposed by Martinet assesses the cardiovascular reaction to a standard, non-specific, low intensity and short duration effort.

The Martinet test studies: the functional state of the cardiovascular apparatus during rest; the regulation quality in two types of effort, the former determining the decrease of the cardiac rhythm produced by the passage from clinostatism to orthostatism , and the latter determining the increase of the cardiac rhythm by a short duration, low intensity effort; recovery, in clinostatic position, immediately after effort, a position that eliminates the action of gravity on the return circulation, the function of the cardiovascular apparatus being regulated only by effort-induced mechanisms.

The normal reaction of an athlete with a good training level in the Martinet test exhibits in the 4 moments of the test an evolution of the heartbeat rate and blood pressure consistent with the data in Table IV**.**

*Table 4. Evolution of heartbeat rate and blood pressure in the Martinet test [1]*

| | Clinostatism | Orthostatism | Standard Effort | Recovery |
|---|---|---|---|---|
| Heartbeat rate | 60-90 b/min | + 10-12 b/min | + 50-70% of the rest value | 2-3 minutes |
| Maximum blood pressure | 100-140 mmHg | +10-15 mmHg | + 10 - 35 mmHg | 5 minutes |
| Minimum blood pressure | 60-90 mmHg | ± 5-10 mmHg | - 10-20 mmHg | 5 minutes |

According to the value of the Dorgo index, recovery may also be assessed by the qualifications proposed by the author as follows: very good (FB) = (–10-5); good (B) = (-5-0); average (M) = (0-5); satisfactory (S) = (5-10), poor (NS) = values higher than 10.

The recovery of the heartbeat rate is quick (1-5 minutes), showing a good functional state (good functional lability).

The quality of cardiovascular regulation is better with the decrease of the values of the heartbeat rate and blood pressure for the same effort stage, the increase of the rapidity in recovery to the rest values, and the values of the Dorgo index are negative [1]

The test of cardiovascular regulation highlights the three aspects cardiovascular regulation, viz. functional economy, functional harmony, and functional [2], indicating a better degree of training. Functional economy appreciates the functional price paid by the body to carry out an activity. The less altered the heartbeat rate and blood pressure during the test, the better the functional economy. Functional harmony appreciates the concord degree between the elements fulfilling this function (heartbeat rate and blood pressure). The discord degree as amplitude and sense of the heartbeat rate and blood pressure are the sign of the lack of functional harmony. Functional lability appreciates the quality of a function to adapt to strain and then return to the original state. The quick recovery of the values of the heartbeat rate and blood pressure represent a sign of a good functional state. The test of cardiovascular regulation proposed by Martinet may also be assessed by means of the qualifications Very good (FB), good (B), Satisfactory (S), Unsatisfactory (NS).

The test of cardiovascular regulation proposed by Ruffier provides information on the manner the heart reacts to standard, non-specific, field effort. The comparison of the values of the Ruffier index allows the assessment of the momentary physical shape of the subject.

The data in the specialised literature maintain that the average values of Ruffier index in the fond runners with a high degree of training are included between – 5 and 0 to qualify for what the author considers as "very good" and between 0 and +5 for "good" [3-5].

**Conclusions**

The study showed a harmonious physical development of junior athletes, and an effort capacity corresponding to the type of strain, elements necessary to achieve the performer's biological model in the sporting events in question.

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**Evaluer d'état fonctionnel grace a des tests régulation cardiovasculaire chez les jeunes athlétes**

*Determiner la fréquence cardiaque et de pression artérielle dans les hypostases différentes du corps humain (repos, orthostatisme, de faible intensité et d'effort petite durée, come-back), constitue un critére important dans l'évaluation de la réglementation de l'appareil cardio-vasculaire par le systéme nervoux, et donc l'état fonctionnel du corps entier. Cet aspect est extrêmement précieuse dans le practique à la direction scientifique de l'antaînement sportif, car elle fournit a la fois les signes de l'adaptation et un effort excessif (fatigue). La présente étude vise à évaluer de l'état fonctionnel par des tests de la régulation cardiovasculaire chez les jeunes athletés membres des clubs de sport de Galati. L'étude a montré un développement harmonieux physique des athlétes, et un capacité d'effort correspondant au type de souche, les elements necessaire pour parvenir a un modéle biologique de sportif dans les événements sportifs en question.*

# DETERMINING THE COGNITIVE INTELLIGENCE OF THE SCHOOL OF FOOD SCIENCE AND ENGINEERING'S STUDENTS

**Nanu Liliana**[1] PhD. University Lecturer
**Mocanu George**[1] Junior Lecturer
[1] "Dunarea de Jos" University of Galati
The Faculty of Physical Education and Sports

***Abstract:*** *Intelligence is not a generally valid criterion, each individual having his own array of knowledge and skills, which sets him apart from all the others. Moreover, no individual can be labeled "stupid", just because he might or might not have mathematics, biology, linguistic or sports related knowledge, due to the fact that he certainly excels in other fields.*

***Key words****: intelligence of the language, mathematic intelligence, visual intelligence*

The human being is considered to be the very essence of the evolution of life, a live and hyper-complex system, formed by a mind and a body, with an exceptional evolution with regard to the biologic and psycho-social aspect.

From the oldest of times, philosophy was the science that brought light upon the differences between people with regard to their level of intelligence. Generally speaking, people, some more intellectually able than others, reflect the individual capacity of solving different problems, to think in an abstract manner, to understand complex ideas and even to learn with ease or with much effort. This trait defines the cognitive or rational intelligence and can be determined by solving specific tests.

Intelligence is not a generally valid criterion, each individual having his own array of knowledge and skills, which sets him apart from all the others. Moreover, no individual can be labeled "stupid", just because he might or might not have mathematics, biology, linguistic or sports related knowledge, due to the fact that he certainly excels in other fields.

We have to mention the fact that intelligence is not a homogeneous concept and that there are several types of intelligence, for example – the verbal, non-verbal, emotional, cultural, visual, linguistic, physical intelligence and others. Moreover, researchers have determined the fact that the results of the intelligence tests may be influenced by gender: for example, boys are prone to be better at spatial items, while girls are prone to be better at verbal items.

Through the subject it tackles with, this paper aims at determining the cognitive intelligence level of the School of Food Science and Engineering's students (FSIA), this being a first step in evaluating and correlating the data processed with the results of the tests

determining the physical training level (physical intelligence) of the students.

The ***aim of the research*** is given by the assessment of the intelligence quotient of the FSIA students.

The ***goal*** of this paper is to inform about and stress upon the importance of the FSIA students' rational intelligence, and generally of the young adults, in carrying out their day to day life in the 21st century.

The ***hypothesis*** is based on the assumption according to which good information and good cognitive knowledge and skills management may positively influence personal events and success in life.

The ***employed research methods*** are: studying the concerned bibliography, class observation, interview investigations, the psycho-metric method and mathematical methods.

The ***scientific process*** took place during November the 15th 2010 and March the 15th 2011, on 197 students, of which 86 were boys and 111 girls, all studying at FSIA.

The ***intelligence tests*** mentioned in the hereby paper have been interpreted according to the data provided by the bibliography edited by Horst H. Siewert.

Of all the proposed tests, only three were selected for this research: *a language intelligence test* (30 items), *a mathematic intelligence test* (29 items) and a *visual intelligence test* (40 items).

The test assessment was carried out by giving one point for each correctly solved item, as follows:

- *the language intelligence test* – between 26 and 30 points = very good, IQ over 130; between 23 and 25 points = good, IQ of around 120; between 20 and 22 points = above average, IQ of around 110; between 17 and 19 points = below average, IQ of around 90; between 13 and 16 points = weak, IQ of around 80; 12 points or lower = very weak, IQ below 70;
- *the mathematic intelligence test* – between 26 and 29 points = very good, IQ over 130; between 23 and 25 points = good, IQ of around 120; between 20 and 22 points = above average, IQ of around 110; between 17 and 19 points = below average, IQ of around 90; between 15 and 16 points = weak, IQ of around 80; 14 points or lower = very weak, IQ below 70;
- *the visual intelligence test* – between 35 and 40 points = very good, IQ over 130; between 31 and 34 points = good, IQ of around 120; between 27 and 30 points = above average, IQ of around 110; between 17 and 26 points = below average, IQ of around 90; between 11 and 16 points = weak, IQ of around 80; 10 points or lower = very weak, IQ below 70;

Following the data analysis process concerning the aforementioned tests and according the data provided by the bibliography edited by Horst H. Siewert, it can be *concluded* that the students have *above average* scores at the language intelligence test and *below average* scores at the mathematic and visual intelligence tests. Should the study be further refined by gender, the boys had lower value than the girls for all the three tests they were asked to take (table 1).

| Car. statistici | B/F | Pct. | IQ L | Pct. | IQ M | Pct. | IQ V |
|---|---|---|---|---|---|---|---|
| ∑ | B/F | 4287 | - | 3404 | - | 4935 | - |
| *x* | B/F | 21,7 | above average | 17,2 | below average | 25,0 | below average |
| σ | B/F | 0,90 | - | 0,87 | - | 0,94 | - |
| ± m | B/F | 0,24 | - | 0,21 | - | 0,24 | - |
| V % | B/F | 4,23 | - | 5,08 | - | 3,71 | - |
| ∑ | B | 1876 | - | 1456 | - | 2219 | - |
| *x* | B | 21,8 | above average | 16,9 | weak | 25,8 | below average |
| σ | B | 1,33 | - | 1,00 | - | 1,26 | - |
| ± m | B | 0,39 | - | 0,29 | - | 0,36 | - |
| V % | B | 6,21 | - | 6,20 | - | 4,97 | - |
| ∑ | F | 2411 | - | 1948 | - | 2716 | - |
| *x* | F | 21,7 | above average | 17,5 | below average | 24,4 | below average |
| σ | F | 0,43 | - | 0,13 | - | 0,32 | - |
| ± m | F | 0,15 | - | 0,08 | - | 0,12 | - |
| V % | F | 1,98 | - | 1,12 | - | 1,26 | - |

From the statistical point of view, analyzing the *arithmetic mean* of the two groups, boys and girls, it can be noted that, at the language intelligence test, the groups having taken part in the experiment got almost the same values, while at the mathematic intelligence test, the girls managed to score better than the boys with 0.6 points and at the visual intelligence test, the boys had higher scores than the girls with 1.4 points.

*The variability quotient*, for both groups, displays a great homogeneity of the results and low variability, even if the difference between the two groups is significant at all the three tests. The *standard deviation* is lower for the girls group than for the boys group (image 1).

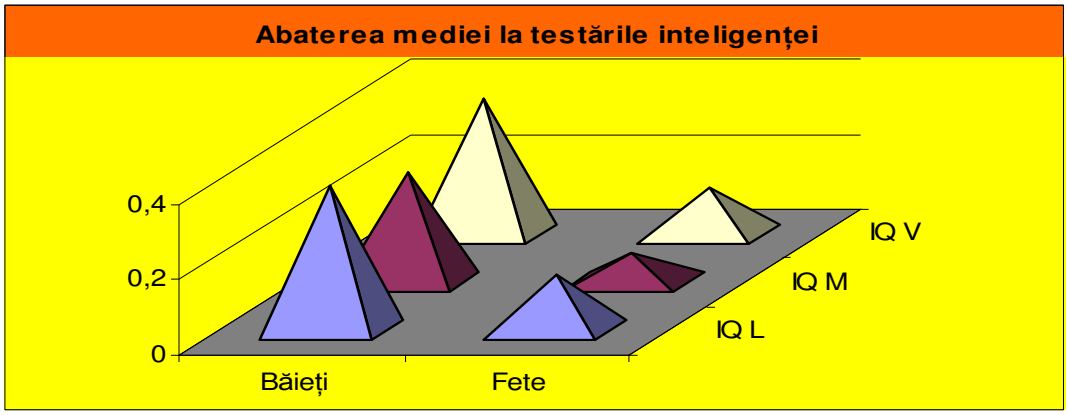


*Image 1 Difference between results (boys and girls)*

Following the analysis of the intelligence tests data, it can be concluded that the students of the School of Food Science and Engineering managed to get above average results at the linguistic intelligence tests and below average at the mathematic and visual intelligence tests.

The conclusion that can be drawn from this analysis is that the tested students have above average linguistic knowledge, but limited visual and mathematic knowledge, this being a probable cause of the high school curricula.

The results come to confirm the working hypothesis, according to which good information and good cognitive knowledge and skills management can determine a good intelligence assessment and can positively influence the approach of the day to day life events.

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## Détermination de l'intelligence cognitive aux étudiants Faculté des Sciences et Technologies des Aliments

***Mots clefs:*** *intelligence du langage, intelligence mathématique, intelligence visuelle*

***Résumé:*** *L'intelligence n'est pas un critère universellement valable, car chaque personne dispose d'un bagage d'aptitudes et de connaissances qui la différencie des autres. En même temps, nous ne pouvons pas considérer qu'une personne est « sotte » parce qu'elle n'a pas de connaissances en mathématiques, biologie, linguistique ou même dans le domaine de l'éducation physique, car, certainement, elle dispose d'autres aptitudes et connaissances dans d'autres domaines.*

# ENDORSEMENT ON EXPERIMENTAL CONTRIBUTIONS OF MENTAL ACTIVITY IN THE PHYSICAL TRAINING METHODOLOGY JUNIOR FOOTBALLERS, AGE 17 YEARS

**Assoc. dr. Ploesteanu Constantin[1]**
**Assoc. dr. Cretu Marian[2]**
**Lecturer. dr. Dragan Aurelian[1]**
[1] "Dunarea de Jos" University of Galati, University of Pitesti[2]

***Abstract:*** *In our field, sports, individual acts and actions done driving both opponents and their own limits. Events that are created tend to perfection act psychomotor functional capacity to self-expression. The research addresses the training of junior football, which includes in addition to the methods and means of physical training, technique, tactics and the psychological preparation. It shows an active contribution.*
***Keywords****: sports training and mental process.*

**Introduction**

In order to obtain a volume rich expertise as a study as diverse as possible. Literature (E. Claparède, 1975, M. Epuran, 1990) stated unequivocally that the basis is the act psychogenesis motor, and it is characterized by physical effort. In other words, the act motric is high energy and information system is structured human psyche that even though it is not specialized in spreading information, but energy consumption and storage.

**Purpose**

The purpose of the research is in need of sports training correlation means that can have direct influence on the development of the psyche in a series of sports oriented physical sides.

**The research hypothesis**

By applying proper breathing exercises "Hatha-Yoga", achieved by focusing the psychological factor is expected to improve both the volume control breathing and physical factor at junior football players, aged 17 years.

**Tasks**

Lies in addressing both psychological factors and the ways of practical work in sports training, sports training pathways (yoga type exercises "hatha yoga") which applied under different conditions of space and time influence the human psyche.

**Subjects, place and duration of research:**

- experimental group class XII high school Sports football Galati - control group;

- control group, the Junior Football Club I "Danube Galati".

Place high school sports gymnasium research Galati Research duration: 10 September to 10 December 2010.

**Research methods used**

Bibliographic study, teaching observation, testing and measurements, graphical and tabular method, experiment teaching mathematical and statistical methods, the comparative method.

**The experimental program**

In the experiment has developed a curriculum developed for 3 months work.

The experimental group trained with Yoga exercises "hatha yoga" every day between the hours of 18.00-19.00 Tuesday and Thursday in order to optimize system behavior sporting performanțial control lines, in our case "consumption of oxygen in the air".

Measurement of vital capacity (VC), the volume of air components: current volume (VC), inspiratory reserve volume (VIR), expiratory reserve volume (VER) was performed spirometer.

Proper dosing and proper execution of exercises as "Hatha Yoga" has implemented and helped to relax, muscle and nerve driven down for intentional and voluntary muscle tone which will make it self-regulation self mental state, if the experiment proposed to improve physiological indices of breath with beneficial effects on physical training methodology. They practiced in a complex of three exercises each month in the order described.

**BREATHING EXERCISES ARE FOCUSED ON FOCUS ADJUSTMENT, SELF, MOTIVATION**

*Complex nr. 1*

| MEANS | Execution time Number of repetitions | Pause between repetitions | Break between series |
|---|---|---|---|
| Gimnastica de încălzire | 15 min | | |
| Exercise 1 - Breathing complete (standing) | 6 x 6 | 10 sec | 4 min |
| Exercise 2 - Retention of breath | 2 x 32 | 30 sec | 4 min |
| Exercise 3 - deep and rapid breathing through the nose | 6 x 6 | 10 sec | 4 min |
| Back - self-relaxation | 15 min | | |

*Complex nr. 2*

| MEANS | Execution time Number of repetitions | Pause between repetitions | Break between series |
|---|---|---|---|
| Gymnastics heating | 15 min | | |
| Exercise 4 - Breathing on one nostril | 3 x 30 | 20 sec | 4 min |
| Exercise 5 - bellows | 3 x 30 | 20 sec | 4 min |
| Exercise 6 - Cleansing Breath | 3 x 30 | 20 sec | 4 min |
| Back - self-relaxation | 15 min | | |

*Complex nr. 3*

| MEANS | Execution time Number of repetitions | Pause between repetitions | Break between series |
|---|---|---|---|
| Gymnastics heating | 15 min | | |
| Exercise 7 - Breathing "HA" | 3 x 30 | 20 sec | 4 min |
| Exercise 8 - Breathing through the nose | 6 x 15 | 10 sec | 4 min |
| Exercise 9 - Withdrawal abdomen | 6 x 15 | 10 sec | 4 min |
| Back - self-relaxation | 15 min | | |

*Complex nr. 4*

| MEANS | Execution time Number of repetitions | Pause between repetitions | Break between series |
|---|---|---|---|
| Gymnastics heating | 15 min | | |
| Exercise 10 - Isolation abd muscles. | 2 x 30 | 30 sec | 4 min |
| Exercise 11 - Breath of trunk extension | 6 x 15 | 10 sec | 4 min |
| Exercise 12 - lunge | 6 x 15 | 10 sec | 4 min |
| Back: self-relaxation | 15 min | | |

**The solutions proposed in this paper aims to:**

In the framework of the training process to follow that through yoga exercises to improve information, identity and biophysical capacity of the individual, in this sense was used:

- verbal means, they can be reproduced once the psycho-motor ability development has made a sufficient need, language is the most complex form of psychomotor coordination, which develops spontaneously and characterized in this regard a social microclustered;
- motor activity characterized by high consumption of energy (exercise), has limited possibilities to operate on the information area. It is complete and logically necessary (quantity and quality) of this system specializing in spreading information;
- transition from the spoken word (motor-external) to address "internal" is the decisive moment in the formation and mental development, intelligence, thus achieving concentration and structure information, or mental development;
- attention-concentration is based on information and awareness of athlete care errors and to identify elements around which focuses attention;
- voltage adjustment is the use of breath (Yoga) to control abdominal anxiety;
- motivation for the race, indicating objectives involving corrections conduct (behavior);
- emotional control, identification is more common situations where loss of control of their emotions, learning to control anxiety with relaxation techniques;
- fatigue and pain tolerance by information to improve the fatigue effect of physical condition;
- identification and integration into the group by gathering information that helps to know better the athlete, setting ground rules that lead to living together in groups.

**Control samples and standards**

1. Measurement of vital capacity (VC), the volume of air components (VC; VIR, VER).

2. Evidence of resistance: running the 1600m and 3200m.

Further analysis and argumentation present experimental initial test results and final component of respiratory and physical resilience. The analysis was based on physiological indicators to assess the level of training and the breath of physical training. The initial testing (Table 1 and 2) the results groups surveyed were well below the national average.

*Table 1*

*Physiological indicators to assess the level of the groups surveyed breath*

| Indicators - Group | **CV** | **VC** | **VIR** | **VER** |
|---|---|---|---|---|
| Experiment | 3771,36 | 581,36 | 1304,31 | 1885,68 |
| Witness | 3720,90 | 593,18 | 1267,72 | 1857,72 |
| National | 4215,27 | 675,31 | 1424,27 | 1967,34 |

*Table 2*

*Assess the level of physical training groups surveyed*

| Indicators - Group | **1600 m** | **3200 m** |
|---|---|---|
| Experiment | 6',38'' | 13',28'' |
| Witness | 6',37'' | 13',37'' |
| National | 5',48'' | 11',46'' |

Here are the final test results on the physiological component of breathing and physical preparation

*Table 3*

*Final test results - physiological component - the groups surveyed*

| Functional tests / Statistical indicators | | **C.V** | **V.C** | **V.I.R** | **V.E.R** |
|---|---|---|---|---|---|
| **The arithmetic mean** $\overline{X}$ | **final witness** | 3759± 0,03 | 602 ± 0,005 | 1277 ± 0,01 | 18806 ± 0,16 |
| | **final experiment** | 4,161± 0 ,01 | 620 ± 0,03 | 1460 ± 0,0075 | 20,81 ± 0,185 |
| **Standard deviation** $\sigma$ | **final witness** | 158,41 | 52,45 | 109,44 | 79,21 |
| | **final experiment** | 288,81 | 43,38 | 120,79 | 114,4 |
| **Coefficient of variation v (%)** | **final witness** | 4,21% | 8,71% | 8,571% | 5,50% |
| | **final experiment** | 6,94% | 7,01% | 8,26% | 4,21% |

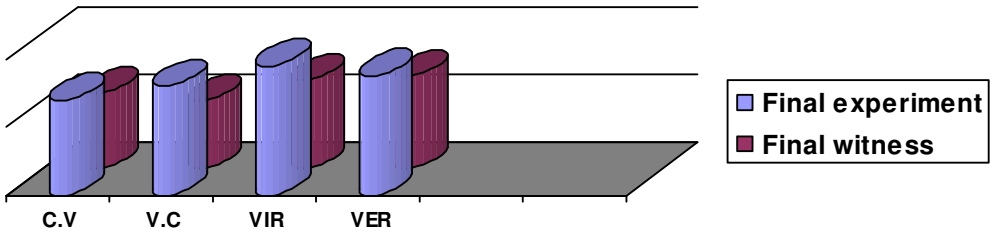


*Fig. 1 Graphical representation of the final test results of groups surveyed*

The notes at the end of the pedagogical experiment increases the arithmetic mean of the laboratory of experimental group and three of the four tests the coefficient of variation expresses the experimental group increased homogeneity.

These results are determined by positive transfer phenomenon driving qualities, depending on the content displayed complex exercise, which allows predicting sports results needed in this case, the junior football for 17 years.

The following are the final test results analysis and reasoning on physical training component.

*Table 4*

| Physical test / Statistical indicators | | **1600 m** | **3200 m** |
|---|---|---|---|
| The arithmetic mean $\overline{X}$ | final witness | 378'' ± 0,03 | 768 ± 0,005 |
| | final experiment | 356''± 0 ,01 | 709 ± 0,03 |
| Standard deviation $\sigma$ | final witness | 4 | 11,62 |
| | final experiment | 5,18 | 10,63 |
| Coefficient of variation v (%) | final witness | 1,54% | 1,51% |
| | final experiment | 1,06% | 1,50% |

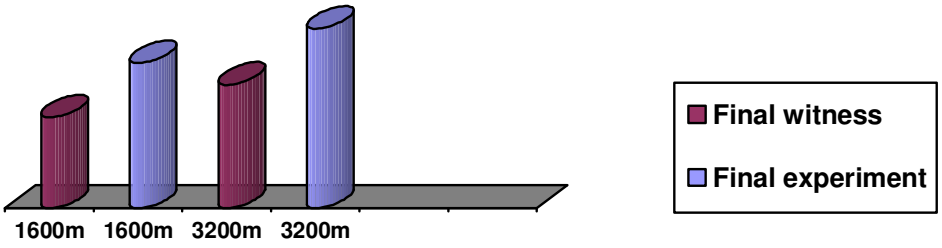


*Fig.2 Graphical representation of the final physical test results of the groups surveyed*

During the research, progress is evident experimental group and runs tests on the resistance which expresses their growth at the end of the experiment.

**Conclusion**

In looking to improve athletic performance, you should try constantly by means of adaptive sports training level of the players along with rules that lead to so-called "self-control"; Embodying in some of the above ideas, this is why psychological preparation of athletes is of particular importance:

- psychological preparation of athletes improves general training;
- positively affects psychological preparation displaying the players in competitions;
- psychological training helps the athlete to realize the importance of the training, it teaches the meaning and power to choose his own means of training and provides power to self;
- without psychological training, athlete training is complete. An athlete is not prepared mentally, can not achieve high performance, regardless of his physical preparation, technique and tactics.

This work may be a guide for specialists and coaches to meet the basic theoretical concepts and to provide the practical solution to a segment involved in concentration and attitude has on the psyche of brain function.

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## Approbation des contributions experimental de l'activité mentale dans les footballeurs entraînement physique, junior méthodologie âge de 17 ans

***Mots-clés:*** *sport processus de formation et mentale*

***Résumé:*** *Dans notre industrie, les sports, les actes individuels et les actions menées par la conduite de l'ennemi et de créer des événements perfection limite.Sunt propres ont tendance à agir psychomoteur capacité fonctionnelle à l'auto-expression.*

*Les travaux portent sur la formation de football junior, qui comprend en plus des méthodes et des moyens d'entraînement physique, technique, tactique et la préparation psychologique.*

*Il démontre la contribution de la psychologie, qui peut être atteint même par le biais (spécifique) de formation sportive.*

# EXPERIMENT ON THE PREPARATION OF TECHNICAL FOOTBALLERS JUNIOR "A"

**Assoc. dr. Ploesteanu Constantin[1]**
**Assoc. dr. Cretu Marian[2]**
**Lecturer. dr. Dragan Aurelian[1]**
[1] "Dunarea de Jos" University of Galati, University of Pitesti[2]

***Abstract:*** *If the proposed experiment and based on competitive schedule we designed an experimental program of technical training, the requirements of the game. Choosing this way of working is required in the current game, because the technique is effective depending on space and time game drive. In this context the work was moving to see how the technical preparation of senior football.*
*In the game of football both physical training and tactical and technical training is important. We can not have technical training without physical training also can not have a tactical training without technical training. Thus, we designed an experimental program of technical training, the requirements of the game, with two weekly training sessions conducted during competitive price and competitive senior football team "Danube" Galati.*
*If the proposed experiment and by choosing the calendar competitive way of working was to see how changing the technical preparation of senior footballers are set out the objectives of each component, which was the subject of research: establishing training volume indices, indicating the method; passing data and control rules of evidence.*
*After the experiment is found positive transfer by force of execution and precision in hitting the ball with both feet, head, and the throw-in.*
***Keywords****: sports training, programming, training process, performance, objectives, technical training.*

**The purpose**

The correct execution of techniques is the most important thing to football players formed for the acquisition of specific motor skills.

**Tasks**

A group of subjects is tested twice on the same variables, respectively for initial testing and final testing.

**Objectives**

Soccer player must first form an accurate picture of executive action, ideal, they are trying to imitate, adapting its features.

**The research hypothesis**

It is assumed that practice specific motor skills in line with proper training will improve the technical preparation and execution on the default tactic.

**Organizing and conducting research**

The experiment was carried out on the stadium "Danube" Galati. Date: March 2011 - June 2011, during competitive, according to a schedule 2 week training technique performed on Tuesdays and Thursdays, containing the same training program.

**The content of training**

20 min. Preparing the body for the effort made with technical exercises performed with the ball.

50 min. Technical Training:

6' Dribbling (the ball) among 10 milestones. The distance of 12 m are placed on end 10 benchmarks. Leading player among the ten milestones ball before, it bypasses the last ball and runs back through the cones. Repeat the exercise 5-6 times alternating with another player. Control sample: is measure the time and consider the best result.

6' Transmission (hitting) the ball away on foot. It will draw a corridor width of 10 m. The goal throw or 16m line perpendicular to the goal line for one of the two rectangles marked beyond the center line for 6 minutes. Control test: measure the distance the longest of 3 trials performed with preferred foot.

10' Dribbling, taking, shot at goal kick at the point indicated. Run the ball hitting the point indicated by the 16.50 m, necessarily carried with lace full / interior. The gate is divided by vertical bands, gate pillars distance into three parts, target areas being the side. The starting point is at 10m away from the line marked perpendicular penalty area.

The player will start to dribble through five milestones and complete action shot at goal from about 16.50 meters from the gate. Consider kicks the ball enters the goal without touching the ground, before overcoming line port. Control sample: run 10 attempts preferred foot and recorded successful executions.

10' Hitting (execution) of corner ball. The throw from the corner over 3-4 cones perpendicular distance of 10m from the corner of the field (arc) in a defined area of 16.50 m of which for 10 minutes. Control sample: run 10 attempts preferred foot and recorded successful executions.

10' hitting the ball with the head centered in the ball coming. The player starts with a top speed of 16.50

m at the corner of the box, centering attack offered by coach or a teammate head and shoot at goal.

**Control sample:** 10 test runs of jump or plunge and recorded successful executions. 6' throw the ball from the edge. It throws the soccer ball from the sidelines with two hands above his head in court.

**Control sample**: 10 runs in throw attempts on the spot and record the successful executions and throwing distance. 10 min. Endurance + abdomen.

**Total workout 80 minutes**

The execution remains constant means (probably time) control contractor to determine the extent to which the acquired or which is remoteness from initial testing.

The results of the technical preparation of the football team "Danube" Galati seniors (n = 20).

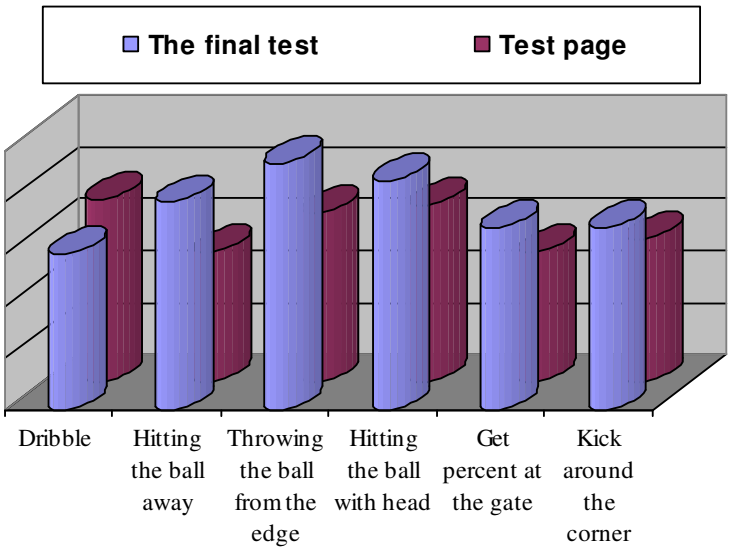


*Fig. 1 Graphic expression of the results of technical training to senior football team "Danube" Galati*

Technical test "hitting (transmission) ball with the foot" final testing of 71.75 m is higher than the initial testing, progress is an increase of 11.75 m or 24.35%. Technical test "throwing the ball from the edge" final testing of 19.7 m is higher than the initial test has an average of 17.5 m, progress is an increase of 2.2 m or 12.57%.

Technical test "hit the ball with his head" final testing of 9.4 is higher than the initial test has an average of 7.1 progress is an increase of 2.3 or 32.39%.

Technical test "dribbling, taking, shot at goal kick" final testing of 7.75 is higher than the initial testing with a 6.9 average progress is an increase by 0.85 or 12.31%.

Technical test "hit the ball in corner" final testing of 8 is higher than the initial testing with a 6.5 average, progress is an increase of 1.5 or 23.07%.

**Conclusions**

1. Assess the level of development of technical capacities senior footballers are in final testing better than the initial testing. Statistical indicators on the progress recorded in the final test at a significance level of 0.05.

2. There is positive transfer to executive power and precision, both hitting, ball of foot, head, and the throw-in.

3. Following the application of technical training program conducted two weekly workouts and competitive pre competitive development was a top in the game, the team occupying the first half of the championship 1 ranking, higher place the previous year when he finished the championship 9th place.

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**Expérience sur la preparation des techniques footballeurs juniors "A"**

***Mots-clés:*** *entraînement sportif, la programmation, un processus de formation, la performance, les objectifs, la formation technique.*

***Résumé:*** *Si l'expérience proposée et compétitifs basés sur une liste que nous avons conçu un programme expérimental de formation technique, les exigences de la partie.*

*Choisir ce mode de travail est nécessaire dans le jeu actuel, car la technique est efficace en fonction de l'espace et du temps de jeu d'entraînement. Dans ce contexte, le travail a été émouvant de voir comment la préparation technique du football senior.*
*Dans le match de football à la fois un entraînement physique et de la formation tactique et technique est importante. Nous ne pouvons pas avoir une formation technique, sans entraînement physique aussi ne peut pas avoir une formation tactique sans formation technique. Ainsi, nous avons conçu un programme expérimental de formation technique, les exigences du jeu, avec deux séances d'entraînement hebdomadaires réalisées pré équipe compétitive et concurrentielle de football senior "du Danube Galati".*

*Si l'expérience proposée et en choisissant la voie calendrier concurrentiel du travail était de voir comment changer la préparation technique des footballeurs âgés sont énoncés les objectifs de chaque composante, qui a été l'objet de recherches: l'établissement d'indices de volume d'entraînement, en indiquant la méthode; transmettant des données et des règles de contrôle de preuves. Après l'expérience se trouve transfert positif par la force d'exécution et de précision dans de frapper la balle avec les deux pieds.*

# SYSTEM "ALTATHLON"- ARM SENSORS APPLICATION

**Assistant Preda Carmen[1], Ph.D.,**
**Professor Niculescu Mugurel[2], Ph.D.,**
**Engineer Roşculeț T. Răzvan[3],**
**Professor Păcuraru Alexandru[1], Ph.D.,**
"Dunărea de Jos" University, F.E.F.S Galați[1]
University of Pitești[2]
S.R. L. Robotec Galați[3]

***Abstract:*** *Altathlon provides data acquisition on the equality of the athlete's hitting strength by using both hands, the limbs positions at the moment of passing, the spot where the ball hits the forearms, as well as the presence of the hold during each passs performed by the player during training.*
*The system proposed in the present paper, called,"Altathlon" , provides real-time assessment of the pass effected by the palyer , subsequently issuing a vocal message aimed at correcting the player's performance.*
*The vocal messages issued match the pass assessment, and may be the following:*
- ✓ *"Very well!";*
- ✓ *"Throw by the forearms third section!";*
- ✓ *"Stretch the elbows!";*
- ✓ *"Use both hands !";*
- ✓ *"Incorrect hold!";etc*

*The software thus conceived allows the subsequent analysis of the training efficiency and the player's evolution over time.*
***Key words****: volleyball, sensors , arms, system "Altathlon".*

**Introduction**

Optimising technique in volleyball constitutes a decisive step in achieving performance, therefore the instructional means and methods should be re-oriented, so that to lead to precision and consistency in execution as early as the primary stage of learning the technical element.

**Contents**

"ALTATHLON" is the system we proposed to be implemented as a means of computer-assisted training for athletes. Essentially, the system allows the computer-assisted correction of the specific moves of the events, procedures or sporting techniques, which may be implemented in various stages of the athletes' training.

To analyse the arm movements, it is necessary to fix several sensors on the player's arms. The application of these sensors on the arms requires the use of especially designed cuffs, taking into account the rules imposed by the methodology for learning the two-handed pass from below.

The learning methodology for the two-handed pass from below imposes the following rules:

- **Hitting the ball involves the two forearms simultaneously** – to this purpose resistive force sensors SFR (1) were applied on the arms, close to the wrist. They measure the force of hitting the ball by the arms. The pass is accurate only if the two measured forces are approximately equal in size.

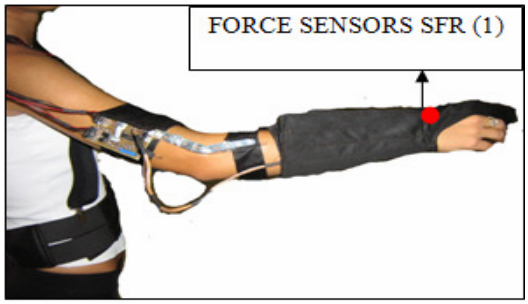


*Figure 1. Arm sensor application- resistive force sensors SFR (1)*

- **Hitting the ball is performed only in the forearm area close to the wrist** – in order to determine the correct position where the ball touches the forearm a resistive tactile sensor STR (2) was fixed along the cuff of the forearm. In order to signal the incorrect hitting of the ball using the palms, sensors SFR (3) were inserted on the plank near the first phalanx of the thumbs.

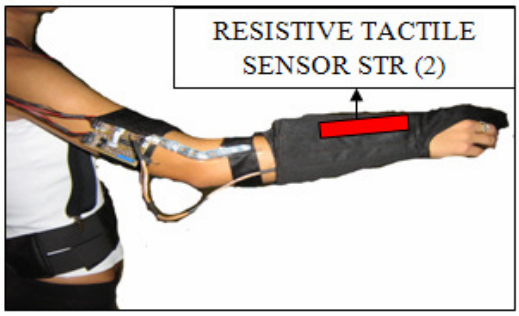


*Figure 2. Arm sensor application- resistive tactile sensor STR (2)*

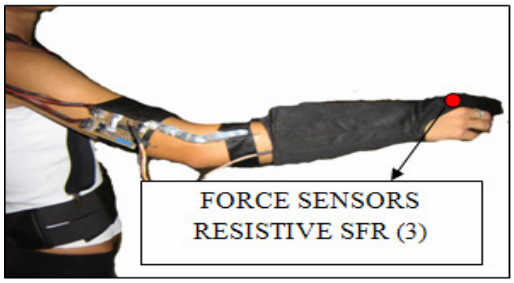


*Figure 3. Arm sensor application- Force sensors resistive SFR (3)*

- At the moment of hitting the ball, the elbows should be perfectly extended – to this purpose, resistive flexion sensors SFLR (4) were fixed near the elbows on the elbow cuffs in order to check if the elbow joint is stretched at the hitting moment.

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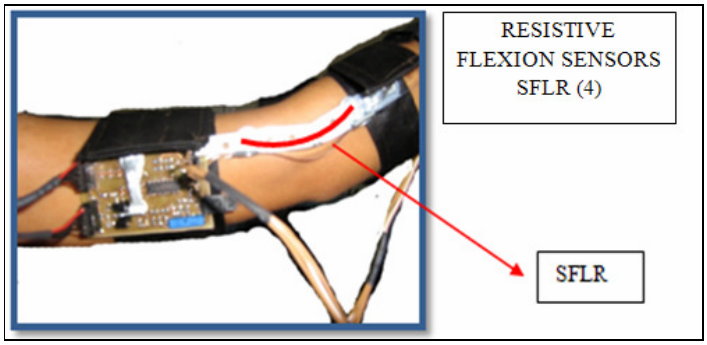


*Figure 4. Arm sensor application- resistive flexion sensors SFLR (4)*

• At the moment of hitting the ball, the arm should not get above the shoulders' level – in order to check this requirement, horisontal deviation sensors (5) were fixed on the arms to detect passes above the shoulders' level .

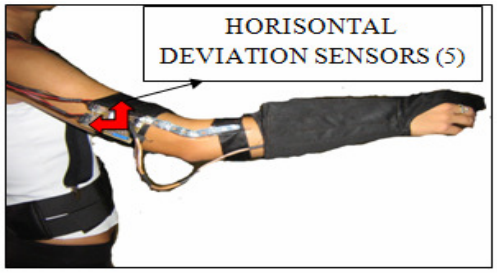


*Figure 5. Arm sensor application- horisontal deviation sensors (5)*

• At the moment of hitting the ball, the palms should present an accurate hold – this hold is detected by an electric contact (6) formed at the moment when the thumbs in both hands touch simultaneously one of the index fingers. To do so, the cuffs on the forearms have indented fingers where the contacts corresponding to the thumbs and index fingers were fixed.

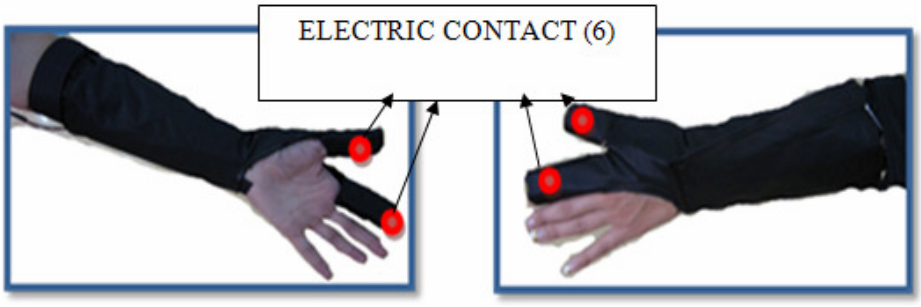


*Figure 6. Arm sensor application- electric contact (6)*

Keeping into account the technical characteristics of the sensors and the functions they should perform, in manufacturing the cuffs the following measures should be taken:

• To provide comfort during the training sessions, the cuff should be made of permeable and slightly elastic textile material. The cuff will consist of three layers of this textile material. The middle layer will contain the sensors;

• The sensors are fixed on a rigid prop (copper-plated glass textolyte) to provide the accurate measurement of the physical date of interest, and to protect the sensors which are extremely sensitive from a mechanic point of view, as they may break during the training efforts in case they are subject to strains on other directions than the ones they are designed for. The rigid props also provide a robust connection between the sensors' terminals and the cable connected to the circuit of measurement signal formation fixed on the elbow cuff;

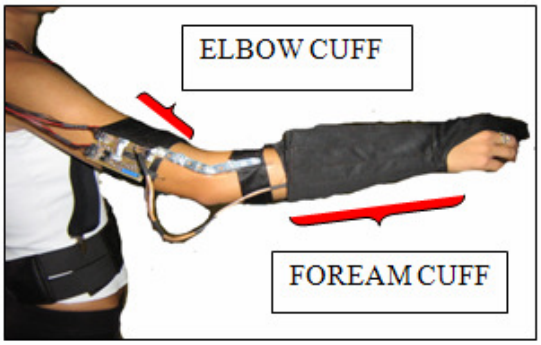


*Figure 7. Arm cuff application*

The terminals of the sensors that cannot fit on the rigid props are protected by inserting them between plastic sheets which provide an easy slide between the layers without creating dangerous mechanical strains in these terminals;

- The sensor props are fixed on the textile materials by rivets or press buttons to make sure that the sensors are stable in their correct position.

**Conclusions**

The proposed system used in training athletes learning the two-handed pass from below has the following functions:

- acquisition of data on the equality of forces with which the athlete hits the ball using both hands, limb positions at the moment of passing, the spot where the ball touches the forearms and the presence of hold in each pass performed by the player during training;
- Real-time assessment of the pass effected by the player;
- Sending back to the player of a vocal message aimed at correcting in training the performance of the accurate moves. It is to be remarked that generally athletes react very effectively to stimuli received through vocal messages;
- the post-analysis of the training efficiency and the player's evolution in time.

The data obtained in this manner are transmitted to a distance through a wireless medium (wireless radio) to a computer. The computer performs the real-time data analysis and send back to the player an answer of a vocal message type (the system's feedback-as an audio stimulus).

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**Le système , „Altathlon" -l'application des sensors sur les bras**

***Mots clés**: voley-ball, sensors, bras, le système ,''Altathlon''.*

*Altathlon assure l'acquisition des dates en ce qui concerne l'égalité des forces avec lesquelles le sportif frappe le ballon avec les deux mains,la position des membres en moment de passer le ballon,l'espace où le ballon frappe les antebras et la presence de la prise de chacune frappe effectuée par joueur pendant l'exercice.*

*Le système proposé par nous ,'altathlon''nous offre l'evaluation en temps real,de la frappe effectuée par le joueur e qui émet un message vocale qui a l' objectif de coriger le sportif.*

*Les mesages vocales sont émises en function de l'evaluation de la frappe et ceux sont:*

- ✓ *„ Très bien!";*
- ✓ *„Frappes le ballon avec le troisième bras!";*
- ✓ *„Les coudes écartés!";*
- ✓ *„Frappes avec les deux mains!";*
- ✓ *„Prise incorecte!";*

*Le logiciel développé permet une analyse plus approfondie de l'efficacité de la formation et le développement des joueurs au fil du temps.*

# STUDY ON THE DEVELOPMENT OF GENERAL MOBILITY ON CHILDREN WHO PRACTICE MARTIAL ARTS

**Assistant PhD candidate Gheorghe Pricop**
University Stefan cel Mare of Suceava

***Abstract**: Modeling the mobility of school age children is a sensitive issue, the material bibliography is not current in that direction. Topicality lies in the need to create development programs on*
*mobility and somatic motor adapted to the particularities of school age children using a wide*
*variety of means. The purpose of research is the process of modeling the mobility to martial artists, style Vovinam Viet Vo Dao, through the use of training programs by means of a general nature (in other sports) and specifically adapted to the peculiarities of age and development of children 6-8 years. The data obtained require a restructuring of how approach to sports training to young children, emphasis must be placed primarily on*

*developing and mobility general enrichment mobility baggage will become the foundation for training the next phases will focus the technical and tactical components of training.*
***Keywords**: mobility, children, Martial Arts.*

**Introduction**

Physical training is an integrated process and permanently present at all times and sports training periods. It aims to develop physical factors conditioning and performance coordinators (Weineck J., 1983, Pradet M., 2000).

Physical training means motor skills development, mastering a wide variety of skills and movement skills, and development of morpho-functional indices of the body, according to martial arts needs. Conceived in this way, physical training represents all morphological indices, neurovegetative and motor, to optimize of those we give the growth and psychomotor development (T. Bomp, 2002).

The importance of sports training for school age children (6-8 years) is subject to preparation of healthy individuals, well developed physically able to perform specific tasks everyday driving age.

Modeling the mobility of school age children is a sensitive issue, not current bibliographic material in this direction. Topicality lies in the need to establish capacity development programs tailored to the particular motor and somatic motor of school age children using a wide range of means.

Because martial arts is small selection of age (5-6 years), it is necessary to establish models that provide guidance for selecting children with real skills for practicing martial arts, then doubled a sports training adapted to the stage of development Athlete and its peculiarities.

The study was structured in the following sections: material-method (approach that leaves the premises in the study), results (presents analysis of the results) and discussions (presents the final conclusions of the study).

**Material method**

Research purposes it is the driving capacity modeling practitioners of martial arts, Vovinam Viet Vo Dao style, using training programs by means of a general nature (in other sports) and adapted to the specific features and development of children aged 6-8 years.

To achieve this research have established the following objectives:

- Identify components of the mobility that can be developed at the age of 6-8 years.

- Establish tests and samples to be assessed through which to evaluate the components of mobility.

- Analysis and result interpretation of ongoing research.

Longitudinal experiment measurements were performed between November 2008 - November 2009 by testing a total of 28 subjects by male sex (divided into two equal number groups, each 14) to evidence the training focused on mobility.

Longitudinal tests of the experiment took place in the sports training components of Suceava for the experimental group Iasi components respectively for the control group.

At the end of testing was performed statistical and mathematical plotted data on which conclusions were drawn and suggestions for how driving capacity development to be achieved in children 6-8 years of martial arts, Vovinam Viet Vo Dao style.

Testing of the basic experiment were performed as follows: initial testing - November 8, 2008, interim testing - 16 May 2009, final testing -November 14, 2009.

Testing of the experiment took place in Iasi and Suceava localities in which the subjects operate their sports training.

In carrying out preliminary experimental research have established the following working hypothesis: if we apply a series of tests and control tests in children 6-8 Vovinam Viet Vo years Dao practitioners we can determine the driving capacity of them.

In the present study was used to examine a complex approach various aspects of physical training of martial artists – style Vovinam Viet Vo Dao. Basic research direction was the establishment of specific training and physical peculiarities of practitioners aged 6-8 years the specific purpose of optimizing its martial arts.

In order to achieve the study were used following research methods:

- study of literature;
- teacher observation;
- type questionnaire survey method;
- samples and control tests;
- teaching experiment;
- statistical-mathematical method of data processing;
- graphic method.

Assessing mobility level general expression of the degree of development of each part and the driving qualities all together is through the 8 international test evidence of physical capacity of the International Federation for Physical Education (Let f) known as the "Standard Fitness Test".

The eight international test evidence of physical capacity are:

- Running speed 50 m
- Standing long jump
- 600m Running resistance
- Throwing the ball away from the place oina ball
- Maintaining a fixed position at the bar hanging
- Shuttle (picking potatoes)
- Lifting the trunk
- Coxo-femoral mobility

**Results**

In carrying out, the experimental research was conducted throughout the academic approach: development resources, planning, implementation and evaluation.

The evaluation process work done is necessary to achieve educational feedback to optimize the educational activity. In carrying out evaluation and test samples were applied to measure the capacity of general driving.

The initial testing (November 2008), results from assessment tests were as follows (table no. 1):

*Table no.1 General mobility assessment results from initial testing experimental and control groups obtained*

| TEST / Groups | Experimental Groups n=14 | Control Group n=14 |
|---|---|---|
| **General evidence** | | |
| Speed running 50 m (s) | 9.24 | 9.23 |
| Standing long jump (cm) | 143.07 | 143.57 |
| Running resistance (min) | 3.12 | 3.08 |
| Throwing the oina ball ball away from the place (m) | 16.34 | 16.39 |
| Maintaining a fixed position at the bar hanging (s) | 53.64 | 54.14 |
| Shuttle (s) | 12.81 | 12.88 |
| Trunk lifting ( repetitions number) | 17.21 | 17.57 |
| Coxofemural Mobility (cm) | 60.50 | 60.86 |

The values obtained are sensitive components of the two equal groups (differences between arithmetic averages evaluation samples were within 3%), which made it possible to conduct the experiment.

After 6 months (May 2009), intermediate testing, dynamic values obtained for the two groups under study was as follows (Table 2.)

*Table 2 The results of the general mobility assessment testing experimental group obtained intermediate and witness*

| TEST / Groups | Experimental Groups n=14 | Control Group n=14 |
|---|---|---|
| **General evidence** | | |
| Speed running 50 m (s) | 9.14 | 9.17 |
| Standing long jump (cm) | 146.64 | 145.93 |
| Running resistance (min) | 2.59 | 3.00 |
| Throwing the oina ball ball away from the place (m) | 16.70 | 16.68 |
| Maintaining a fixed position at the bar hanging (s) | 56.50 | 55.07 |
| Shuttle (s) | 12.58 | 12.64 |
| Trunk lifting ( repetitions number) | 19.07 | 18.64 |
| Coxofemural Mobility (cm) | 62.57 | 62.36 |

At the end of the experiment, after 12 months, overall sample results were as follows (table no. 3):

*Table 3 The results of general motor capacity assessment to final testing experimental and control groups obtained*

| TEST / Groups | Experimental Groups n=14 | Control Group n=14 |
|---|---|---|
| **General evidence** | | |
| Speed running 50 m (s) | 9.03 | 9.09 |
| Standing long jump (cm) | 151.79 | 145.93 |
| Running resistance (min) | 2.50 | 2.56 |
| Throwing the oina ball ball away from the place (m) | 17.18 | 17.02 |
| Maintaining a fixed position at the bar hanging (s) | 58.43 | 56.86 |
| Shuttle (s) | 12.43 | 12.48 |
| Trunk lifting ( repetitions number) | 20.29 | 19.79 |
| Coxofemural Mobility (cm) | 63.64 | 63.36 |

The results of transformation points (according to Annex no. 1) the general control samples is observed that the initial testing points difference between the two groups was 2 in favor of the control group, the

intermediate test difference was 10 points exprimentala favor, and the final difference increased to 21 points (Tables No. 4 and 4).

At the beginning of the experiment both groups were at the minimum scale (440 points) for Admission to the practice of sports: 445 p - the experimental group 447 - control group. At the end of research, in light of progress reached at the following values: 510 - experimental group, 489 - control group.

*Table 4 Transformation results in overall control samples in the experimental group points*

| TEST | Initial Test | | Intermediate Test | | Final Test | |
|---|---|---|---|---|---|---|
| | **Perf** | **Pct** | **Perf** | **Pct** | **Perf** | **Pct** |
| Speed running 50 m (s) | 9.24 | **61** | 9.14 | **63** | 9.03 | **65** |
| Standing long jump (cm) | 143.07 | **59** | 146.64 | **62** | 151.79 | **68** |
| Running resistance (min) | 3.12 | **45** | 2.59 | **56** | 2.50 | **64** |
| Throwing the oina ball ball away from the place (m) | 16.34 | **51** | 16.70 | **52** | 17.18 | **54** |
| Maintaining a fixed position at the bar hanging (s) | 53.64 | **55** | 56.50 | **59** | 58.43 | **61** |
| Shuttle (s) | 12.81 | **57** | 12.58 | **59** | 12.43 | **61** |
| Trunk lifting ( repetitions number) | 17.21 | **61** | 19.07 | **67** | 20.29 | **71** |
| Coxofemural Mobility (cm) | 60.50 | **56** | 62.57 | **61** | 63.64 | **66** |
| Total | | **445** | | **479** | | **510** |

*Table 5 Conversion of results from control samples overall points in the comparator*

| TEST | Initial Test | | Intermediate Test | | Final Test | |
|---|---|---|---|---|---|---|
| | **Perf** | **Pct** | **Perf** | | **Perf** | **Pct** |
| Speed running 50 m (s) | 9.23 | **61** | 9.17 | **63** | 9.09 | **64** |
| Standing long jump (cm) | 143.57 | **60** | 145.93 | **61** | 145.93 | **61** |
| Running resistance (min) | 3.08 | **47** | 3.00 | **54** | 2.56 | **59** |
| Throwing the oina ball ball away from the place (m) | 16.39 | **51** | 16.68 | **52** | 17.02 | **53** |
| Maintaining a fixed position at the bar hanging (s) | 54.14 | **53** | 55.07 | **55** | 56.86 | **59** |
| Shuttle (s) | 12.88 | **56** | 12.64 | **59** | 12.48 | **60** |
| Trunk lifting ( repetitions number) | 17.57 | **62** | 18.64 | **65** | 19.79 | **69** |
| Coxofemural Mobility (cm) | 60.86 | **57** | 62.36 | **60** | 63.36 | **64** |
| Total | | **447** | | **469** | | **489** |

After 12 months of experiment developments of the two groups (control and experimental) were as follows, in percentage expression:

- Running speed 50 m: experimental group - 2.32%, control group - 1.55%.
- The place long jump: experimental group - 6.09%, control group - 4.38%.
- Running resistance: experimental group - 8.19%, control group - 4.60%.
- Throw the ball away from the place oina ball: experimental group - 5.11%, control group - 3.88%.
- Maintaining a fixed position at the bar hanging: experimental group - 8.92%, control group - 5.01%.
- Shuttle: experimental group - 3.01%, control group - 3.11%.
- Lifting the trunk: experimental group - 17.87%, control group - 12.60%.
- Coxofemural Mobility: experimental group - 5.19%, control group - 4.11%.

The overall sample average progress obtained were 7.09% to 4.91% in the experimental group and control group.

To run the speed test at initial testing was left very close values (experimental group - 9.24 seconds, the control group - 9.23 seconds), and during the experiment was an upward evolution, and at the end of the

experiment has been progress in group experimental - 0.21 seconds, 0.14 seconds respectively to the witness.

Standard deviation values at the beginning of the experiment were 0318 seconds to 0317 seconds in the experimental group and control group, and at the end of our research were following values: experimental group - 0276 seconds, the control group - 0298 seconds.

In terms of coefficient of variation, it had the following values: experimental group (3.44% initiated testing, final testing, 3.05%) control group (3.44% initiated testing, final testing, 3.28%) - the basic observation is that by at the end of the research groups in the study were assigned to the high homogeneity.

Expression of a percentage between testing results and final page shows a progress of our experimental group 2.32% and 1.55% in the control group.

After applying the Student test between initial and final testing, the value of "t" for the experimental group was 1.91 (p> 0.05) and the control group "t" had a value of 1.55 (p> 0 , 05).

At the second trial of the experiment (long jump in place), the initial testing was a very small difference between the values of the two groups, namely 0.50 cm (experimental group - 143.07 cm, the control group - 143.57 cm).

At the end of the experimental research the difference between the two groups under study was as follows (experimental group - 151.79 cm, the control group - 149.86 cm) - 1.93 cm for the experimental group. In terms of developments, they were 6.09% of progress in the experimental group, 4.38% respectively in control group. After 12 months, the value of "t" in the experimental group was 4.18 for p <0.01, and the control group value of "t" was 2.70 for (p <0.05), which confirm the efficiency preparation used in training.

Standard deviation of the experimental group had the following values: initial testing - 5784, final testing - 5221, and the control group: initial testing - 6161, final testing - 6163. In terms of coefficient of variation, it had values indicating greater homogeneity in the experimental group (4.04%, 3.44%) and average homogeneity control group (4.29%, 4.11%).

When running the resistance to initial testing situation is similar to previous samples, the difference between the two groups being 4 seconds (experimental group - 3.12 minutes, the control group - 3.08 minutes). At the end of the experiment both groups were in progress (experimental group - 2.50 minutes, control group - 2.56 minutes).

In percentages, these advances have been achieved at the end of the experiment: 8.19% in the experimental group, 4.60% respectively in control group. After applying the Student test between initial and final testing, the two groups under study, we obtained the following values: t = 3.44 in the experimental group (p <0.01) and t = 1.55 (p> 0.01) in group witness.

On the coefficient of variability, it has values that fall within the high homogeneity for both groups (experimental - 8.71% and 1.97%, March - 8.56% and 7.45%).

The sample of oina ball throwing distance of the place was noted a difference in initial testing between the two groups of 5 cm (experimental group - 16.34 m, the control group - 16.39 m). At the end of 12 months of experimental research, experimental group progress was 84 cm (17.18 m), while the control group of 63 cm (17.02 m).

The percentage expression occurred following values: progress in the experimental group of 5.11%, 3.88% respectively in control group, between initial and final testing.

Values of "t" were 2.39 (p <0.05) in the experimental group and 2.02 (p> 0.05) for control group, between initial and final testing

Regarding the coefficient of variation, it records values indicating greater homogeneity in both groups between initial and final testing (experimental - 5.93% and 5.13%, March - 5.09% and 4.87%).

Experimental group is probably the most progress achieved and the value of "t" confirm this (t = 4.39) for p <0.01, and the control group "t" was equal to 3.48 for p <0 , 01. In terms of coefficient of variation, homogeneity showed that medium and large experimental groups (10.97% and 8.95%) and controls (10.40% and 7.72%).

The last test of general - coxofemural mobility difference was noted between the two groups of 0.36 cm (experimental group - 60.50 cm, the control group - 60.86 cm) in initial testing. Progress of experimental group after 12 months was 3.14 cm, and the control group progressed to 2.50 cm (experimental group - 63.64 cm, the control group - 63.36 cm) (Figure no. 20).

The percentage expression occurred following values: progress in the experimental group of 5.19%, 4.11% respectively in control group, between initial and final testing.

Values of "t" were 1.79 and 1.46 in the experimental group to control group, both values are not significant at p> 0.05, between initial and final testing. The coefficient of variation showed values indicating greater homogeneity in both groups between initial and final testing (experimental - 8.25% and 6.68%, March - 7.78% and 6.77%).

After applying the test "t" tests for assessing the mobility is seen as the experimental group achieved significant values 6 of the 8 samples of general motor capacity assessment (long jump on the spot, resistance running, throwing balls oina ball away from the place, keeping the bar hanging position fixed, shuttle, lifting the torso) and a control group received three significant values (long jump on the spot, shuttle, lifting the torso).

The values obtained are presented in Table. 6.

*Table 6 The results obtained from applying the Student test and control groups for experimental tests of general motor capacity assessment between initial testing and final testing*

| Test / Group | Speed running 50 m | Standing long jump | Running resistance | Throwing the oina ball ball away | Maintaining a fixed position at the bar hanging | Shuttle | Trunk lifting | Coxofemural Mobility |
|---|---|---|---|---|---|---|---|---|
| Grupa experimentală | 1.91 (p>0,05) | 4.18 (p<0,01) | 3.44 (p<0,01) | 2.39 (p<0,05) | 2.30 (p<0,05) | 2.82 (p<0,05) | 4.39 (p<0,01) | 1.79 (p>0,05) |
| Grupa martor | 1.23 (p>0,05) | 2.70 (p<0,05) | 1.55 (p>0,05) | 2.02 (p>0,05) | 1.26 (p>0,05) | 2.68 (p<0,05) | 3.48 (p<0,05) | 1.46 (p>0,05) |

**Conclusions**

The conclusions of the study presents the sequential approach of scientific research.

Use in training programs for capacity development motive (basic driving qualities, combined sports-specific, application-utility motor skills, sports-specific) have contributed to the enrichment of practitioners motric fund through the acquisition of new motor actions, strengthen the existing and developing motor qualities required for the development of motor acts and actions.

Through training lessons applied in the experimental group have developed basic driving skills and combined and formed new skills, mainly in the category of utility applications (crawl, climb, climbing, carrying loads, hauling, pushing, balance) and sports-specific (school running, jump, throw, basic elements of gymnastics, basic elements of the type adapted mini sports games, dance steps).

Created and implemented training programs in subjects contain experimental group of general and specific ways that have ensured the development and enrichment of luggage mobility of children. This is confirmed by results obtained from control samples (general and specific) applied during the carrying out experimental research. The results from initial testing indicate progress and final percentage between 2.32% and 92.35%.

Training programs used in the experimental group subjects had as objective the development of motor skills in various specific manifestations age 6-8 years (speed of response to visual stimuli, auditory and tactile, speed of execution in driving individual action, speed; coordination capabilities, segmental dynamic force, joint mobility), basic motor skills (walking and running variants, variants jumping, throwing and grip options in place), utility applications (balance, crawl, climb, climbing, pulling, pushing , carrying loads), basic motor skills sports (athletics, gymnastics, sports games, dynamic games, dance, sports season, fighting sports).

Because training programs applied in the preparation of experimental group subjects, the overall evidence obtained significant values, after analyzing data on student test for materiality $p < 0.01$ in the long jump tests in place, running resistance and lifting the trunk, ie the threshold of significance $p < 0.05$ for samples oina ball throwing balls, keeping the bar hanging position fixed commute. Also there were obtained from samples insignificant 50 m running speed and coxofemural mobility.

The data obtained require a restructuring of the approach to sports training to young children, emphasis must be placed primarily on the development of motor ability and general enrichment mobility baggage will become the foundation for the next phase of training that will focus on the technical components and tactical training.

The basis of physical training at 6-8 years is to achieve the best possible efficiency and initiation in the style practiced technique.

Optimizing training concept should highlight the unity of thought and action, which must be the coaches' attention and prospective directions that should be part of the preparation in children.

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## Étude sur le développement des capacités de conduite générale sur les enfants qui pratiquent les arts martiaux

***Résumé**: La modélisation des capacités de conduite des enfants d'âge scolaire est un sujet sensible, le materiel bibliographique n'est pas au courant dans cette direction. Actualité réside dans la nécessité de créer des programmes de développement de la capacité de conduire et des somatiques moteur, adaptés aux particularités des enfants d'âge scolaire en utilisant une gamme variée de moyens. Le but de la recherche est le processus de modélisation de la capacité aux practicants d'arts martiaux du style de conduite Vovinam Viet Vo Dao, grâce à l'utilisation de programmes de formation par le biais d'un caractère général (dans d'autres sports) et spécifiquement adapté aux particularités de l'âge et le développement des enfants 6-8 ans. Les données obtenues nécessitent une restructuration de la façon dont l'approche à l'entraînement sportif pour les jeunes enfants, l'accent doit être mis principalement sur le développement et la conduite des bagages d'enrichissement capacité générale motric deviendra le fondement de la formation des prochaines phases porteront les composantes techniques et tactiques de la formation.*

***Mots-clés**: capacité de conduite, enfants, Arts martiaux.*

# STUDY REGARDING EFFECTIVENESS OF USING GENERAL MEANS FROM GYMNASTIC IN TRAINING OF STUDENTS IN GYMNASIUM TO INCREASING QUALITIES OF FORCE

**Talaghir Laurentiu-Gabriel**[11], Lecturer PhD,
**Manolache Gabriel**, Lecturer PhD
**Mereuță Claudiu**[1], Lecturer PhD,
**Iconomescu Teodora Mihaela**[1], Assistent PhD
1. The Faculty of Physical Education and Sports Galati, "Dunarea de Jos" University

**Abstract:** *Physical education in school is a discipline with many formative valences. Maybe for that reason, physical education, is present in all level of education.*
*Development of motor abilities, improving indices of motor qualities, formation of special skills from different sports or education of behavioral acts and a moral qualities or qualities will , are some direction wich physical education try to influence*
*Gymnastic, like a part of physical education process, offer many means to the specialists which to determin realising the objectives of physical education to physical developement for youth*
*Because in daily activities as well as those sporting, succes of the proposed action is linked of sufficient development of motor qualities of force, we wanted to study if systematic use of exercises for general physical development can improve the signs of manifestation of this quality, in secondary cycle, especially in eighth grade*
***Key-Words****: physical education, gymnastics in school, overall force.*

**Itroduction**

Motor skills are features of the body materialized in ability to perform movement actions with some indices about speed, handiness, endurance and force. Motor skills have a nativ character whose initial manifestation level depends on the genetis suport which in hereditary.

Their further development as driving skill training are realised along with the process of growth and development, being influnced by the specific of activities, life condition, heredity, environment and activities at school (Ardeleanu, T., 1982; Mitra GH., Mogoş AL, 1975; Dragnea, A., 1991).

The motor skills are inherent and undergo a constant process of adaptation, depending on the motor activities carried out by humans throughout life.

The activity of school physical education aims to improve these skills in their entirety, since the rise of their manifestation degree will offer students grater possibilities in order to adress the tasks of everyday life (Badiu, T., Ciorbă, C., 1999; Carp, I, 2006; Scarlat E., 1993).

Also, a better manifestation of motor skills leads to the possibility of addressing more specific or utility-applicative skills, which is in itself an objective for the "Physical Education" discipline (Badiu, T., Ciorbă, C., 1999; Rață G., 2004; Şerbănoiu S, 2004).

**Purpose**

From these skills, our study followed the possibility of improving the strength skills. As a result, we assumed that exercise programs using general physical development, additionally placed in physical education lessons, will lead to the development of general strength in boys.

**Methods of research** In the testing method we chose four samples showing the evolution of power indices in all body segments. Mathematical statistic methods were used to highlight the high degree of certainty what is the difference between the results obtained by the two groups and whether these results are significant. Graphic representation was used to play as synthetic developments of the two groups involved in research.

**Content and results**

For that, we made an initial testing which wanted to mark out what was the level of physical training of the boys in the eighth grade. The events on which they were tested are included in the national system of evaluation for this age level.

The test was made on two groups of pupils, one being the control group and the other the experiment group. The results obtained on this test are reprezented in table number 1.

*Table 1*

| Test events (initial tests) | Control group $\bar{x} \pm m$ | Experiment group $\bar{x} \pm m$ |
|---|---|---|
| Bending and streching of the arms with the legs suported on the bench | 7,10±0,14 | 7,21±0,16 |
| Tractions from hanging (reps) | 2,56±0,38 | 2,47±0,35 |
| Long jump from standing still (cm) | 165,50±2,38 | 165,87±1,82 |
| Simultaneous lifting of the trunk and legs (number of reps) | 6,48±0,16 | 6,67±0,14 |

As it can be seen from the centralization of these results, the level of physical training of the two groups is close. This is a natural thing because pupils in both groups have covered the obligatory school programme in a similar manner and so the improvement of their strength skills recorded the same constant.

The differentiation between the two groups consisted of the fact that the witness group kept on covering the same activity in the lessons of physical education just it was planned, where as with the experiment group a complex of general physical development exercises mostly oriented towards the development of strength skills were undertaken.

This complex of exercises followed the analitic processing of corresponding body segments and muscle groups through repeated and isolated practice.

The appliance of the additional system of exercises was made during the lesson of physical education, throughout the first semester in the school year and had a ten to twelve minutes duration.

At the end of the semester a new test was made, with a final character, of both groups involved in the research. The standard measurment of the studied sample wanted to highlight the dynamics of the stregth skills development as a component of general physical training in the secondary cycle for pupils in the eighth grade.

The results of these tests are presented in table no. 2

Table 2

| Test events (final tests) | Control group $\bar{x} \pm m$ | Experiment group $\bar{x} \pm m$ |
|---|---|---|
| Bending and streching of the arms with the legs suported on the bench | 8,95±0,20 | 10,21±0,15 |
| Tractions from hanging (reps) | 3,94±0,35 | 9,93±0,57 |
| Long jump from standing still (cm) | 175,63±1,80 | 191,13±1,56 |
| Simultaneous lifting of the trunk and legs (number of reps) | 8,81±0,16 | 9,29±0,13 |

The reported results, in general from the final tests, intended to confirm that the systematic practice of exercise as a whole, contribute to higher levels of motor expression of the pupils.

This can be seen from the fact that both groups have recorded better results as opposed to the initial tests. Moreover, this was predictable, since the instructive - educational process held exercises anyway favorable effects on pupils involved in it. Enlightening for significant improvement of strength skills, by the influence of practicing gymnastics means under the form of complex additional exercises, was the comparison of the final results with each other in the control and experiment group. From this comparison it can be seen that the experimental group showed better results compared to the control group in all final tests.

Thus, in the case of the "Bending and stretching of the arms with the legs supported on the bench" event, unlike the initial test which showed close values of the strenght skills at the arm level, the control group registered a progress of 26,05% in the final test, where as the progress of the experiment group was 41,60% in the same event.

Spectacular growth of the progress of the experiment group as opposed to the control group was registered in the "Tractions from hanging" event. The progress of the control group of 53,90% is one that can be considered to be very good, which proves the fact that exercise during the lessons of physical education has beneficial effects on the general physical training.

However, the experiment group recorded a progress of over 300% in the same event, representing an increase of two and a half times higher than the control group. This confirmes the fact that the development of strenght mobility skills by practicing gymnastics exercises complex fully favors their development.

A progress of 6,12% recorded by the control group can be seen in the "Long jump from standing still" event. For the same one, the progress of the experiment group is 15,22%. By comparing these final results and the recorded progress of the two groups you can see that the result is superior in the case of the experiment group.

The last event used in the tests was the "Simultaneous lifting of the trunk and legs ". In this event the results were rather close in the sense that the control group recorded a progress of 35,95% in the final test and the experiment group recorded one of 39,28% in the same test. These results indicate a very good trunk muscle tonus, a fact very important for the posture attitudes in this period of age.

**Discusions and conclusions:**

The study conducted found that the targeting of physical training of pupils towards exercises that develop strenght mobility skills had the desired effect. We believe that this skill improvement is beneficial for the process of school physical education but also for the overall activity of the individual as a whole.

After comparing the results obtained in the tests, it can be said that by practicing systematic of the means of general physical development of gymnastics school, students can significantly improve the qualities of force.

This is a good prerequisite for expanding the motor activities to other more superior, thus integrating the students better in everyday activities.

The results of the experimental group are significantly better than those obtained from the control group, which makes us abble to appreciate that, the introduction of a program with simple gymnastic exercises, aimed at developing strenght mobility skills have positive effects.

Without this skill the time to learn or consolidate motor skills should be greater or even lack of interest in actual activity of physical education may occur when the student is always in a position of being unable to perform the proposed tasks.

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**Etude sur l'efficacite de l'utilisation des principes generaux de la gymanstique dans la preparation des eleves du cycle secondaire pour accroitre leurs qualites de force**

***Résumé:*** *L'éducation physique scolaire est une discipline à multiples valences formatrices. Pour cette raison peut-être, elle est présente à tous les niveaux de l'éducation.*

*Le développement des compétences motrices, l'amélioration des indices de manifestation des qualités motrices, le développement des compétences particulières nécessaires dans diverses activités sportives ou la formation par l'éducation de certains comportements et qualités morales ou volitives représentent quelques directions sur lesquelles l'éducation physique essaie d'exercer ses influences.*

*La gymnastique, en tant que partie composante du processus d'éducation physique, fournit aux spécialistes des moyens pour atteindre les objectifs de développement physique.*

*Puisque, dans les activités quotidiennes et sportives, la réussite des actions est liée au développement approprié des qualités motrices de force, nous voudrions mettre en évidence si l'utilisation systématique des exercices de développement physique général peut améliorer les indices de manifestation de cette qualité chez les élèves du cycle secondaire.*

***Mots clés****: éducation physique, gymnastique scolaire, force générale.*

# A COMPARATIVE STUDY OF GRAPHICAL METHODS FOR DETERMINING THE ACTIVE AREA OF THE HUMAN UPPER LIMB

**Marian Tudoran, Claudiu Mereuta, Daniel Ganea, Elena Mereuta**
"Dunărea de Jos" University of Galati, Romania

***Abstract:*** *The paper presents two methods for determining the active space of the human upper limb in the sagital plane using the facilities offered by AutoLISP programming environment, thus providing an alternative to the well-known analytical methods, which are often difficult. The paper presents also, a virtual model of the human upper limb, using the CATIA facilities, to simulate the motion during an athletic event, namely the sprint.*

***Keywords:*** *human upper limb, active space, kinematic model, simulation, virtual model, sprint.*

## Introduction

This article aims to determine the active area of the human upper limb in the sagital plane. Active area can be used to specify the trajectories of characteristic points for measuring specific range of motion in various human activities.

Based on a simplified kinematic chain of the human upper limb, consisting of four simple joints for the shoulder, the elbow, the wrist and the metacarpal-phalanges joint and based on anthropometric data from literature, it aims to determine the active area of the human upper limb in the sagital plane, using graphical method for establishing the successive positions. This paper presents two methods for determining the human upper limb active space and the contour curve.

The proposed graphical methods for determining the successive positions of the upper limb, based on graphical features of AutoLISP programming environment, presented below, are alternatives to the well-known analytical methods.

Also, this paper presents a virtual model of the human upper limb, for simulating the motion during athletic events, such as speed running, using CATIA features.

**Graphical methods for determining the active space**

**1. The points method**

In order to get the trajectory for all important joints of the upper limb (fig.1), we have elaborated an AutoLISP program that uses the main function loop "while", four times, one for each segment (rigid body) of the kinematic chain.

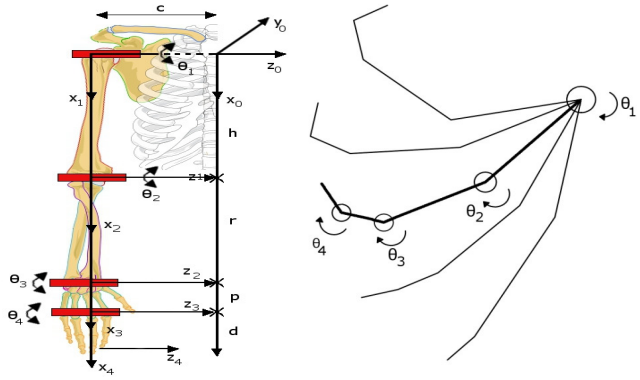


*Fig. 1 - Kinematic chain of the human upper limb*

Considering that the increment of all angles of the simplified human upper limb kinematic chain (fig.1), $\theta_1$, $\theta_2$, $\theta_3$, and $\theta_4$ is 5°, and according to the drawing principle scheme (fig.2), after running the AutoLISP program, in the AutoCAD current file a number of 824180 points was produced, which represent the active space in sagittal plane of the human upper limb, (fig.3).

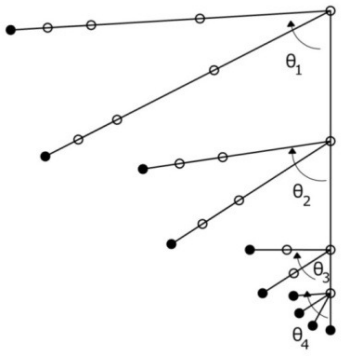


*Fig. 2 -Drawing principle scheme*

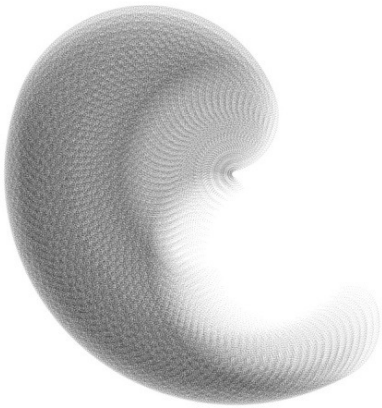

*Fig. 3 - Active area of the human upper limb*

**2. The contour curve plotting**

In order to determine the contour curve that close the cloud of points, we have achieved an AutoLISP routine, tailor made for such problem. This routine is based on scanning the space that must be large enough to contain all previously generated points (fig.4a). The identification process consists of crossing the area to be scanned using a mobile region, called collimator. The collimator must be small enough to find a single point in its interior and must be big enough so it doesn't pass through points which belong to the border.

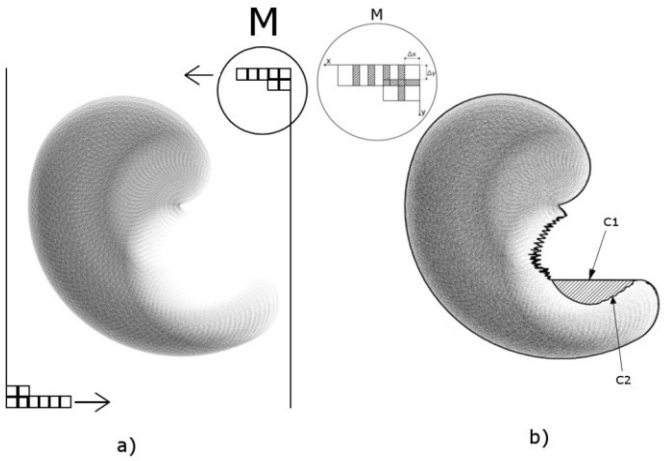


*Fig. 4 The contour curve plotting*
*a) - The principle of tracing the contour curve by scanning the active space;*
*b) - mistaken identity.*

Considering the collimator as 0.5 mm four-square shape, we were able to get the curve $C_1$, (fig.4b), which contains 3190 border points. The method was detailed in [8].

### 3. The circles method

Another proposed method for tracking the contour curve that defines the borders of the active space of the human upper limb in the sagital plane, assumes that circles are drawn instead of points.

In order to achieve that goal, we replace the point command with circle command and the AutoLISP program, designed according to the flow-chart shown in fig.5a, will provide the cloud of circles (fig. 5b).

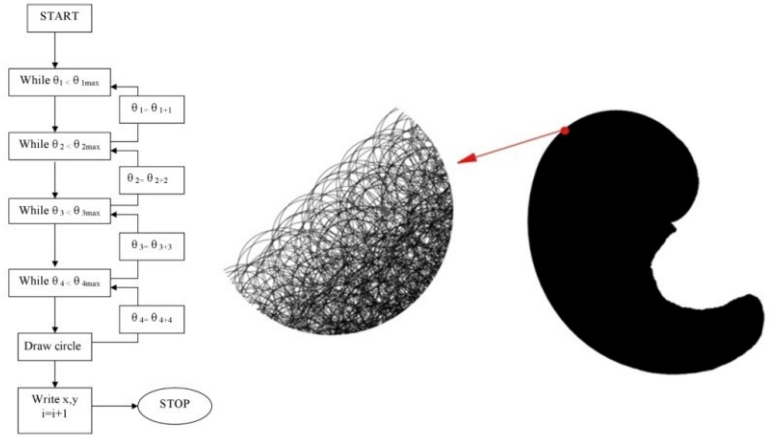


*Fig. 5 a) – Flow-chart; b) – Detailed cloud circles*

This method can be regarded as a viable option for the points method. This time it is not necessary to use the identification routine, because the calculus routine ends with two other commands that track automatically the contour curve. The first command is "region" which transforms all circles into regions, the second command is "union" which joins all previous regions into a single one, the contour curve.

We have run the program using different values for the circle radius and concluded that:

- when the radius is decreasing, the contour curve outlines a discontinuous surface;
- when the radius is increasing, the contour curve outlines a continuous surface, having a larger area than the real active space of the human upper limb.

We can conclude that the circle radius must be large enough to provide a continuous surface and, at the same time, sufficiently small to minimize the identification errors.

Considering that the radius of the circle is 0.5 mm, we get the curve $C_1$ (fig. 6) while the real contour curve is the curve $C_2$. Thus, the deviation from the real curve is about 1.028%.

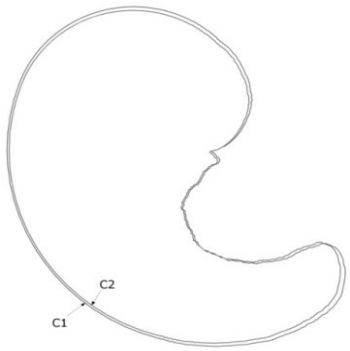


*Fig. 6 - The real contour curve ($C_2$) and the alternative curve ($C_1$).*

**Virtual model and simulation**

**1.Fundamentals of the speed running**

During the running process, due to the powerful extension of each leg at a time (one leg after the other), the body is pushed in the air and then returns on the ground, on the opposite leg.

During the running process we can emphasize a continuous succession of identical units, called running steps. This succession ensures the cyclical nature of this way of locomotion.

The unit of running cycle is the running step, which can be considered in two forms: the simple running step - useful for the technical interpretation of running and the double running step, which is important for the biomechanical analysis of running.

Besides the legs, the upper limbs assist in the running process. Once the race is started, both upper limbs help to fast impulses. Thus, the arm from the front leg, bent at an angle of about 90 degrees is brought vigorously forward and upward, while the opposite arm, bent at the same angle, is strongly pulled back down.

Thus, during the 100m speed running, it will be perfect if the upper limbs will move as follows (fig.7):

a) in the shoulder joint:

• when the arm is brought backwards, the angle to the front plane being 42°;

• when the arm is brought forward, the angle to the front plane being 40°.

b) in the elbow joint:

• when the forearm is brought backwards, the angle to the arm being 120°;

• when the forearm is brought forwards, the angle to the arm being 90°.

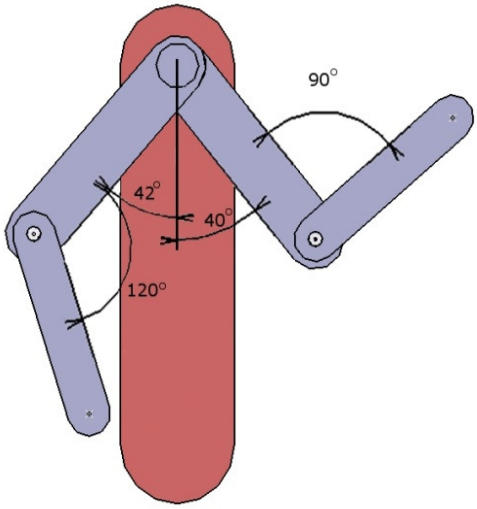


*Fig. 7- Upper limb flexion and extension*

**2. Simulation**

This simulation aims to determine the active space of the upper limb during 100m speed running. The kinematic simulation was computed using CATIA features and was based on a reduced model of the human upper limb.

Because the orientation of fingers and palms varies from one athlete to another, the reduced model consists of only three joints of the upper limb, the shoulder, elbow and wrist joint and three segments: the trunk, the arm and the forearm.

The model was carried out considering the following assumptions:

• The trunk is fixed during the simulation;

• The arm is connected to the trunk through a simple rotation joint, rotating in the range [-42°, 40°], following a linear law of motion;

• The forearm is connected to the arm through a simple rotation joint, rotating in the range [120°, 90°], following a linear law of motion.

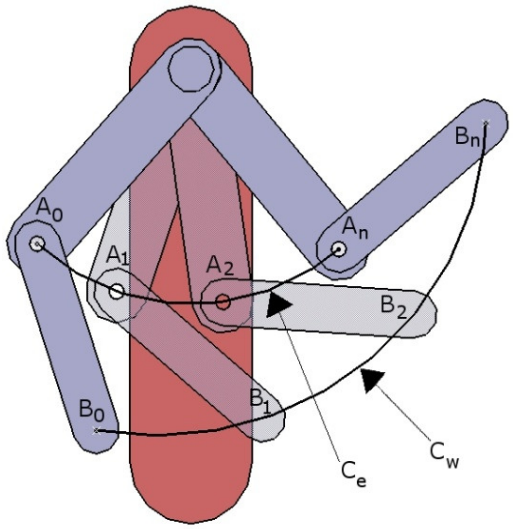


*Fig. 8 – The trajectories of elbow and wrist joints*

The simulation provides two curves that describe the trajectories of the joints of interest (fig.8):

• Ce curve - the trajectory of the elbow joint;

• Cw curve - the trajectory of the wrist.

## Conclusions

The points method is time consuming method because it requires loading, respectively, running two AutoLISP programs. But the advantage of using it consists of providing the coordinates of all points of the contour curve.

The circles method is faster than the points method, but the disadvantage consists of the fact that we can't determine the coordinates of the contour curve of the active space of the upper limb.

The data obtained by these graphical methods, the coordinates of the points determining the contour curve can be used as input data for ergonomics issues, for designing sports equipment, for determination the range of motion and the configuration of arm while throwing bowling ball, releasing the curling stone, throwing the ball at handball, running tests.

The data obtained from these simulations might be considered as the starting point in analyzing the behaviour of the upper limbs while 100m speed running. Thus we can improve the paths that deviate from this ideal model.

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## Une étude comparative des méthodes graphique pour determiner l'espace actif du membre supérieur humain

***Résumé***. *L'article présente deux méthodes pour déterminer l'espace actif du membre supérieur humain dans le plan sagittal en utilisant les facilités offertes par l'environnement de programmation AutoLISP, offrant ainsi une alternative aux méthodes analytiques bien connues, qui sont souvent difficiles. Le document présente également, un modèle virtuel du membre supérieur humain, en utilisant les fonctionnalités de CATIA, pour simuler le mouvement pendant une manifestation sportive, plus précisément le sprint.*

***Mots clés***: *membre supérieur humain, un espace actif, modèle cinématique, simulation, maquette virtuelle, sprint*.

# THE INTERMEDIATE ROLE OF PSYCHOLOGICAL EMPOWERMENT IN THE RELATIONSHIP BETWEEN TRANSFORMATIONAL LEADERSHIP AND ORGANIZATIONAL COMMITMENT IN SPORT MANAGER'S VIEW POINT

**1- Sardar Mohammadi*, 2- Alireza Omidi**
1- Faculty Member of University of Kurdistan(PhD), Department of Physical Education and Sport Science, University of Kurdistan, Sanandaj, IRAN
2- Faculty Member of Shahre Kurd University (PhD), Department of Physical Education and Sport Science, Shahre Kurd University, Shahre Kurd, IRAN
**Corresponding author:* E-mail: sardarmohammadii@gmail.com

***Abstract:*** *The purpose of this study was to survey the intermediate role of psychological empowerment in the relationship between transformational leadership and organizational commitment from the sport managers' point of view. The population included 320 managers of Iranian sport organizations that as a whole were considered as the sample. Spreitzer's Psychological Empowerment Questionnaire, Meyer and Allen's Organizational Commitment Scale, and Bass's Multifactor Leadership Questionnaire were used in order to collect data. The data was analyzed by path analysis. Results indicated that there was a positive significant relationship between transformational leadership, organizational commitment and psychological empowerment. Transformational leadership explained a high variance in psychological empowerment and organizational commitment. Finally, psychological empowerment had an intermediate role in the relationship between transformational leadership and organizational commitment.*
***Keywords****: psychological empowerment; transformational leadership; organizational commitment; sport managers.*

**Introduction**

Human force is the most significant capital of the organizations. The more desired quality the capital has, the more successful, survival, and advanced the organization is. Therefore, there should be much effort for the qualitative improvement of the human forces. It is beneficial for both of the organization and the individuals. Improvement requires not only the specialized education but also attitude improvement and value modification. Organizational commitment is one of the most prominent attitudes [1]. Commitment is a kind of attitude and inner feeling towards an organization, vocation or a group (here a sport organization) that affects one's judgment, performance and loyalty to the organization. The extent of the members' loyalty (dependent on the nature of organization) influences organizational fate and survival. Involvement in issues such as humanity and finance increases importance of organizational commitment as twice as much [2]. Job experience and individual and organizational agents are the prerequisites for organizational commitment [1,2,3,4]. Leadership is one of the individual-organizational factors considered as the key factor in organizational commitment [5]. There are various leadership models and attitudes. Through selecting appropriate leadership style, managers can provide desired working atmosphere contributing to the enhancement of organizational commitment [4]. Transformational leadership is a kind of leadership style. Transformational leadership is an inspirational leadership for followers leading to high morale. The followers obey leader eagerly. They are committed affectively to organization [1].

Many research have revealed that organizational leadership is related to organizational commitment in different cultures and organizational systems [6,7,9,10,24]. Transformational leaders affect their follower's commitment by encouraging them to critical thinking, applying new approaches, involving them in decision making processes, stimulating loyalty and flourishing their personal potential abilities [13,12,11,20]. Transformational leaders can motivate followers to be engaged more in their affairs by encouraging them to find new ways to solve problems and manage challenges. This results in higher organizational commitment [10]. Organizational commitment is higher among the staff whose leaders encourage their participation in decision making and are eager to their progress [14,15,16]. Doherty and Danyl Chuck (1996), in a research done about transformational and transactional leadership and their effect on organizational commitment on 104 sport managers, showed that there was a significant relationship between the sport managers' transformational leadership and organizational commitment. Golshani (2010) also argued that there is a

significantly positive relationship between transformational leadership and organizational commitment [4].

Although, transformational leadership, conceptually and experimentally, has relationship with organizational commitment, few researches have argued the processes or the intermediate agents through which transformational leadership affects organizational commitment. Being aware of the fact that there would be various factors to interfere in the relationship between transformational leadership and organizational commitment, the present research studied the intermediate role of the psychological empowerment.

Spreitzer (1995) defines psychological empowerment as an increasingly internal job motivation that is revealed in the four feelings of meaning, competence, self-determination, and impact. It reflects the individuals' attitude towards his/her duty [8,27]. Mishra (1998) added confidence to considered factors and five key dimensions of empowerment were formed [25].

Competence is referred to the feeling of self-efficacy or to those kinds of personal skills that enables the individual to perform his duty successfully. Impact alludes to the feeling that a person believes he can affect the consequences of a task. Meaning is the value devoted to a vocational aim. It is the accordance between one's personal behavior, beliefs, values and vocational condition. Self-determination or selection points to the sense of independence in vocational decision making [21,29]. The sense of confidence means that the staff is sure to be behaved fairly [18,21].

Transformational leadership theory emphasizes on the psychological empowerment role as a central mechanism in bringing about organizational commitment to the organizational aims [8,22,30,31,32]. Wallace and Weese (1995) found that confidence among the colleagues and subordinates and meaning are intermediate agents in the association between transformational and transactional leadership with organizational commitment [30]. Lowe et al. (1996) said that transformational leaders modify the ideals, requirements, tastes and values through which the followers get to their complete potentials [23]. The followers of the transformational leaders are expected to recognize their leaders as the ones who could affect the organizations through improvement of psychological empowerment [25,26,34]. Transformational leaders involve followers in planning future and inspire them to be committed to that planning. Moreover, they create group coalescent through appeal, highly moral standards, honesty and optimism. They provide the feeling of meaning for their followers, and improve the level of self-efficacy, confidence and self-determination [21].

Avolio et al. (2003) showed that the followers whose leaders follow highly moral standards and expectations, optimism, and honesty work better and feel convenient and more potent to do their jobs successfully. Giving more chance and freedom in decision making, challenges and responsibilities leads to self-determination and even higher organizational commitment of followers [8].

Some researchers argued that empowered staff finds themselves more competent. They can affect job and organization valuably. So, they are expected to attempt more than determined duties, act independently and be more committed to organization [19]. So, the staff who feels to be empowered may be committed more to organization [21].

Thomas and Velthouse (1990) demonstrated that the empowered staff has higher concentration, creativity and flexibility resulting in increasing organizational commitment. In other words, the staff that is optimistic to job has higher commitment towards organization and feels more vigorous to work [29].

As considered, transformational leadership is positively related to attitudes and vocational behaviors on either individual or organizational level. But, there is a gap about the mechanisms and processes through which transformational leaders influence their followers' motivation and performance in management literature especially in the field of sport and physical education. The need to further attention in understanding the mechanisms and processes through which transformational leaders influence their staff' attitudes, is defined explicitly so that we could offer a better conception of the intra-organizational results of the transformational leadership in sport organizations. Therefore, sport organizations as the supporters of the sport require committed human force being loyal to the organization and its values to fulfill organizational ends. It is also influenced by the leaders' behavior in organizations. Under such atmosphere of the organization, both the aims of sport and physical education are fulfilled and the managers are contented with their staff's inspiration. Therefore, the experts as the most important sources of the organization fulfill their duties with high commitment to their organizational aims and their leaders. The purpose of this research was to study the intermediate role of psychological empowerment in the relationship between transformational leadership style and organizational commitment from the sport managers' view point. The theoretical framework applied in present research is shown in figure 1.

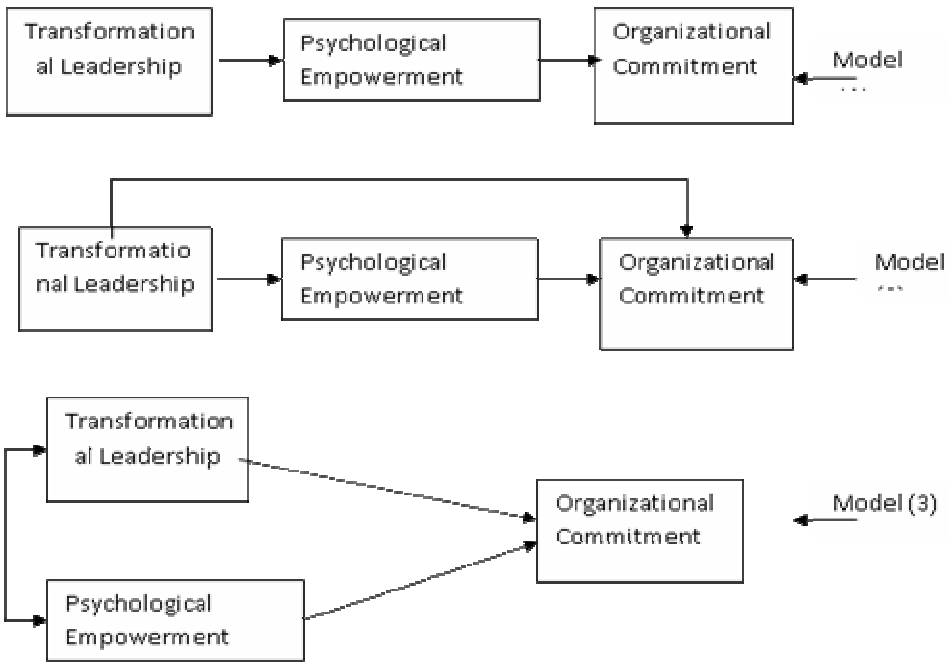


*Figure 1. Theoretical models of the research about the relationship between transformational leadership, psychological empowerment and organizational commitment*

**Methods**

The research was descriptive-correlative. We studied the relationship between psychological empowerment, transformational leadership, and organizational commitment through path analysis as a causal model.

*Participants*

The population was 320 subjects including all the managers in the physical education organization (87), general department of educational sport (71), and sport federations (162). All the population was considered as the sample. The selection of the mentioned organizations was because of their aims affinity and also accomplishment of the macro sport policies in the whole country.

*Measures*

Transformational leadership style was assessed using Multifactor Leadership Questionnaire (MLQ) Bass (1996). The MLQ contained 90 items tapping 13 conceptually distinct leadership factors and three leadership outcomes. Three leadership styles were transformational leadership, transactional leadership, and non-leadership (laissez-faire) leadership. However, in present research, a shortened form of questionnaire was used. Participants responded to 22 items using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). It composed of five subscales including intellectual stimulation, individual consideration, inspirational motivation, attributed charisma, and idealized influence.

Psychological empowerment was assessed using Psychological Empowerment Questionnaire Spreitzer (1994). Participants responded to items using a 7-point Likert agree-disagree scale. It composed of four subscales including job meaning, competence, self-determination, self-confidence. Organizational commitment was assessed using Organizational Commitment Scale Allen & Meyer(1990). Participants responded to 51 items using a 7-point Likert agree-disagree scale. It composed of three subscales including affective commitment, continuous commitment and normative commitment. Content and face validity were confirmed by 10(panel of expert). Moreover, item validity was approved by confirmatory factor analysis; Transformational Leadership Questionnaire (AGFI=0.967, df= 53, p=0.001), Psychological Empowerment Questionnaire (AGFI=0.987, df=74, p=0.001), and Organizational Commitment Scale (AGFI=0.910, df=169, p=0.001). Cronbach's α measured the reliability; Transformational Leadership Questionnaire (α=0.74), Psychological Empowerment Questionnaire, (α=0.78), and Organizational Commitment Scale (α=0.80). Age, kind of recruitment, job background, and educational level were considered as the controlling variables. Demographic variables are potential predictive of organizational commitment [29,30,31].

**Statistical analysis**

Descriptive statistics and inferential statistics (confirmatory factor analysis and path analysis) were used to analyze data by LISREL 8.52 and SPSS 18.

**Results**

Table1 indicates the mean, standard deviation and correlation between the variables. Meanwhile, the main variables of the research were distributed normally.

*Table 1. Mean, Standard Deviation and Correlation*

| Variables | SD± M | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| 1. Age (year) | 36.66± 5.87 | 1 | | | | | |
| 2. Gender (1=Male, 2=Female) | 1.56 ± 0.49 | 0.08 | 1 | | | | |
| 3. Education Level (1=Diploma, 2=Higher diploma, 3=B.A. , 4=M.A., and higher levele) | 2.90 ± 0.90 | 0.36** | 0.006 | 1 | | | |
| 4. Job background | 11.71 ± 2.62 | 0.78** | 0.04 | 0.27** | 1 | | |
| 5. Transformational leadership style | 41.36 ± 11.87 | -0.06 | 0.05 | -0.02 | -0.05 | 1 | |
| 6. Psychological empowerment | 64.70 ± 9.99 | -0.04 | 0.02 | -0.05 | -0.04 | 0.56** | 1 |
| 7. Organizational commitment | 69.78 ± 7.06 | 0.18 | -0.001 | -0.03 | 0.01 | 0.43** | 0.40** |

**p<0.01

Transformational leadership had a significant relationship with psychological empowerment (r=0.56, p<0.05) and organizational commitment (r=0.43, p<0.05). Moreover, psychological empowerment was related significantly to organizational commitment (r=0.40, p<0.05).

As the purpose of the present research was to study the intermediate role of the psychological empowerment in the relationship between transformational leadership and organizational commitment by path analysis, three models had been presented.

In the first model, empowerment had an intermediate role in the relationship between transformational leadership and organizational commitment. Also, transformational leadership had an indirect relationship with organizational commitment. Table 2 presents coefficients of direct and indirect effects, the total effect, and explained variance.

*Table 2. Coefficient of the direct and indirect effects, total effect, and explained variance*

| Path | Direct effect | Indirect effect | Total effect | Explained variance |
|---|---|---|---|---|
| transformational leadership style ↓ psychological empowerment | 0.54** | | 0.729** | 0.45 |
| psychological empowerment ↓ organizational commitment relationship | 0.35** | | 0.35** | 0.48 |
| transformational leadership style ↓ organizational commitment relationship | | 0.189** | | |

**p<0.01

As shown in table 2, transformational leadership had a directly significant positive effect on psychology empowerment (0.054). It also had an indirectly significant positive effect on organizational commitment (0.189). In addition, psychological empowerment had a directly significant positive effect on organizational commitment (0.35). Consequently, psychological empowerment had an intermediate role in the relationship between transformational leadership and organizational commitment. In other words, transformational leadership affected organizational commitment indirectly through psychological empowerment. Meanwhile, organizational commitment's explained variance in the present model was 0.48. Finally, regarding the parameters in the table 2, the model of predicting the sport managers' organizational commitment would be presented (figure 2).

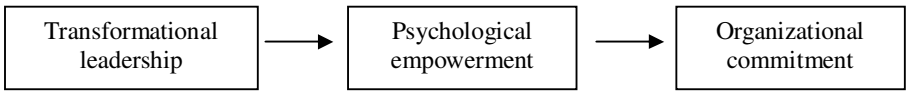


*Figure 2. Output path diagram for data in table 2*

In the second model, empowerment had an intermediate role in the relationship between transformational leadership style and organizational commitment. Furthermore, there was a direct relationship between transformational leadership and organizational commitment. In table 3, direct effect, indirect effect, total effect, and the explained variance are shown.

*Table 3. Coefficient of the direct and indirect effects, total effect, and explained variance*

| Path | Direct effect | Indirect effect | Total effect | Explained variance |
|---|---|---|---|---|
| transformational leadership style ↓ psychological empowerment | 0.54** | | 0.729** | 0.45 |
| psychological empowerment ↓ organizational commitment relationship & | 0.24** | | 0.250 | 0.53 |
| transformational leadership style ↓ organizational commitment relationship | 0.13** | 0.129** | | |

**p<0.01

As it was shown in table 3, transformational leadership had a directly significant positive effect on empowerment (0.54). Transformational leadership had a directly (0.13) and an indirectly (0.129) significant positive effect on organizational commitment. In addition, psychological empowerment had a directly significant positive effect on organizational commitment (0.24).
Therefore, psychological empowerment had an intermediate role in the relationship between transformational leadership and organizational commitment. In other words, transformational leadership affected organizational commitment directly and indirectly through psychological empowerment. Moreover, the explained variance of organizational commitment was 0.53. At last, according to the mentioned parameters in the table 3, the model of predicting organizational commitment of the sport managers would be presented (figure 3).

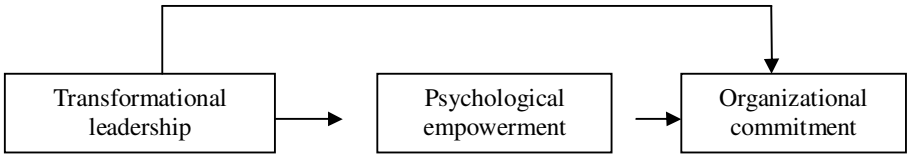


*Figure 3. Output path diagram for data in table 3.*

In the third model, transformational leadership and psychological empowerment as the intermediate variables affected organizational commitment. In table 4, the coefficients of direct and indirect effects, the total effect, and explained variances have been indicated.

*Table 4. Coefficient of the direct and indirect effects, total effect, and explained variance*

| Path | Direct effect | Indirect effect | Total effect | Explained variance |
|---|---|---|---|---|
| transformational leadership style ↓ psychological empowerment | 0.54** | | 0/729** | 0.45** |
| psychological empowerment ↓ organizational commitment relationship | 0.24** | | | 0.53** |
| transformational leadership style ↓ organizational commitment relationship | 0.13** | 0/129** | | |
| psychological empowerment ↓ transformational leadership style | | | | |

**p<0.01

As it was observed in table 4, transformational leadership had a directly significant positive effect on empowerment (0.54). Transformational leadership had a directly significant positive effect on organizational commitment (0.13). Moreover, psychological empowerment had a directly significant positive effect on organizational commitment (0.24). In addition, the explained variance of organizational commitment was 0.53. Considering the mentioned parameters in table 4, model of predicting the sport managers' organizational commitment would be presented.

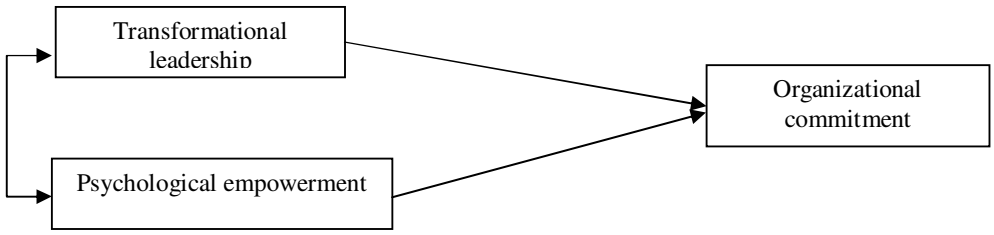


*Figure 4. Output path diagram for data in table 4.*

**Discussion and Conclusion**

The purpose of the present research was to study the relationship between transformational leadership and organizational commitment focusing on the intermediate role of psychological empowerment. Regarding theoretical and experimental background, three hypothetical models were suggested which were examined by path analysis method. The findings indicated two main points. First, there was a significant positive relationship between transformational leadership and organizational commitment regarding the intermediate role of psychological empowerment. The findings showed clearly that a major part of the explained variance in both psychological empowerment and organizational commitment resulted from transformational leadership. These results were in consistent with previous research referred to the positive relationship between transformational leadership and empowerment [9,11,12,13,22,30] and also the relationship between transformational leadership and organizational commitment [4,7,8,10,17,20,24,29].

The second result was referred to the issue that how transformational leadership affected psychological consequences regarding the fact that psychological empowerment had an intermediate role in the relationship between transformational leadership and organizational commitment. In this research, findings showed that difference in the levels of organizational commitment would be justified by difference in their feeling of empowerment to some extent. These results were in consistent with previous results [15,19,22,23]. Therefore, it seems that competent managers probably have high commitment toward their organizational goals.

Results of the research indicated that it's necessary for the sport organization managers to have more complete conception of the factors leading to organizational commitment. This issue concentrated on how the staff feels empowerment in their roles. Transformational leaders insist on the significance of the duties that the staff is engaged in. It seems that according to these results-empowering the staff, transformational leaders can trust their followers' ability. So, leaders can affect their followers' jobs significantly leading to the higher

commitment toward organization. Providing innovative ways to empower the staff –in general human force- is prominent. Therefore, transformational leaders should improve the managers' organizational commitment by planning proper methods of empowering the staff and their direct involvement in organizational affairs. Thus, regarding the formal role of the staff in sport organizations, sport managers are in charge of empowering their subjects to stabilize their goals and motivate them to achieve these goals.

The goals of transformational leadership are to transform the individuals and organizations by a powerful feeling to make change in their minds and heart, expand attitudes, clarify goals, behave in line with beliefs, values and principles and make permanent changes (such as rapid structuring and making changes in proper times). These affaires require positive view point, good starter, patience, reverence, persistence, admiration and believing transformational leadership. Transformational leaders have a major role in keeping and expanding the staff's organizational commitment. Transformational leaders not only have a strong conception but also transfer such conception to their staff. They create commitment and empowerment among their staff. As a result, the staff considers the leader's goal as theirs.

Some practical suggestions could be extracted from research findings. Leaders can have more positive effects on the organizational commitment if providing more empowerment. To increase the feeling of empowerment among the managers of sport organizations, the head of the organization should define his viewpoint clearly so that the staff undertakes responsibilities better. Clarifying responsibilities, roles and rewards may facilitate the feeling of empowerment among the staff. Also, understanding the staff's requirements creates a supporting atmosphere in psychological empowerment.

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## Le rôle intermédiaire de l'émancipation psychologique dans la relation entre le leadership transformationnel et l'engagement organisationnel en termes de gestionnaires du sport

***Résumé:*** *Le but de cette étude était d'examiner le rôle intermédiaire de l'habilitation psychologique dans la relation entre le leadership transformationnel et l'engagement organisationnel en termes de manager sportif. Les participants ont été de 320 au total, gestionnaires d'organisations sportives iraniennes que dans l'ensemble ont été considérés comme l'échantillon. Le questionnaire psychologique de l'autonomisation du Spreitzer, l'échelle de l'engagement organisationnel du Meyer et Allen, et le questionnaire multifactoriel sur leadership du Bass ont été utilisés afin de collecter des données.*

*Les données ont été analysées par analyse par régression. Les résultats ont indiqué qu'il y avait une relation positive significative entre le leadership transformationnel, l'engagement organisationnel et l'habilitation psychologique. Le leadership transformationnel a expliqué une variance élevée dans l'engagement de l'habilitation et de l'organisation psychique. Enfin, l'habilitation psychologique a un rôle intermédiaire dans la relation entre le leadership transformationnel et l'engagement organisationnel.*

***Mots-clés:*** *l'habilitation psychologique, le leadership transformationnel, l'engagement organisationnel, les gestionnaires du sport.*