

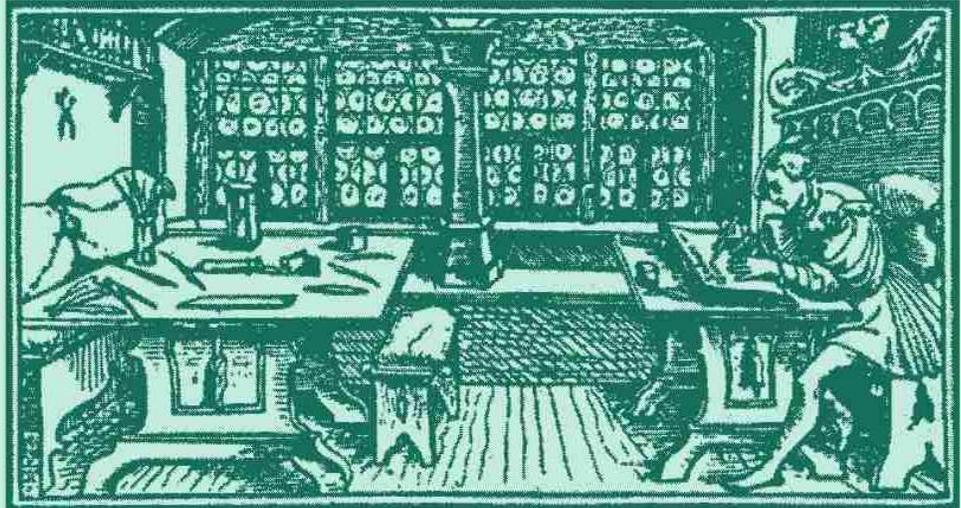
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## NUTRITIONAL STRATEGIES FOR OPTIMIZATION THE TREATMENT OF THE NEURODEGENERATIVE DISORDERS IN NON-ATHLELETES

LYGIA ALEXANDRESCU<sup>1</sup>, DJAMO OLGA<sup>1</sup>

**REZUMAT.** Strategii nutriționale pentru optimizarea tratamentului dereglărilor neurovegetative la nesportivi. Corpul reacționează în mod constant cu oxigenul în cazul proceselor de producere a energiei în celule. În consecință sunt produse molecule foarte reactive cunoscute sub numele de radicali liberi. Acestea interacționează cu alte molecule din cadrul celulei, fapt care cauzează distrugerea proteinelor, membranelor și genelor.

Scopul acestui studiu este să treacă în revistă asocierea dintre nutrienții antioxidanți și marcatorii stresului oxidativ cu anumite tipuri de reglări neurovegetative.

**ABSTRACT.** The body constantly reacts with oxygen as part of the energy producing processes of cells. As a consequence of this activity, highly reactive molecules are produced known as free radicals. These interact with other molecules within the cell, which can cause oxidative damage to proteins, membranes and genes. This damage has been implicated in the cause of neurodegenerative diseases and has an impact on the body's aging process. Hence diet-derived antioxidants may be particularly important in protecting against these diseases. Some antioxidants (e.g. ascorbate, certain flavonoids) can exert pro-oxidant actions in vitro, often by interaction with transition metal ions. The physiological relevance of these effects is uncertain, as is the optimal intake of most diet-derived antioxidants.

### Objective

The objective of this study was to review the association between antioxidant nutrients and markers of oxidative stress with certain types of neurodegenerative disorders.

### Background

Free radicals such as reactive oxygen species are formed during a variety of biochemical reactions and cellular functions (such as mitochondria metabolism). The steady-state formation of pro-oxidants (free radicals) is normally balanced by a

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similar rate of consumption by antioxidants. Oxidative stress results from an imbalance between formation and neutralization of pro-oxidants. Various pathologic processes disrupt this balance by increasing the formation of free radicals in proportion to the available antioxidants (thus, oxidative stress). Examples of increased free radical formation are immune cell activation, inflammation, ischemia, infection, cancer and so on. Free radical formation and the effect of these toxic molecules on cell function (which can result in cell death) are collectively called "oxidative stress." These free radicals are highly reactive, unstable molecules that have an unpaired electron in their outer shell. They react with (oxidize) various cellular components including DNA, proteins, lipids / fatty acids and advanced glycation end products (e.g. carbonyls). These reactions between cellular components and free radicals lead to DNA damage, mitochondrial malfunction, cell membrane damage and eventually cell death (apoptosis - which is the term for programmed cell death).

Free radicals are generally reactive oxygen or nitrogen species. Examples of free radicals (oxidizing molecules) are hydrogen peroxide, hydroxyl radical, nitric oxide, peroxynitrite, singlet oxygen, superoxide anion and peroxy radical. Superoxide is generated via several cellular oxidase systems (enzyme reactions). Once formed, it participates in several reactions yielding various free radicals such as hydrogen peroxide, peroxynitrite, etc. In turn, these can lead to chain reaction byproducts that also act to damage cells (example: lipid peroxidation products). An example of a very potent free radical is peroxynitrite which is 1000 times more potent as an oxidizing compound than hydrogen peroxide. Markers of peroxynitrite formation (such as nitrotyrosines or isoprostanes) can be found in many disease states including Alzheimer's brains, Parkinson's disease, chronic heart disease, liver disease, areas of inflammation, and so on. Thus, excess free radical formation is associated with many disease states. Inflammation, poor blood flow, degenerative diseases, and toxin exposures among other mechanisms all lead to oxidative stress.

A wide variety of diseases have evidence of excess generation of free radicals, oxidative stress and inadequate antioxidant activity. Some examples are neuro-degenerative diseases, heart disease, HIV disease, chronic fatigue syndrome, hepatitis, cancer, autoimmune diseases, etc.

Antioxidants are molecules or compounds that act as free radical scavengers. Most antioxidants are electron donors and react with the free radicals to form innocuous end products such as water. These antioxidants bind and inactivate the free radicals. Thus, antioxidants protect against oxidative stress and prevent damage to cells. By definition oxidative stress results when free radical formation is unbalanced in proportion to the protective antioxidants. There are many examples of antioxidants:

- Intracellular enzymes: superoxide dismutase (SOD), glutathione peroxidase
- Endogenous molecules: glutathione (GSH), sulfhydryl groups, alpha lipoic acid, CoQ 10, thioredoxin

- Essential nutrients: vitamin C, vitamin E, selenium, N-acetyl cysteine (NAC)
- Dietary compounds: bioflavonoids, proanthocyanidans

All cells have intracellular antioxidants (such as superoxide dismutase and glutathione) which are very important for protecting all cells from oxidative stress at all times. Glutathione (GSH) is very important as an intracellular antioxidant. GSH has been found to be low in many disease states (including virtually all those noted above) indicating oxidative stress and inadequate antioxidant activity to "keep up" with the free radicals. Maintaining and improving GSH levels may be important in these illnesses. There are several ways to increase GSH levels. GSH can be given as a supplement but it is not absorbed very well from the gastrointestinal tract (secondary to an enzyme that inactivates it). Cysteine is the main (rate limiting) precursor of GSH production. N-acetyl cysteine (NAC) is probably the best way to administer cysteine since it is more stable and is very effective in increasing GSH levels. Alpha lipoic acid and vitamin C both increase internal recycling of GSH, thus increase the GSH levels. GSH is important in the normal functioning of immune cells. Low GSH levels have been associated with impaired immune function. Decreased GSH impairs T cell proliferation and activation. Other abnormalities of immune function associated with decreased GSH levels are impaired IL-2 production, impaired IL-2 responses and a shift to TH2 response as compared to TH1. Restoring GSH levels to normal may be important in normalizing immune function. TNF alpha (a major pro-inflammatory cytokine) impairs GSH production by several mechanisms, resulting in lowered GSH levels. Furthermore, oxidative stress increases TNF alpha production. Therefore, GSH disturbances and enhanced TNF alpha production / activation lead to a pathogenic "loop" or vicious cycle.

### **Oxidative Stress in Neurologic Diseases**

Oxidative stress has been extensively studied in neurologic disease including Alzheimer's disease (AD), Parkinson's disease, multiple sclerosis, ALS, AIDS dementia and so on. This is not surprising since the brain (neural cells) is especially susceptible to oxidative stress and subsequent damage to cells (including cell death). In a disease such as Alzheimer's, oxidative stress / oxidative damage is felt to play a key role in the loss of neurons and the progression to dementia.

Antioxidants which effectively enter the nervous system, improve GSH levels, act as antioxidants themselves and are well absorbed from the GI tract would be ideal candidates for protection of the brain and nervous system from oxidative stress / damage. NAC, alpha lipoic acid and probably CoQ 10 fulfill such characteristics of these important properties. A prime example is the use of these antioxidants in the protection / prevention of Alzheimer's disease, Parkinson's disease and so on. Certain trace minerals are necessary for certain antioxidants to function (e.g. selenium and zinc).

Oxidative stress is now recognized as accountable for redox regulation involving reactive oxygen species (ROS) and reactive nitrogen species (RNS). Its role is pivotal for the modulation of critical cellular functions, notably for neurons astrocytes and microglia, such as apoptosis program activation, and ion transport, calcium mobilization, involved in excitotoxicity. Excitotoxicity and apoptosis are the two main causes of neuronal death. The role of mitochondria in apoptosis is crucial. Multiple apoptotic pathways emanate from the mitochondria. The respiratory chain of mitochondria that by oxidative phosphorylation, is the fount of cellular energy, i.e. ATP synthesis, is responsible for most of ROS and notably the first produced, superoxide anion ( $O_2^{\cdot-}$ ). Mitochondrial dysfunction, i.e. cell energy impairment, apoptosis and overproduction of ROS, is a final common pathogenic mechanism in aging and in neurodegenerative disease such as Alzheimer's disease (AD), Parkinson's disease (PD) and amyotrophic lateral sclerosis (ALS). Nitric oxide ( $NO$ ), an RNS, which can be produced by three isoforms of NO-synthase in brain, plays a prominent role. The research on the genetics of inherited forms notably ALS, AD, PD, has improved our understanding of the pathobiology of the sporadic forms of neurodegenerative diseases or of aging of the brain. ROS and RNS, i.e. oxidative stress, are not the origin of neuronal death. The cascade of events that leads to neurons, death is complex. In addition to mitochondrial dysfunction (apoptosis), excitotoxicity, oxidative stress (inflammation), the mechanisms from gene to disease involve also protein misfolding leading to aggregates and proteasome dysfunction on ubiquitinated material.

Oxidative modifications affect all cellular macromolecules. Lipids, proteins, nucleic acids and polysaccharides are all oxidized in AD. The following is a brief description of the chemistry of the oxidative reactions and of their cellular location in the brain in AD.

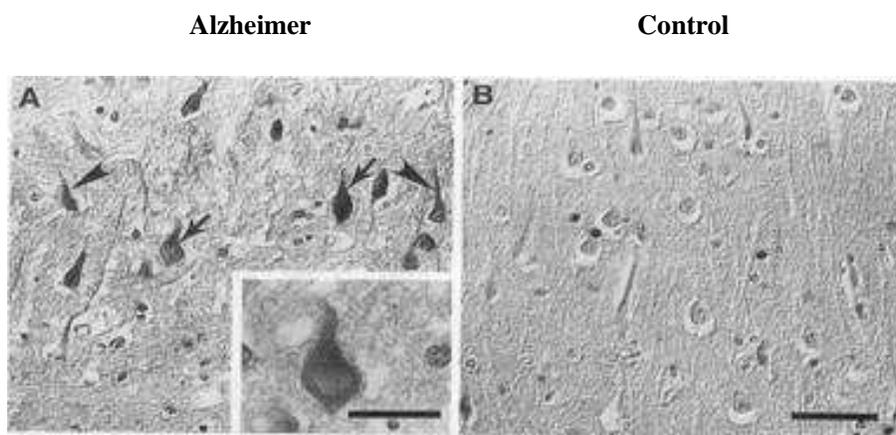
- Glycation – Reducing sugars react with protein side chains to form reversible and stable products [advanced glycation endproducts (AGE)] that require oxidation. Glycation products, particularly highly stable ones, are prominent in senile plaques, NFT, and neuronal cell bodies.

- Lipid peroxidation – Hydroxy radical attack of unsaturated lipids initiates lipid radical chain reactions leading to the non-stoichiometric generation of highly reactive secondary products, particularly reactive carbonyls. Reactive aldehydes are the most toxic product of oxidative damage as they can inactivate enzyme active sites. Also, oxidized membranes have altered mobility. Aldehyde adducts to protein are common on senile plaques and NFT and are most prominent in cell bodies of vulnerable neurons.

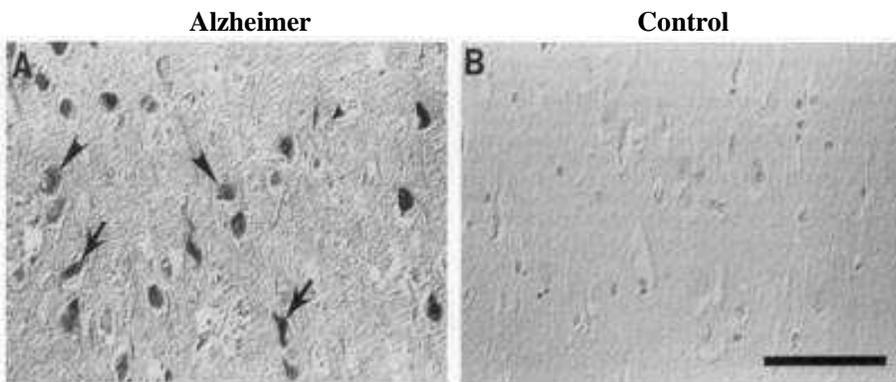
- Protein oxidation can directly oxidize protein amino acid side chains and cleave the peptide bond. Reactive carbonyls are often generated. Protein nitration is

a related phenomena and can be from peroxynitrite or peroxidative nitration. Protein oxidation is most prominent in neuronal cell bodies.

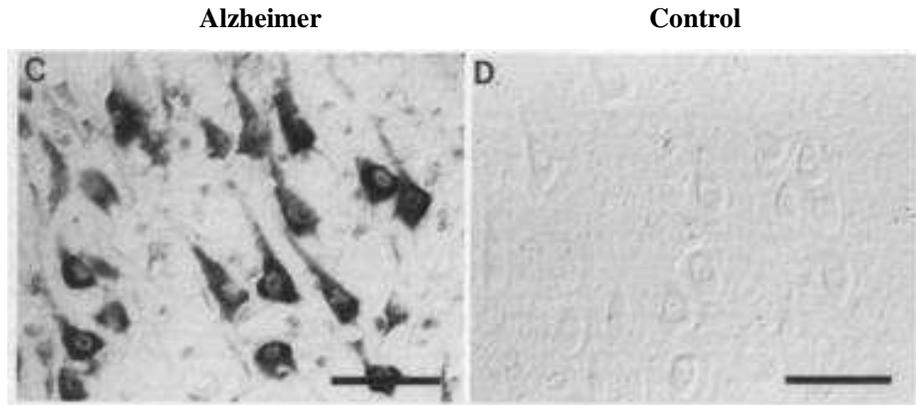
- Nucleic acid – Hydroxy radical attack of DNA and RNA leads to altered bases. DNA oxidation can be mutagenic while the effect on RNA is unknown. The most prominent oxidized nucleic acids are in vulnerable neuronal cell bodies.



**Figure 1.** Lipid Peroxidation/Protein Adduction(4-HNE)



**Figure 2.** Protein Oxidation (Free Carbonyl Groups)



**Figure 3.** Nucleic Acids (8-OH-Guanosine)

### The protective antioxidant diet

Many epidemiological studies have shown a link between diet and/or nutrition and the development of disease. To inhibit free radical generation, dietary antioxidants can minimize oxidative damage by:

1. Inhibiting initiation by blocking cellular free radical generators.
2. Repairing long-lived biological radicals before they are converted into stable products.
3. Inhibiting cellular expression of a mutagenic lesion.
4. Inducing apoptosis of damage cells.
6. Inducing and assisting enzymatic antioxidants and detoxifying agents.

<u>Nutrients per 1000 kcal</u>	<u>Alzheimer Disease</u>		<u>Cases</u>	<u>Controls</u>	<u>p Value</u>
<i>Vitamin A (RE)</i>	855	983			0.001
<i>a Carotene (mcg)</i>	294		389		0.001
<i>b Carotene (mcg)</i>	1921		2370		0.003
<i>Pro-A Carotene (mcg)</i>	2231		2809		0.001
<i>Lutein (mcg)</i>	972		1214		0.015
<i>Lycopene (mcg)</i>	666		927		0.001
<i>Vitamin C (mg)</i>	74.6		86.7		0.007
<i>Vitamin E (a TE)</i>	5.6		5.9		NS

### Servings per day

<i>Yellow/green vegetables</i>	<i>2.0</i>	<i>2.3</i>	<i>0.022</i>
<i>Vitamin C fruits, vegetables</i>	<i>2.4</i>	<i>2.6</i>	<i>NS</i>

**Conclusion**

These results support the hypothesis that an imbalance in antioxidant/oxidant status is associated with the progression of neurodegenerative disorders, and that dietary habits and/or oxidative stress play contributing roles.

There is scientific evidence that antioxidants and other micronutrients in the diet may play a major role in preventing or retarding oxidative stress in disease. Since endogenous antioxidant defenses are not 100 percent efficient, dietary antioxidants may be important in diminishing the cumulative effects of oxidative damage over the long human life-span. This influence may account for some of the beneficial effects of fruits, grains, and vegetables. Studies have also shown that animals on low caloric diets tend to have lower oxidative damage to DNA, proteins and lipids and they also have higher levels of protective catalase activity. In addition, some diseases, such as diabetes, have been associated with decreased levels of endogenous antioxidants; such observations could potentially increase the importance of nutrients as a source of antioxidants in affected individuals. Combined, these studies indicate that proper nutrition and caloric restriction may improve cells'

ability to remove reactive substances and damage to macromolecules, thereby protecting against many neurodegenerative diseases.

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## SOCIO-PSYCHOLOGICAL ASPECTS OF THE SPORTS PHENOMENON THE CASE OF LAWN-TENNIS

ALIN BACIU<sup>1</sup>

**REZUMAT. Aspecte sociopsihologice ale fenomenului sportiv. Cazul tenisului de câmp.** Lucrarea trateaza o serie de aspecte privind intersectia dintre sociologie si psihologie sociala, insistand asupra acelor care se pot aplica mai bine in cadrul tenisului, ca sport mai mult individual si fara contact direct intre competitori.

- a) Studii despre violenta in sport
- b) Publicul ca spectator direct
- c) Numarul telespectatorilor
- d) Psihologia grupului sportiv
- e) Factori sociali ai reusitei in sport
- f) Abordarea calitativa a explorarii tenisului

Specialized papers in the field of sports sociology approach a variety of aspects concerning the interrelationship between sociology and social psychology – in our country they are referred to both in relation to sociology (see Mișu, 1967, 2000) and social psychology (Neculau, 2003; Chelcea and Ilut, 2003). In this paper I shall mention some of them only briefly, focusing on those that apply most in the case of lawn-tennis, as a sport mostly individual and without direct contact between competitors.

a) Studies about **violence in sports** refer, on the one hand, to violence on the sports ground and, on the other hand, to the spectators' violence. In explaining aggression, it is resorted to the frustration and the direct provocation theory. Also, it is appealed to the distinction between the instrumental aggression (in “cold blood”, following a pragmatic, well-defined purpose) and the emotional-affective one (Mitrofan, 2003).

During the football matches, sometimes one can see how a good player is purposefully annihilated in order to be removed from the game (instrumental aggression); other times, a player simply can't control oneself having been hit and reacts (emotional aggression and reaction to direct provocation).

In the case of lawn-tennis a famous violence act was recorded when a German spectator got on the tennis court and back-stabbed the player Monica Seles, because he felt indignant that she was always winning against his fellow countrywoman, Steffi Graf.

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b) As for the **direct spectator**, specialized studies have attempted to decode the reasons why people find themselves on the sport grounds, in the gyms, on the skating rings, etc. A simple and valid explanation is that sport grounds, in the gyms, on the skating rings, etc. A simple and valid explanation is that sport represents a show in itself, has an entertaining function and gets the adrenalin going. There are some other reasons which matter a lot. Psycho-sociologists consider that indentifying oneself with a certain team or player is a fundamental one. It implies several sides – national, social, club identity, beloved personality in sport. The issue in question here is also a more subtle psychosocial phenomenon, that of basking in the reflected glory of others. It means that one can feel proud of oneself in one's own eyes or in the eyes of one's fellow-mates, attributing the qualities and successes of a prestigious person or institution (Baron and Byrne, 2000).

c) Nowadays the number of **TV viewers** watching sporting events has increased considerably. At the end of the XX<sup>th</sup> century, about 70% of the population aged 12-74 were interested in watching sporting events (Defrance, 2000). The percentage – claims the same author – greatly depends on the type of sport: rugby, cycling, football and motorized sports have a prevalently male public, tennis and skiing have a comparable impact on women and men, whereas gymnastics is watched especially by women. These data also apply to the French society, J. Defrance's conclusions being founded on the surveys of the French National Physical Education and Sports Institute (INSEP). The same source reveals that rugby and cycling are mostly enjoyed by the elderly people whereas football and motorized sports are enjoyed by young people. Farmers watch more cycling, workers watch football and motorized sports, while tennis and volleyball are more often watched by university graduate specialists and intermediate professionals.

As far as the relationship between media and sports is concerned, particularly between TV and tennis, B. Heimermann (1982) noticed even a few decades ago that the TV channels together with the equipment industry and their sponsors, put pressure on the organization on sport contests/competitions. They somehow tend to take the place of federations and other specialized forums, imposing, for example, the tie-break formula, new types of balls and rackets, for the sake of the show. With a view to the same idea of “interesting”, they organize demonstrative games, contests between the best tennis players in the world, between the former champion and the present one (e.g., in Las Vegas, in 1972, between Laver and Connors). After the 80s, the interrelationship between sport, media and business has somehow increased, but it seems that the problem is not so much of substitution, but of negotiation between the sports and the commercial forums and the top players, who also win a lot of money from the advertisements for different sports materials.

d) A major trend in sports sociology is the **psycho-sociology of the sports group**, with problems concerning the leader – team relationship, the leader both as game leader on the sport grounds and as a coach. In the case of tennis the psychosocial aspects refer to the coach – player relationship, as this sport does not assume team-play, except for the double. Therefore, the question of team cohesion is less important here than in other sports.

e) An extremely complex issue approached by sports sociology is that of the **social factors for success**. According to W. Thomas (2002), unlike the biological and psychological factors of sports success, the social ones have been studied less; he considers that the following are the most significant social factors:

*Filtering through class membership* on penetrating elite sport is realized by the fact that the access to the federal system is easier if you have a university degree. But both parents and children belonging to high classes have university degrees in sport to a larger extent. Complementary to that is the fact that the young people from disfavored classes and categories need to work earlier and, consequently, they neither can aspire to higher education, nor do they have the necessary time to devote themselves to high-performance sports. But things are different as far as the middle-class – high-class relationship is concerned. Having certain financial means, middle-class parents exploit all the resources so that their offspring can join elite sports, banking on a qualitative leap in life and social prestige. Several researchers (Thomas, 2002) have shown that sportsmen of middle-class origin are statistically better represented in performance sports, at least at the Olympic level. The working class is disadvantaged not only by the schooling effect, but also by the fact that performance in sports implies investments in equipment, training hours, traveling, training camps, etc. Due to this fact, classes and social strata differ from one another by the corresponding type of performance sport. In a research on the Olympic team of France in 1984 the same W. Thomas (2002) finds out the following: higher classes are more represented in horsemanship, tennis, fencing, synchronous swimming, skiing, while middle classes – in academic rowing, athletics, modern pentathlon, rhythmic gymnastics – and lower classes in biathlon, kayak and canoe, cycling and target shooting.

*The family environment*, due to the elder brothers and sisters – who can serve as role-models of success and also as practical support – and, mostly, due to the parents' attitude, plays a crucial role. The fundamental conclusion is that parents decisively determine the achievement in performance sports by means of several mechanisms: coming almost entirely from middle and higher classes, they have the necessary financial means to invest early for their children to practice sports. They inoculate values leading to performance, such as independence, the need to achieve success in life, determination, competition; alongside with financial support, parents also supply permanent psychological support, by encouraging, comforting, rallying. Most of the parents were sportsmen and women themselves, which means that they can offer professional support as well. I anticipate that the above-mentioned description is also correct for the children who play performance tennis in Cluj-Napoca.

*The social type differentiation* is also revealed in performance sports. Firstly, with a few exceptions, such as acrobatic and rhythmic gymnastics, the number of males in several sports branches is higher. Then, males have superior results in contests: the volleyball world male champion will always defeat the female champion. Not to mention football. In individual sports the difference is even more obvious.

Whenever Jimmy Connors met Martina Navratilova, he won, despite the fact that he started the game with a substantial handicap. The reason is obvious: performance is essentially based on force and physical abilities and men are naturally superior in this respect. It is also true that they get in the game to the detriment of women and sex role stereotypes. Women are appreciated for delicacy, fineness, beauty, eroticism. Early socialization and then the social environment challenges urge women to household and marital life, not to professional and sports performance; or, if it comes to success, then it is related to choreography, music, theater. However, this is rather a classical image; due to the feminist movement, things have radically changed in sports too. More and more young ladies get in the elite sports and their participation in the Olympic games has been increasing. Women's access into the sports world differ according to sports types. In France, the sports in which women participate in a higher percentage are in the following order: rhythmic gymnastics, tennis, badminton, basketball, swimming, table-tennis and volleyball (Thomas, 2002). It is worth emphasizing that the number of women practicing performance sports has been increasing. Things are different as far as the management positions, especially the training ones are concerned. In order that individual sportsmen or teams may have better and better results, men are preferred as coaches. For example, in USA, for the academic teams with national prestige, having 5 sports branches (track and field, basketball, softball, tennis and volleyball) the number of women decreased between 1978 and 1988 by about 20%. In tennis, in 1978 there were 72.9% women as compared to 52.2% in 1988. At least in tennis this trend is going on. The inequality to the detriment of women is also evident in the fact that, similarly with other domains, for the same qualification women coaches are paid less.

*Culture and country differentiation* The statistical figures of the international success of different nations, where the Olympic classification is relevant, show that the rich countries are dominant. The importance of the economic factor is clear. Almost all sports imply, at the level of national representation, enormous financial expenses and high technology. On the other hand, the probability of recruiting sports talents is higher in this case. But success in sports is determined by certain conditions and factors, whose importance differ according to the type of sport. The tradition of the national school in the field also matters. The Czech case in tennis is a good example in this respect. But socio-cultural factors also seem important. The individualistic competitive spirit of the Western culture, particularly of the Americans, influences success in tennis, track and field, whereas the collectivism more present in the Eastern (and former socialist) cultures seem to be responsible for the gym results obtained by Russia (former USSR) and China (Thomas, 2002).

f) A qualitative approach in **exploring tennis** belongs to A. M. Waser, former tennis player within several Strasbourg clubs, then university lecturer in Caen, working also at the Study and Management Center in Sports Innovation. Although her doctoral thesis in sociology is entitled "The Sociology of Tennis" (Paris, Harmattan, 1995), the paper reveals a close relationship between social aspects and mere social psychology aspects. Using the participants' observation and the intensive interview, the author compares 4 Strasbourg tennis clubs, focusing on

the social economic status of the club members, the interpersonal relationship between the members and the leaders of the clubs, the players demand and offer and the mutual determination between the club life and the general social life of the group members. Subtitled “A Crisis Genesis”, the paper focuses on the evolution of tennis in France, starting from the first clubs founded by the English aristocrats on the French territory between 1870 and 1880 up to 1990. The author shows how tennis has evolved from an entertaining activity to a federal sport. Up to 1960, although the French Tennis Federation had been founded, the clubs still looked like friends' meeting groups, playing for pleasure and socialization. As the federation and the clubs set standards for the game (the size of the tennis court, of the balls, and the game rules, etc.) organized tennis became more and more competition, hierarchy and industry. The prestige of the club depended now not so much on tradition and social quality of its members, but also on the players' value. So, recruiting them was no longer a question primarily of family and social professional membership, but a question of “how well s/he plays”. This means a serious financial problem as richer clubs could buy better players. A finishing stroke given to the traditional atmosphere of the tennis clubs, which thus lost social and cultural identity, came from TV stations broadcasting the competitions. A. M. Waser considers that the standardization of the tennis game by the federation and the broadcast of the matches on national and local channels were the major factors for the French tennis club crisis in the early nineties of the XX<sup>th</sup> century. The frustration of not being the best or good enough in front of thousands of people, as well as the “difficulty to find partners” and lack of time are the reasons invoked for the important decrease in the number of players admitted in tennis clubs. Even if tennis clubs have not entirely succumbed, their spirit is no longer what it used to be – a sports practice bearing plenty of symbolic valences – since they have changed themselves into barren competition spaces.

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ALIN BACIU

## STUDY INVOLVING ALTERNATIVE EDUCATIONAL SYSTEMS IN TEACHING PHYSICAL EDUCATION IN THE 3<sup>RD</sup> AND 4<sup>TH</sup> GRADES

BERTOK SZABOLCS LEVENTE<sup>1</sup>

**REZUMAT. Studiu privind sisteme educaționale alternative în predarea educației fizice la clasele a 3.-a și a 4.-a . Formularea problemei studiului:** În cadrul învățământului primar distingem deci două structuri educaționale de predare al acestei discipline, adică pregătirea elevilor preșcolari de către învățătoare, respectiv de către profesorii specializați în educație fizică și sport.

**Ipoteza de lucru:** Dacă în cadrul unei ore am supune toți elevii claselor a 3 –a și a 4 –a al celor trei școli din Cluj-Napoca, respectiv din Budapesta la aceleași succesiuni de exerciții al unui traseu utilitar-aplicativ, atunci există probabilitatea ca media clasei instruite de învățătoare, obținută prin acumularea timpurilor realizate de elevi la acest traseu, să difere de cele realizate de clasele care sunt pregătite de un profesor de educație fizică.

Dintre tipurile de cercetare științifică am ales două metode, și anume: metoda anchetei prin utilizarea chestionarelor deschise, care permit subiecților posibilitatea de a răspunde liber la întrebări, respectiv metoda normelor și măsurătorilor. Chestionarele au fost completate de 31 de profesori și învățătoare din cadrul celor șase instituții de învățământ.

Din fiecare instituție de învățământ am ales câte o clasă de a 3-a și câte una de a 4-a. Toți elevii acestor clase au participat la acest traseu utilitar-aplicativ care arată astfel:

- lungimea ei este de 15 m;
- poziția de plecare de la linia de fund al terenului: semi-genoflexiuni, cu picioarele apropiate, mâinile drepte întinse la nivelul pieptului;
  1. rostogolire înainte pe saltea;
  2. mersul racului peste banca de gimnastică;
  3. scoaterea mingii din lada întoarsă și conducerea ei cu mâna;
  4. săritura „iepurelui” până la linia de fund.

Norma pe care am aplicat-o constă deci dintr-o succesiune de exerciții cu elemente de gimnastică, mișcări motrice imitative și elemente de joc sportiv.

Pe parcursul acestui studiu am evaluat 12 clase cu un total de 250 de elevi. Desigur performanțele copiilor au fost măsurate contratimp, iar rezultatele au fost notate în tabele, trecând și valorile zecimale.

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## **PRESENTATION NOTE**

My intention through the present study is to present the results of several investigations with regard to the previous achievements and the motional dispositions of the students of 3rd and 4th grade.

This study refers to the eventual differences concerning the motional practice of the 3rd and 4th grade students, coming from schools where physical training is given by the schoolmaster or schoolmistress of the class, as well as the motional practice of those coming from schools where classes are given by a professor specialized in this field of educational activity.

### ***Debate on the Issue of Research***

The teachers' educational activity in different educational institutions is of major importance considering the psychic and a harmonious physical development of the students as well as their personal development. We can state the same in the case of teachers specialized in physical education. The professional knowledge of the educational staff has a great deal of influence on the students' level of capacity and physical ability; it develops their physical and motional culture (motional qualities and skills).

Teaching physical education does not depend exclusively on the teachers' level of knowledge and professional skills, but it can be equally realized by a specialized professor. For instance, in Hungary teachers who have previously finished a college or faculty of physical education have the possibility to teach physical education in elementary schools too, of course, only with the approval or the request of the board of educational institution.

### ***Objective of the Research***

In the 1st semester of the 2004/5 school year I earned a study scholarship abroad, namely to the "Faculty of Physical Education and Sports" at Semmelweis University in Budapest. Between September 15 and December 15, 2004 I had the opportunity to familiarize with educational systems of some schools concerning teaching physical education. Between February 1 and April 30, 2005 I profited by the knowledge and experience accumulated in Hungary and I continued my study in our town.

The main objective of this study was to present a possible difference with regard to the qualities and coordinative abilities of elementary school students in educational institutions in Budapest and Cluj-Napoca.

The six schools I managed to contact were randomly chosen and they are situated in the district of Mănăştur and in the IX. and XIV. district zones in Budapest: on the one hand, Primary School nr. 20, Primary School nr. 21 and Ion Creangă Primary School, on the other hand, Városligeti, Németh Imre and Liszt Ferenc primary schools.

### RESEARCH HYPOTESIS

If, in the course of a physical education class, we subjected all the 3rd and 4th grade students of the six schools to the same series of exercise on a utilitarian-applicable track, then there is the probability that the average of a class instructed by a regular teacher – obtained by adding up the realized time of the students throughout the track - differs from those classes instructed by a teacher specialized in physical education.

### METHODS FOR REALIYING THE RESEARCH

I chose two methods from the types of scientific research, namely: the method of applying questionnaires, norms and measuring.

#### *Educational Staff Involved in the Research and in the Applying of the Questionnaires*

The questionnaires were filled in by 31 professors and school mistresses, who were in charge of teaching the 3rd and 4th grade students of these schools.

The name of Institution	The number of school mistresses in the 3 <sup>rd</sup> grade	The number of school mistresses in the 4th grade	The number of professors	Total
Nr. 20 P.S.	2	2	1	5
Nr. 21 P.S.	3	3	-	6
Ion Creangă P.S.	3	3	-	6
Városligeti P.S.	-	-	1	1
Németh Imre P.S.	3	3	1	7
Liszt Ferenc P.S.	3	3	-	6
				31

**Chart nr. 1.** The educational staff who involved in the research.

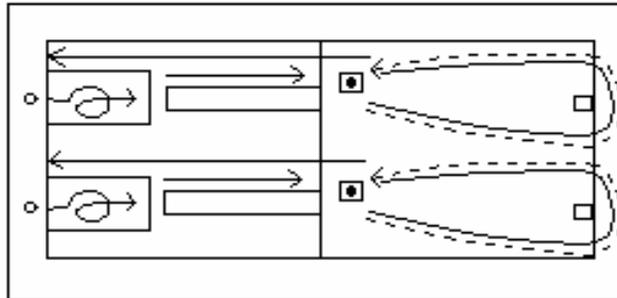
#### *Number of Students Who Participated in the Investigation*

I chose a 3rd and a 4th grade class from each educational institution. This means 12 classes having a total number of 250 students who took part in my research. The norm I applied consists of a series of exercises with gymnastic elements, imitative motional movements and elements of sports games.

Description of the route:

- the length of the route is 15 m;
- starting position from the baseline of the ground: semi-knee bend, with legs close to one another, right hands stretched forwards;

- rolling forwards on the mattress;
- going backwards on the gymnastic board;
- taking out the ball from the reversed box and its controlling with the hand, turning back;
- “rabbit’s” jump to the baseline.



**Drawing nr 1.** The structure and drawing of the route.

## ACHIEVED RESULTS

After I have presented all the data referring to the present study, let us see whether the facts can justify the assumptions made in the research hypothesis.

### *Evaluating the Questionnaires*

The questionnaires were distributed among the 31 teachers, including 10 questions referring to the educational systems of the schools the study was to involve.

The first two questions are meant to find out the name of the educational institution as well as certain data referring to the function and the level of skill of the educational staff in order to establish a most efficient collaboration with them.

The third question aims the number of students, separating the number of boys from that of the girls within the class at issue.

*“How many physical education classes have you got in a week?”*

Analyzing this fourth question we conclude the following particularities:

➤ In Primary School nr. 20 (Cluj-Napoca) the students of the two classes with sport specialization, namely III. A and IV. B, are prepared three classes per week by a teacher specialized in judo. These students have also got two classes of physical education with their regular teacher.

➤ Primary School nr. 21 (Cluj-Napoca): the students from the classes III.B, IV.B, IV.C. two swimming classes per week in the “Olympic Pool”, and the rest of the three classes have got two classes taken by the regular teachers of the classes in question.

STUDY INVOLVING ALTERNATIVE EDUCATIONAL SYSTEMS IN TEACHING PHYSICAL EDUCATION

- Ion Creangă Primary School (Cluj-Napoca): the same case – two hours per week.
- In Városligeti Primary School (Budapest) the physical education classes are taken by a teacher who is qualified in English and Sports. She has two classes per week in three classes of 3rd grade and three classes in two classes of 4th grade.
- Németh Imre Primary School (Budapest): in this institution a teacher specialized in sports games (basketball) is in charge of the physical education classes. He has one class in each of the six primary classes (three in the 3rd grade and three in the 4th grade). The two other classes are taken by the regular teachers.
- In Liszt Ferenc Primary school (Budapest): the teachers take three classes of physical education each week.

With the help of the question to follow: *“I would like you to tell me how long the students are active during a physical education class (in minutes)”* my intention was to find out about the time the students are actually active throughout a single class. The answers led me to the conclusion that the students are on the move for about 35-40 minutes out of 50.

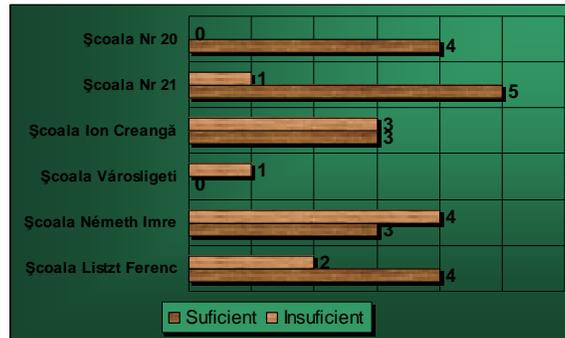
The sixth question: *“What are the forms of organizing physical education and sports activities apart from the prescribed curriculum – forms with extra educational characteristics (if there are any)?”* I received the following data:

The name of Institution	Forms of organizing physical education and sports	The time allocated
Nr. 20 P.S.	Judo	3x1
Nr. 21 P.S.	Journey’s, funny physical exercises	Sometimes
Ion Creangă P.S.	Swimming, tennis, gymnastics, volley, basketball, football	2x1
Városligeti P.S.	Basketball	1x2
Németh Imre P.S.	Basketball, football, volley, tennis	2x1
Liszt Ferenc P.S.	Swimming (spring and autumn), skating (winter)	1x1 + 1x1 / 7 + 7 week

**Chart nr. 2.** Forms with extra educational characteristics in primary education specific for the six educational institutions.

Question number 7: *“In your opinion, is it enough for the students in the 3rd and 4th grade the number of classes per week marked out for implementing certain motional activities (physical exercises)?”*

Let us have a look at the following diagram for a better understanding:



**Diagram nr. 1.** The opinions of the educational staff.

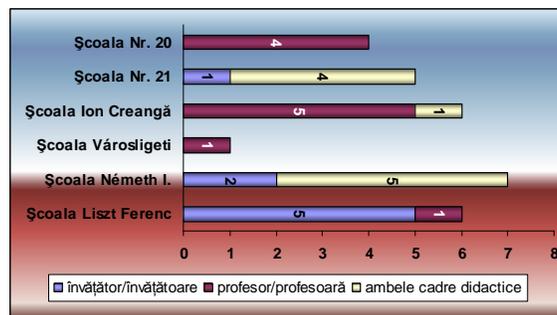
The eighth question: “*What are the main educational objectives which are to be realized through physical education?*” The following answers were the most frequent among the respondents:

- a general harmonious physical development;
- development of the basic motional qualities;
- maintaining a state of health;
- forming positive personality traits.

The next question concerns the opinion of each teacher about the forms of education within the scope of primary education: “Which of the following forms of education appears more efficient to you for the students of primary classes:

- a. if physical education classes are taken by a teacher specialized in the respective field;
- b. if physical education classes are taken by the regular teacher of the class;
- c. if physical education classes are taken by both types of teachers simultaneously

Out of the answers 32,25% of the teachers were for the support of a specialized teacher during the class and 35,48% would give priority for them.



**Diagram nr. 2.** Educational forms favoured by the 31 teachers.

The last three questions refer exactly to the exercises the students need to do during the classes as well as to the teachers' opinion about the level of motional skills their students have reached so far. The answers given were affirmative.

### ***Results of the Normative Method of Evaluation***

The normative method was applied to a single 3rd grade and one of 4th grade class from each of the abovementioned educational institutions. This procedure consists of a utilitarian-applicable track described in chapter 3.2.

The component exercises of this track are part of the curriculum in accord with the qualities and capacities particular to this age.

The 250 students of the 12 classes were evaluated during their classes under my guidance. The track had to be accomplished in time, the hundredth seconds being counted as well.

What concerns the students' best results, I could point out from the very beginning a certain difference in the level of performance and the method of execution -with regard to the whole series of exercises – between the students educated by a regular teacher, those educated by a specialized teacher as well as the students educated by both. Accordingly, the best of the students from Városligeti, Molnár Ferenc and Németh Imre primary schools could finish the track in 16-18 minutes, whereas the students of Liszt Ferenc primary school, educated by their regular teacher could finish the track in more than 20 seconds:

	The highest results		The lowest results	
	3 <sup>rd</sup>	4 <sup>th</sup>	3 <sup>rd</sup>	4 <sup>th</sup>
Nr. 20 P.S.	17.59	16.21	28.70	24.60
Nr. 21 P.S.	18.98	18.23	45.66	42.25
Ion Creangă P.S.	22.30	18.60	50.84	32.16
Városligeti P.S.	17.32	16.06	41.33	30.22
Németh Imre P.S.	17.47	17.92	31.24	36.12
Liszt Ferenc P.S.	20.78	20.87	40.73	38.54

**Chart nr. 3.** The highest and the lowest results achieved by the students of the 12 primary classes.

With the help of the statistic calculations I managed to figure out the average of each class, an average got from all of the results achieved by the students and divided by the number of students.

The results were the following:

	<b>The average result</b>	
	<b>3<sup>rd</sup></b>	<b>4<sup>th</sup></b>
<b>Nr. 20 P.S.</b>	<b>22.93</b>	<b>19.89</b>
<b>Nr. 21 P.S.</b>	<b>27.84</b>	<b>26.47</b>
<b>Ion Creangă P.S.</b>	<b>27.82</b>	<b>23.22</b>
<b>Városligeti P.S.</b>	<b>24.63</b>	<b>22.34</b>
<b>Németh Imre P.S.</b>	<b>24.53</b>	<b>23.61</b>
<b>Liszt Ferenc P.S.</b>	<b>30.82</b>	<b>27.70</b>

**Chart nr. 4.** The average result of the classes achieved in the utilitarian-applicable track.

My observations disclose the difference between the approximately equal results of the three schools where physical education is taken with the help of a specialized teacher (primary schools nr. 20, Városligeti and Németh Imre) and those schools where only the regular teacher is in charge of the classes (primary schools nr. 21, Ion Creangă and Liszt Ferenc). These data results lead to the conclusion that the suggested assumptions in the hypothesis of the study are verified: indeed, there is a certain difference in the level of performance and results between the two educational systems of primary classes.

### CONCLUSIONS

Personality, skills and educational tact as well as the level of professional preparedness both of regular and specialized teachers, who take physical education classes in primary classes, have to manifest themselves in the achieved results of the students and in their interest in physical activity. So, the question is this:

- ❖ What is the reason for the existence of the differences in level between the two educational systems?
- ❖ In which part of the utilitarian-applicable track were the students taught by their regular teachers less skillful and why?
- ❖ What did those difficulties appear for in accomplishing certain exercises of the track?

One of the following suppositions gives us the answer for the differences between the results of the classes under investigation:

- ✚ Probably due to the preparedness of the teachers specialized in physical education, the students were more ready for this field of activity.
- ✚ The teachers could possibly manage to deepen the exercises particular to certain sports branches at the level of the primary cycle.

- ✚ Teachers take these classes rather on educational grounds and grading is more than positive.
- ✚ It is probable that teachers consider the following fields of knowledge much more important than physical education: Math, reading, knowing the environment etc.

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BERTOK SZABOLCS LEVENTE

## THE SPORT GAME AT CHILDREN WITH VISUAL IMPAIRMENTS

PRODEA COSMIN<sup>1</sup>, POP IOAN NELU<sup>2</sup>

**REZUMAT. Jocurile sportive la deficienții vizuali.** Odată, Strabinsky a fost întrebat dacă și este greu să compună muzică. Răspunsul a fost: "Ori e ușor, ori imposibil!". Dacă profesorul de educație fizică este întrebat: "Este ușor să <obții> inima copiilor pentru educație fizică?" Răspunsul ar putea fi: "nu este ușor întotdeauna, dar deloc imposibil". Cunoscând marile sarcini care stau în fața activităților de educație fizică și sport, a căror valoare socială este legată direct de contribuția pe care o are în vederea îmbunătățirii sănătății și creșterii capacității de efort și cunoscând realitățile prezente, putem elabora noi metode și mijloace de acționare în vederea obținerii eficienței dorite.

În concepția învățământului modern profesorul apare într-o nouă viziune: să caute noi modalități de apropiere afectivă pentru a crește factorul motivațional care și dirijează pe elevi în procesul învățării.

Jocul sportiv asigură un cadru plăcut, antrenant, motivează pozitiv asimilarea noilor cunoștințe și contribuie efectiv la formarea priceperilor și deprinderilor motrice, precum și la dezvoltarea calităților motrice, într-un cuvânt la dezvoltarea motricității generale.

În cazul copiilor nevăzători, educația prin joc urmărește să compenseze acele achiziții rămase în urmă. Cea ce este foarte important este că jocul le dezvoltă coordonarea, orientarea în spațiu, viteza, rezistența, capacitatea de generalizare, de aplicare a cunoștințelor, priceperilor și deprinderilor, precum și sociabilitatea, spiritul de colectiv, încrederea în forțele proprii.

Jocurile sportive pentru copii nevăzători sunt de mare însemnătate, dată fiind tendința spre sedentarism și rigiditate a multor copii nevăzători și posibilitățile prin aceste jocuri de a deprinde cu mobilitatea normală a copiilor văzători.

Prin jocuri sportive, fără să-i obosescă prea mult, pun în acțiune mișcări naturale simple, obișnuite ca: sărituri, prinderi etc., care intensifică sistemul muscular, aparatul circulator și respirator, constituind totodată un bun mijloc de tranziție a elevilor de la activitatea intelectuală la activitatea fizică, producând în același timp plăcere, voieșie, înviorare, odihnă.

Prin stările emoționale pe care le creează, ca și prin deprinderile motrice pe care le dezvoltă, prin influențele care le exercită asupra caracterului elevilor nevăzători (stăpânire de sine, hotărârea, perseverența), aceste jocuri sportive îi pregătesc pentru o viață cât mai normală, dezvoltă conduita elevilor în colectiv, disciplina, inițiativa și implicit atitudinea lor socială.

Jocurile sportive servesc totodată la o mai bună cunoaștere a elevilor, întăresc voința, dezvoltă sentimentele și inteligența. Adaptate la particularitățile elevilor nevăzători jocurile sportive reprezintă mijloace deosebit de eficiente pentru dezvoltarea multilaterală a acestor copii și promovarea dorinței lor de adaptare.

Lucrarea în extenso cuprinde: importanța jocului sportiv la nevăzători, performanța sportivă la persoanele cu handicap vizual, cunoașterea particularităților individuale ale elevilor nevăzători - *condiție pentru practicarea jocurilor sportive, condițiile specifice de învățare a jocurilor sportive la nevăzători, jocuri sportive practicate în școlile cu deficiențe de vedere, testări și interpretarea testărilor.*

### **Importance of sportive games in visual disabled peoples**

Blind children's education through games tend to compensate those acquisitions left behind. What is very important to the blind peoples is forming the spatial<sup>1</sup> orientation capacity, knowing the corporal attitude, laterality, developing the fine general movement.

Sportive games for blind children have a big importance, knowing the tendency towards sedentary life, rigidity, the chance for them to have a normal mobility.

Through games without getting tired they make simple, usual movements like: jumps, catches etc., which enhances the muscular system, circulatory system, respiratory system being a good transition mean from intellectual activity to physical activity, producing pleasure, joy, leisure.

By creating emotional moods like motoric skills that they develop, the influences upon blind people's character (perseverance, decision, and self mastery); these games prepare them for a simple and normal life, they learn to behave in community, discipline, initiative and social attitude.

Sportive games serve to a better knowledge of peoples, strengths the will, develops feelings and intelligence. The games are adapted to their needs and are an efficient mean to their development and promote the will to adapt.

### **Sportive performance in visual disabled peoples**

Performance is a vast notion, relatively abstract, neutral value that names all the actions and the results of those actions, which contributes in a certain way to the person's survival or collectivity. The performance is the result of an activity that activity rises above the normal level, being superior. (P.Popescu-Nevianu).

Generalizing this aspect we can talk about performance only when succeeding is in an adequate report with human capacity.

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Sportive performance in visual disabled peoples is not identical as the ones that see. We have to mention the fact that performance in peoples with special needs has a lower level, but sufficiently raised compared to the medium results.

In case of peoples with special needs through performance we follow:

- maximizing the existent biometrical potential,
- creating a group imagines or self imagine - a superior capitalization of the existing competences.

**To know the individual peculiarities of visual disabled peoples –main condition to practice sportive games.**

Having in mind the blind people's peculiarities, especially physical and psychic, exercising sportive games in physical education classes must play a prior role in their activity, to stimulate and increase the faith in succeeding. The need of movement and recreation is one of the main issues for the experts that teach physical education in special schools.

Sportive games for blind people must be adapted to their peculiarities in such a way that they can overtake their visual motric handicap.

Main condition in practicing sportive games in blind peoples is to know each child by approaching several factors:

- knowing the physical development, health status, personal or hereditary records;
- knowing the psychological structure by identifying the ruling personality and the existing equilibrium;
- knowing the aspect that involves learning motric abilities, basic ones and specific to sportive games;
- Knowing the family in which he was born, raised, the existing conditions for development, parental attitude towards school activity.

**Special needs for learning sportive games in visual disabled peoples**

**Safety**

In order to mobilize all the resources for exercising the peoples must feel safe. Without safety given by the visual information and the immediate reactions and anticipation, the blind people risk to be passive and dependent.

**Material conditions**

Inside or outdoor there must be safety measures, the playground must be equipped.

The action space must be:

- Well limited; walls can correspond to field limits.
- Free; doors must be closed, cover the dangerous surfaces (bars, unequal bars) on head level or ground level.
- The ball; volleyball lighter than the normal one, less dangerous in throwing.

### **Adapting the game**

#### **How to play: rules.**

Some gestures are prohibited: direct pass is replaced. Before throwing the player ask the partners: “ready?”

#### **Effective**

Number of players depends on the size of the room. Density is not too large to reduce the injury risks.

#### **Teacher’s role**

Continuous watchfulness combined with a good knowledge of the children allows them to prevent any dangerous situation and to intervene fast. Calm attitude, accuracy and clarity in space are efficient warranties and mutual trust.

#### **Active safety**

Unlike “passive safety” which provides an active background: arranged, without risks, “active safety” supposes real and conscious commitment.

### ***A specific technique: protection technique***

During walking, the player protects himself having an arm bended in circle outside the body, at chest level. This technique allows the player to feel the contact with a material obstacle or other player by hand or forearm. In this last case direct shock is taken by both players.

### **Retrieving in space**

Controlling the action space, realizing the movement and the ball are necessary for the players.

#### **Touching**

Touching informs with a great precision but sometimes in certain limits about the training limits. Contact sensibility realized trough hand, supposes an active exploration which allows an enhancement of the play field and a better qualitative perception of the space. Tactile information combined with kinesthetic for a more efficient exploration. Knowing the direct influence that touching has upon surroundings leave a small possibility for anticipation.

#### **Tactile – kinesthetic manual information**

Hands are signs and in the same time most reach tactile receivers and mobile in all space planes, by the superior limb articulations. Hands help the blind peoples compensating the lack of sight.

If manual touching informs better then sight upon substances and objects properties we can’t say the same thing about orientation in space. To explore the immediate space we can use both hands simultaneous and alternatively, each hand can work independently. Usually the dominant hand takes action and the other one follows. The percept field can be incomplete if the explored arias aren’t put together or covered completely. The blind must memorize and organize different information that is gathered in a sequential way.

Exercising handball and basketball tactile – kinesthetic manual information are important when discovering:

- Places: the child explores touching the walls. He notes the texture, angles, and irregularities, analyses them, integrates them, synthesizes them and memorizes them. He must be capable when the time comes, in different and unpredictable opportunities to explore them.
- Apparatus and materials characteristic to each sport: the child must perceive through bimanual, methodic and active exploration the objects, carpets, panels etc., and to understand their orientation.

#### **Tactile – kinesthetic plantar information**

Tactile receptors in foot have an important role in equilibrium giving useful information for space location. This information is the same as those gathered by the hands less rich qualitative (lower density in receptors) and quantitative (reduce mobility in lower limbs).

Outside or in a bigger hall, action field can be limited with different textures easily perceptible by foot. In a known place even the smallest irregularities are explored by blind people, this contributes to their spatial location.

#### **Hearing**

Having the lack of sight, hearing is essential in perceiving the information, the distances and transform them in spatial terms. Hearing plays an important role in maintaining the watchfulness. With his help they perceive the changes and possible danger.

Perceiving and processing the hearing information ask a big focusing. A hearing deficiency mono or bilateral, even easy one alters the space clues from the distance and compromises space location.

#### **Direct sonorous sources**

Locating the sounds is considered to be primordial in unleashing one action and in movements.

Capturing information involves positioning of the head in relation with sonorous source. In collective games the sound gives indications quite accurate for locating. The players can locate, but also identify others players by their voice.

#### **Indirect sonorous sources**

##### **Sense of mass and obstacles**

Processing sonorous manifestation by the blind people allows them to detect masses and obstacles without using the touch. This capacity is not exactly the sixth sense that the blind people have, but is a hearing phenomenon. The blind – deaf people don't have it. The sense of mass and obstacles or echolocation corresponds to the detection capacity and processing information given by echoes. This is the procedure that bats use or dolphins but in different ultra sonorous waves that give an accurate precision.

Between sonorous signals in the two ears exists phase intervals that allows perceiving the direction. The variation of intensity and timbre informs about the distance and texture of the obstacle. This detection capacity of sounds by reflex is labile, dependent on medium factors and subject's himself factors (tiredness, emotional moods).

Teacher's experience who worked for a long time with blind people leads to the saying that this aptitude can be developed. The congenital blinds who exercised this capacity after birth show a great superiority.

In exercising handball or basketball the indirect sonorous sources play an important role in perceiving the surroundings.

### **Sportive games components that must be learned by the visual disabled peoples**

#### **1. Locating the ball** – orientation towards a jumping ball.

Organizing: the teacher or the player dribbles by turning around the player who stands still. Body orientation must be modified as the player to face the partner who dribbles.

#### **2. Locating the player**

Organizing: one child stands with his back on the middle of the wall. His partner is in the center of the room. He moves towards his partner with his arm stretched for protection. He gets as close as he can, avoids him and points to opposite wall always in direct line.

#### **The movement is made avoiding the immobile players**

Organizing: one player stands facing the partners organized in column of around 4m. Passes trough them, leaves the first player on his right, moving around and touching with his right hand.

#### **3. Using the ball**

##### **Launching – catching the ball without partner**

##### **Launching – catching the rolling ball on the floor**

Organizing: one player having one ball and standing on a bench facing another bench turned around leaned on the wall. The distances between benches are 2-3m. The player launches the ball with one or both hands. The ball rolls till the other bench, touches it and comes back. The players catch again the ball. We can uses ball with different sizes and weights. The child learns to launch and receive the ball using sonorous signs, the noise made by the ball on the floor.

##### **4. Launching – catching the ball thrown on vertical**

Organizing: one player stands on a bench. A ball is thrown in vertical and then is cached. The player throws the ball with one hand or two and catches it with two hands, and then the ball is thrown higher. After that the player throws the ball

from one hand to another then higher. The exercise offers a difficult range because it lacks the sonorous clue which allows following the direction of the ball.

**5. Catching the ball from an player**

Organizing: one player sits in his knees and soles tied to a reversed bench. One partner or the teacher situated at 3-4 m rolls up a sonorous ball. The player catches the ball.

**6. Launching the ball towards one partner without changing the orientation of the body**

Organizing: one player has the ball and in front of his partner who has one knee leaned to the bench. A ball is thrown rolling on the floor.

**7. Launching – catching the ball by changing the orientation of the body**

Organizing: four players are situated in the corners of a square. One of them has the ball. The one who has the ball announces: "I have the ball" and launches the ball to a pre established direction, for example to the right. The partner to who is addressed the ball catches it turns around to the right 90 degrees, makes the announcement and launches the ball to the partner in the right.

The formation can be changed, exercised in circle, rectangle, etc., the distances between players can change, and the ball is launched always in the same sense or to the right either to the left.

**TORBALL**

Torball-ul is a game invented by the Germans for the blind peoples. Two teams of 3 players are faced. The players who can still see some parts are blinded with some bands on their eyes. The game takes place in a rectangular room divided by a medial line that ties the two lengths. Behind each field we can find the targets. The ball is sonorous. Each team tries to send the ball behind each back line while the other team tries to avoid it.

The two teams remain in their camps, each player having a precise space established by a carpet. The ball is rolled on the floor so there is no crashing between players or the ball.

The targets can be materialized by benches. We can use 1 kg balls or 2 depending on age, and player's possibilities. The sonorous ball offers:

- a easy detection,
- medium speed, so the slow players can place themselves properly,
- Intense physical effort.

We can use volleyballs: the ball is not sonorous, so difficult to locate, light, moves faster; watchfulness is needed to anticipate the trajectory and is less dangerous.

Generally torball-ul is a useful game. It allows:

- To estimate the distances;
- To locate the targets;
- To learn what a game means.

### Tests taken to evaluate motric skills in torball

For a better knowledge of the motric skills specific to sportive games adapted to blind peoples we realized an evaluation trough a specific test: torball – attach hit.

The working batch is formed by 38 peoples from fifth and sixth grade from Cluj Napoca, The school for sight deficiencies, 12 with **blindness** and 26 with **amblyopia**.

#### 1. Attach hit – specific in Torball

Describing the test:

- The test takes place in school's sports hall;
- The material used are: sonorous ball, 2 gymnastic benches;
- a line is drawn 3 m from the wall on the side parallel with the wall;
- 15 m from this line parallels with the line 2 benches one on top of the other;
- the 2 benches represents the gate or the target;
- at each end of the bench one colleague of the shooter is situated and signalizes sonorous the size of the gate;
- the player is behind the line facing the gate with the sonorous ball in his hand;
- the ball is rolled on the floor to touch the gate;
- The test is taken 10 times with the right hand.

At this test in torball game (attach hit) there were established the following standards:

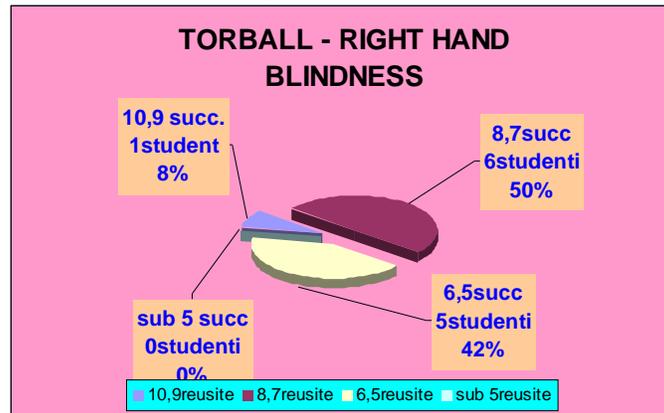
- 9, 10 succeeds - very good (V.G.);
- 7, 8 succeeds - good (G);
- 6, 5 succeeds - sufficient (S);
- under 5 succeeds - insufficient (I)

#### A. Taking the test – **Right hand** -

In peoples with blindness from 12 subjects we have:

- 1 pupil meaning 8 % - 9, 10 succeeds;
- 6 pupils meaning 50 % - 7, 8 succeeds;
- 5 pupils meaning 42 % - 6, 5 succeeds;
- 0 pupil meaning 0 % - fewer than 5 succeeds.

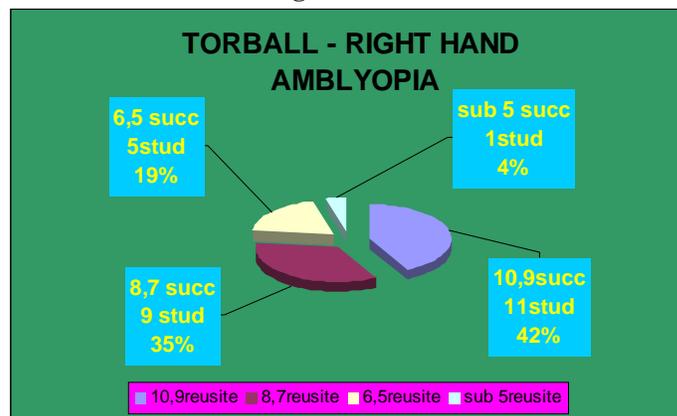
Diagram torball nr.1.



In peoples with *ambyopia* from 26 subjects we have:

- 11 pupils meaning 42 % - 9, 10 succeeds;
- 9 pupils meaning 35 % - 7, 8 succeeds;
- 5 pupils meaning 19 % - 6, 5 succeeds;
- 1 pupil meaning 4 % - fewer than 5 succeeds.

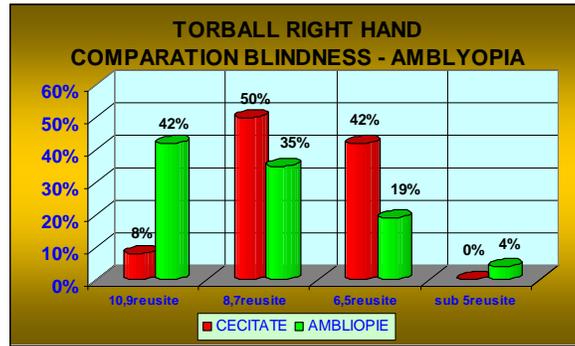
Diagram torball nr.2



The difference between pupils with amblyopia and blindness which had very good results, 9 or 10 succeeds (11 pupils with amblyopia towards blindness) is determined in a certain level by the level of deficiency.

Were compared the pupils with amblyopia and the ones with blindness for the right hand and as the result we have the following diagram:

**Diagram torball nr.3**



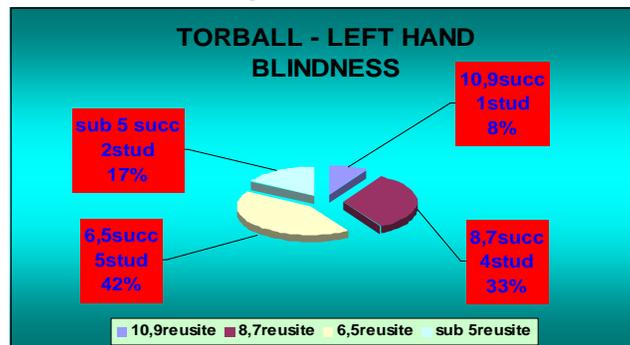
The number of pupils who realized a minimum of 7 succeeds is better in pupils with amblyopia, 77% had this score, but we cannot neglect the fact that still 60% from the pupils with blindness, precisely 58% had a minimum of 7 succeeds, aspect which tell us the attach hit is well known by the pupils and well executed for a number of 27 pupil from 38.

**A. Taking the test – Left hand -**

In peoples with blindness from 12 subjects we have:

- 1 pupil meaning 8 % - 9, 10 succeeds;
- 4 pupils meaning 33 % - 7, 8 succeeds;
- 5 pupils meaning 42 % - 6, 5 succeeds;
- 2 pupils meaning 17 % - fewer than 5 succeed.

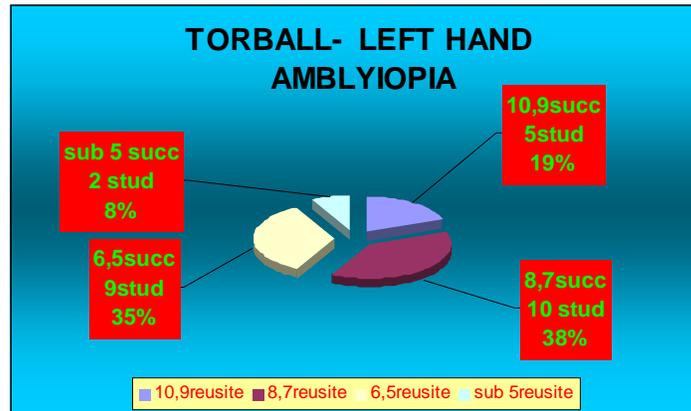
**Diagram torball nr.4.**



In peoples with *amblyopia* from 26 subjects we have:

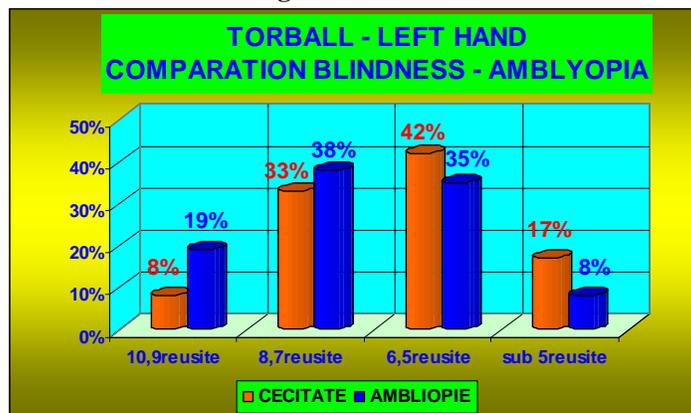
- 5 pupils meaning 19 % - 9, 10 succeeds;
- 10 pupils meaning 38 % - 7, 8 succeeds;
- 9 pupils meaning 35 % - 6, 5 succeeds;
- 2 pupils meaning 8 % - fewer than 5 succeed.

Diagram torball nr.5



We compared the pupils with amblyopia and the ones with blindness for the left hand and as the result we have the following diagram:

Diagram torball nr.6

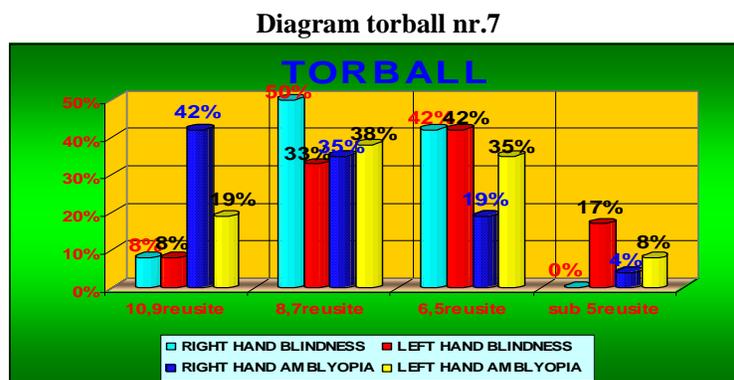


In pupils with blindness, the number of pupils who managed minimum 7 succeeds with right hand towards the ones with left hands, which shows that there isn't a significant dominance of the right hand over the left hand. In pupils with amblyopia there is a big difference : right hand - 20 pupils succeeded minimum 7 shots, left hand only 15 pupils succeeded minimum 7 shots.

We can see that the number of pupils who realized maximum 6 succeeds with the left hand is bigger (18 pupils) then the ones with right hand, only 11 pupils, so the left hand execution is of a mediocre level.

If we analyze the right hand diagram we notice that between 5 and 8 succeeds was a significant percentage, meaning 75% from the ones with blindness and 73% from the ones with amblyopia. So these pupils have a medium - good level in the way they realized this test.

The general diagram – compares succeeds in attach hit, so:



We know that the pupils in fifth grade have some knowledge about the Torball game because is the first game they are thought in physical education classes. The pupils love it and the results were good in pupils with blindness and amblyopia.

Another aspect to take in consideration is the concentrations in every one of the 10 attach hits. Even if this aspect was different from one pupil to another, some were wrong by not being attentive or to sure that they can manage in every situation. When the pupils misted the target they were quite close to the gate. Concerning the throwing technique the pupils use in attach hit a satisfier technique.

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## MEANS OF DEVELOPING THE RESISTANCE SPECIFIC TO VOLLEYBALL, BY USING THE METHOD WITH INTERVALS, ON A SENIOR TEAM LEVEL

DĂNUȚ MĂRZA DĂNILĂ<sup>1</sup>

**REZUMAT. Modalități de dezvoltare a rezistenței specifice jocului de volei, prin metoda cu intervale, la nivelul unei echipe de seniori.** Prin această cercetare am dorit să oferim, date obiective care să constituie argumente pentru faptul că rezistența generală și specifică, reprezintă o aptitudine psiho-motrică strict necesară voleibaliștilor, fiind suportul dezvoltării și educării celorlalte aptitudini, dar și a deprinderilor motrice specifice jocului de volei.

Scopul principal al acestei cercetări, l-a constituit dezvoltarea rezistenței specifice jocului de volei la nivelul seniorilor, prin metoda cu intervale.

Eșantionul de subiecți s-a constituit din jucătorii echipei de volei masculin Știința Bacău, participantă în Campionatului Național de volei seniori.

Cercetarea a fost eșalonată în trei etape, fiecare corespunzând unei perioade în care s-au folosit mijloacele de acționare specifice dezvoltării rezistenței specifice jocului de volei.

Probele de control folosite pe parcursul cercetării au fost: *1000 m plat, și alergare de durată - 7'*. Alergarea se face pe pistă, în grupe de 6 sportivi o singură dată.

Bazându-ne pe rezultatele obținute de sportivi la testarea inițială, rezultate care reflectă dezvoltarea rezistenței acestora, a fost structurată metodologia de acționare pentru aceștia în așa fel încât să se realizeze obținerea unor progrese mai rapide în dezvoltarea rezistenței specifice.

Pornind de la metodologia generală de utilizare a metodei cu intervale pentru dezvoltarea rezistenței, adaptată antrenamentului de volei, s-au elaborat și structurat sisteme de acționare specifice scopului urmărit.

În urma aplicării acestor sisteme de acționare, la testele finale s-au obținut rezultate peste așteptări privind dezvoltarea rezistenței prin metoda cu intervale.

Probele de control fiind direct subordonate scopului cercetării, au scos în evidență superioritatea metodologiei folosită pentru dezvoltarea rezistenței specifice jocului de volei.

De remarcat a fost faptul că, buna organizare a activității, mijloacele folosite pe parcursul pregătirii au avut influență pozitivă și asupra celorlalte aptitudini psiho-motrice, nivelul general al indicilor pregătirii fizice generale și specifice crescând.

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Dacă mijloacele folosite în antrenamentele desfășurate în aer liber, au avut un efect direct asupra capacității generale de efort, deci a rezistenței generale, mijloacele specifice folosite în sală (complexele de exerciții cu elemente din jocul de volei), au avut o influență deosebită și au dus la o creștere remarcabilă a indicilor rezistenței specifice jocului de volei, fapt remarcabil prin prestațiile foarte bune ale jucătorilor din timpul jocurilor oficiale.

### **Introduction**

By means of the present research we have meant to offer objective data that could turn into arguments for the fact that the general and the specific resistance is a psycho-motion skill strictly necessary to volleyball players, as it is the support for the development and the education of the other skills, as well as of the motion skills specific to volleyball.

The main purpose of the present research was the development of the resistance specific to volleyball on the level of senior players, by using the method with intervals. Thus, we have tried to bring a real contribution to the improvement of the methodology for the development of the general and the specific resistance of the volleyball players, by using some efficient means specific to this method.

We have considered it to be an up-to-date topic, especially because of the necessity of finding some proper solutions for improving the specific resistance indexes in the case of volleyball players.

### **Hypotheses and tasks**

The hypotheses of the present research can be stated as follows:

1. Can the efficiency and the attractiveness of the means specific to the method with intervals used during the training process solve the development of the resistance specific to volleyball players, according to the present objectives and requirements of the performance in volleyball?
2. Can the efficient organization of the work into teams, in order to be able to observe, during the training, the main characteristic of the method with intervals (the duration of the breaks of incomplete recovery) determine the achievement of some spectacular results in the development of the resistance specific to volleyball?

Tasks of the research:

- a) To gather data and information concerning the methodology for the development of resistance in general, and particularly by using the method with intervals;
- b) To establish the content of the research (place, methods used, steps etc.), and also to choose the group of subjects;
- c) The development of the research itself;
- d) To process the data and the information and to emphasize the characteristic aspects of the study;

- e) The analysis and the interpretation of the results of the research, emphasizing the main conclusions, with a theoretical and practical value in the development of the specific resistance of volleyball players on the level of the senior teams.

During the research, in order to solve the problems that came up we have used the following research methods: the theoretical documentation, the observation and the recording of the important aspects, the assessment and the evaluation by means of tests and control tests, as well as statistical-mathematical methods and graphical representations for the processing and the analysis of the data and the interpretation of the results.

The group of subjects was made up of the players of the male volleyball team Știința Bacău, team that took part in the National Volleyball Championship for seniors.

The research itself took place in the period of time August - December 2005. The research was actually divided into two stages, each corresponding to a period of time when specific methods were used for the development of the resistance specific to volleyball.

The control tests used during the research were:

**1. 1000 m flat.** The running is performed on the track, in groups of 6 sportsmen at a time.

**2. the long timed running - 7'.** The running is performed on the track, in groups of 6 sportsmen at a time.

We have chosen these tests because they have been used by coaches and can be considered as representative for the purpose of the research.

Based on the results the sportsmen have got during the initial testing, results that reflect the development of their resistance, a methodology has been structured for them so as to achieve faster improvements in the development of the specific resistance.

During the physical training and even during other trainings, we have used a set of methods specific for the development of the resistance specific to volleyball, using the method with intervals, taking into consideration the possibility of performing the training outdoors or indoors, frame plans being made up at the beginning, which could give the possibility of adapting their content to the actual working conditions.

Starting from the general methodology of using the method with intervals for the development of the resistance, adapted to the volleyball training, we have made up and structured action systems specific to the purpose.

### **Presentation of the data**

#### ***I. Action systems specific to outdoor training***

These systems of methods have been used according to the pre-established schemes, during the first stage (August - September 2005) of the research:

##### ***A. Methods for resistance specific to the 1000 m test***

- a.** 3 x 300 m;      1 x 200 m.
- b.** 2 x 400 m;      1 x 300 m.
- c.** 2 x 250 m;      1 x 300 m;      1 x 400 m.

The duration of the breaks between repetitions, between 45 and 90 seconds, according to the returning of the pulse around the value of 120 throbs/minute.

*B. Methods for resistance specific to the 1000 m flat running test - 7 min.*

Running with intervals, on a flat field, with a uniform tempo (3/4), according to the following pattern:

- 120" - running/ break 45-60" - the returning of the pulse around the value of 120 throbs/minute;
- 150" - running / break 45-90" - the returning of the pulse around the value of 120 throbs/minute;
- 180" - running / break 45-90" - the returning of the pulse around the value of 120 throbs/minute;
- 150" – running / break 45-90" - the returning of the pulse around the value of 120 throbs/minute;
- 120" – running / break 45-90" - the returning of the pulse around the value of 120 throbs/minute;

The start is marked by a sound signal, running on a marked route (track). On hearing the sound signal, after a session of running the sportsmen stop, do breathing exercises and continue to move walking slowly, until the next sound signal announcing a new session of running. During each break after 30 - 45" the sportsmen will take their pulse on 10", in order to control as much as possible the duration of the breaks. This system has been programmed for every other training of the week, the sportsmen having to go through a certain pre-established distance during each running session.

## ***II. Action systems specific to indoor training***

For the second stage (October - November 2005), action systems specific to the game have been used, systems made up according to the general methodology for the development of the resistance by means of the method with intervals, as follows:

### **System no. 1**

- 10" - left sideways movement – right between two lines drawn 3 meters from each other, by touching them with the hand;
- 10" - break for the recovery of the pulse;
- 20" - forward movement – back between two lines drawn 6 meters from each other, by touching them with the foot;
- 20" - break for the recovery of the pulse;
- 30" - simulation of the block jump, touching with the hands a spot as high as possible;
- 30" - break for the recovery of the pulse;
- 40" - ankle exercise on the place, running on the place, running knees to the chest on the place (very high tempo) and bouncing step on the place, will be performed in sessions of 10 seconds;
- 40" - break for the recovery of the pulse;
- 50" – simulation of the attack jump, touching a place as high as possible;

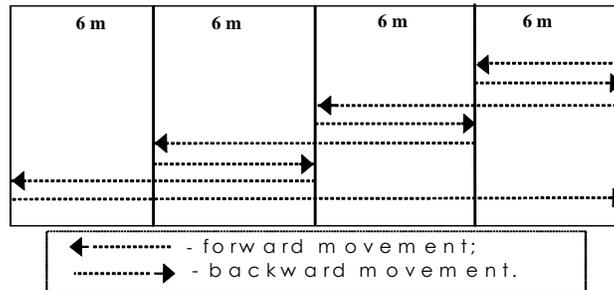
MEANS OF DEVELOPING THE RESISTANCE SPECIFIC TO VOLLEYBALL

- 50" - break for the recovery of the pulse;
- 60" - defense movements (shifting, plunges etc.) mixed with jumps specific for attack and blocking performed in the mirror (one sportsman performs, the other imitates his movements);
- 60" - break for the recovery of the pulse:

**System no. 2**

The exercises included are the same as the one in system no. 1. Their performance will be made in the opposite order, starting with the defense in the mirror and ending with the sideways movement, following the times allotted to each exercise of the system.

**System no. 3**



- 30" - mixed movement according to the scheme above;
- 30-45" - break for the recovery of the pulse;
- 30" - simulation of the jump at the net, with the retreat to the 3 m line (maximum speed);
- 30-45" - break for the recovery of the pulse;
- 30" - jumping step;
- 30-45" - break for the recovery of the pulse;
- 30" - jump to block after the left sideways movement - right 3 m. passing with the hands as high as possible over the net;
- 30-45" - break for the recovery of the pulse;
- 30" - jumping knees to the chest;
- 30-45" - break for the recovery of the pulse.

These systems have been used weekly during the second stage of the experiment, all along the indoors training. The systems have been used first of all during the trainings for the development of psycho-motion skills, but also during the technical and tactical training, either after the warm-up or to the end, performing a smaller number of sets and repetitions this time (1-3).

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The systems suggested have been used during the second stage, according to the following scheme:

Week Methods	Week 1		Week 2		Week 3		Week 4		Week 5		Week 6		Week 7		Week 8	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Training																
System no.1	X	-	X	-	-	-	-	-	X	-	X	-	-	-	-	-
System no.2	-	X	-	X	-	-	-	-	-	X	-	X	-	-	-	-
System no.3	-	-	-	-	-	X	-	X	-	-	-	-	-	X	-	X
System no.1+2	-	-	-	-	X	-	X	-	-	-	-	-	X	-	X	-

The number of repetitions has been between 1 and 7 sets, for each system separately during most of the trainings and between 1 and 5 sets, when systems 1+2 have been performed together, only during the physical trainings.

This method of combining the systems mostly eliminated the monotony during the trainings, the sportsmen taking part in them with pleasure.

The methods used during the outdoors trainings have had a direct effect on the general effort capacity, thus of the general resistance, and the specific methods used indoors – the systems of exercises with elements from volleyball, have had a special influence and have led to a remarkable increase of the resistance indexes specific to volleyball, fact which was also noticed during the official games.

**Results**

After applying these action systems, during the final tests we have got results beyond expectations concerning the development of the resistance my means of the method with intervals.

As the control tests have been directly subordinated to the purpose of the research, they have emphasized the superiority of the methodology used in the development of the resistance specific to volleyball. In the tables below are presented the differences that emphasize the progress made between the two tests – the initial and the final one – for the specific tests (1000 m and 7-minute running). These results are the arithmetical averages of the results achieved during the tests.

	1000 m	7 min running
<b>Initial</b>	3,24=204"	1892 m
<b>Final</b>	3,12=192"	1980 m
<b>Difference Final - Initial</b>	<b>12"</b>	<b>88 m</b>

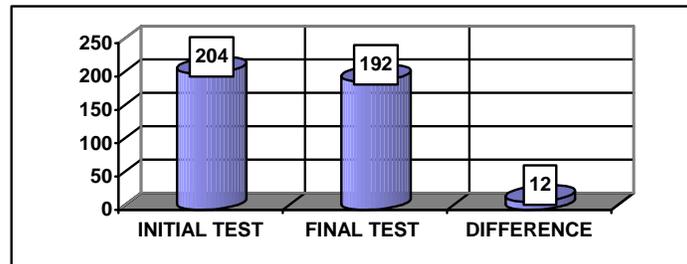
We will try to make below an analysis of the results of the research for each testing and test separately, in order to check the validity of the hypotheses and to be able to draw conclusions.

MEANS OF DEVELOPING THE RESISTANCE SPECIFIC TO VOLLEYBALL

The results of the 1000 m test can be considered to be relevant for the development of the resistance specific to volleyball, by using the method with intervals, the analyses achieved emphasizing some important aspects of the research.

The results are presented in the table below and represented in graphic nr. 1.

	<b>RUNNING 1000 M</b>
<b>INITIAL TESTING</b>	<b>3,24=204"</b>
<b>FINAL TESTING</b>	<b>3,12=192"</b>
<b>DIFFERENCE</b>	<b>12"</b>



**Graphic no. 1** – Results of the 1000 m running resistance test

During the initial testing, the arithmetical average of the team’s results has been of 204”, and during the final testing it has been of 192”; we notice a difference of 12 seconds.

Thus, we can notice that during the 1000 m test the progress achieved by the sportsmen has an average of 12” between the initial testing and the final testing, which proves that the methods used have had a positive influence on the development of the resistance.

The 7 min. running test has been chosen in order to give us a better idea of the level of resistance of the sportsmen’s body and to emphasize as clearly as possible the progress achieved, since one single test wouldn’t be enough to check accurately the hypotheses of the research. The 7 min. running test has been chosen to prove once again the real level of the resistance on this level.

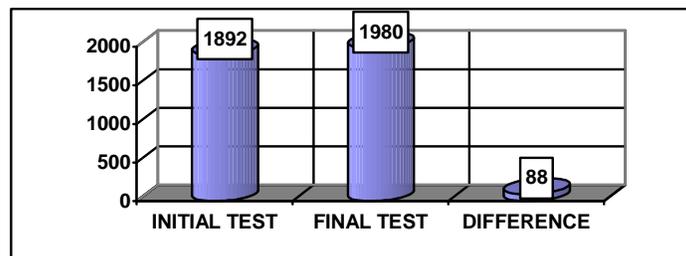
The results are presented in the table below and represented in graphic nr. 2

During the initial testing, the arithmetical average of the team’s results has been of 1892 m, and during the final testing it has been of 1980 m; we can notice a difference of 88 m on the level of the whole team.

During this test we have also noticed an obvious progress of all the players of the team, fact which proves that all the methods used for the development of resistance have been well-chosen and have contributed to the development not only of the general resistance of sportsmen, but also of the specific one.

A fact which is worth mentioning is that the good organization of the activity, the methods used during the training have had a positive influence on the other psycho-motion skills, the general level of the general and specific training indexes increasing.

	<b>RUNING 1000 M</b>
<b>INITIAL TESTING</b>	<b>1892</b>
<b>FINAL TESTING</b>	<b>1980</b>
<b>DIFFERENCE</b>	<b>88</b>



**Graphic no. 2** - Results of the 7 min. running resistance test

While the methods used during the outdoors training have had a direct effect on the general effort capacity, thus of the general resistance, the specific methods used indoors (the systems of exercises with elements from volleyball), have had a special influence and have brought a remarkable increase in the indexes of the resistance specific to volleyball, fact which showed in the very good performance of the players during the official games.

### **Conclusions**

The results obtained during the research finally led to some important conclusions which proved the validity of the hypotheses stated in the beginning:

1. The application during the training of the means specific to this method had an influence on the physical capacity of the players also due to the good organization of the effort required by these means so that the activity can take place in good conditions, with increased sports efficiency.
2. Choosing some exercises and means specific to the method with intervals, adequate to the morpho-functional and training particularities, we can get rid of the monotony during the training for the development of resistance, thus leading to an aware and active participation, with increased efficiency of the sportsmen.
3. The differences between the final and the initial testing prove the progress achieved, so they can be considered to be a first step in checking the hypotheses

## MEANS OF DEVELOPING THE RESISTANCE SPECIFIC TO VOLLEYBALL

- suggested at the beginning of the research and emphasize the value of the means used in order to develop the resistance specific to volleyball.
4. The progress achieved confirms the hypotheses concerning the development of the resistance specific to volleyball by using the method with intervals, hypotheses stated at the beginning of the research.
  5. The efficiency and the attractiveness of the means specific to the method with intervals used during the volleyball training solve the development of the resistance specific to volleyball players, according to the requirements of the game, to the present objectives and requirements of the performance.
  6. The efficient organization of the work into teams, in order to be able to observe, during the training, the main characteristic of the method with intervals (the duration of the breaks of incomplete recovery) determine the achievement of some spectacular results in the development of the resistance specific to volleyball.

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DĂNUȚ MĂRZA DĂNILĂ

## PRESENTS REGARDING THE SOMATIC PROFILE OF THE JUNIOR ATHLETES IN RHYTHMIC GYMNASTICS

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ILEANA BARBU<sup>3</sup>, ELENA SABĂU<sup>2</sup>

**REZUMAT. Date recente privind profilul somatic al sportivelor junioare in gimnastica ritmică.** Evoluția actuală a gimnasticii ritmice necesită o reanalizare a profilului somatic, psihologic și motor la sportivele junioare din această ramură.

Această lucrare a examinat datele somatice înregistrate de Institutul Național de Medicină Sportivă în perioada octombrie 2003- iunie 2006 a gimnastelor cu vârste cuprinse între 12 -13 ani, membrii ai echipei naționale la individual sau ansambluri. Selecția sportivelor în echipa națională a fost făcută pe baza unei selecții preliminare în concordanță cu criteriile somatice, tehnice și motorii specifice.

### Introduction

The present evolution of the worldwide rhythmic gymnastics and the complex interaction of the performance technical and esthetic-artistic factors urge a reconsideration of the anthropological and somatic model of athletes.

It appears while the somatic harmony, based of long lines proportions and sub weight, becomes extremely important for the esthetic evaluation of performances.

In the course of time, the analysis of somatic model for rhythmic gymnastic athletes had pro and contra opinions. The adverse opinions have, as central point, problems regarding the nutrition indicators.

Many times, the wish to correspond to some norms of specific somatic harmony, have as result the athletes starve and such situation was criticized specially by specialized physicians. The danger of nutrition troubles, in a body under sports strong efforts, is bigger for gymnasts which start their preparation in childhood, having a strong development in puberty period and ending, in most of cases, in adolescence.

The longevity of some athletes depends also on balance between proportion and weight indicators.

In every stage, from beginners to high performance, the weight indicators become essential ones to support efforts, especially in the case of articulations.

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### **Motivation and goal**

In the National Institute of Sports Medicine (INMS) of Bucharest, for each sports discipline, there is a general model of anthropological and somatic development. All investigation results, in medical circuits, periodically carried out, are referred to such model.

Taking in mind the rhythmic gymnastics existing data, we consider necessary to re-analyze the real profile of performing athletes. There is a reason, the existence of problems in selection activity, especially in connection with the biometrical development of children.

This work has as goal to check objectively the developing somatic and anthropological profile of rhythmic gymnastic athletes.

The study regards the level of 12-13 years old athletes, which represents the ground of the future high results.

**METHOD:** research of descriptive type

### **CONDUCT of RESEARCH**

Has been analyzed all anthropometric and somatic data, gathered between July 2004 - March 2006, during the medical circuits, held by the INMS, in all 40 charts.

As subjects, were 12/13 old juniors, which took part in selections and/or in the preparation of national teams.

The standard data of specific medical INMS circuits have been distributed according to 3 categories of the most significant anthropometric indicators for the Rhythmic Gymnastics:

**I. Indicators of longitudinal proportions:** waist, length of bust, length of feet.

Have been calculated relations like: bust/stature ("A. Ionescu indicator"), feet length/stature.

**II. Indicators of transversal proportions:** biacromial diameter, bitrohanteral diameter, span.

As per relations: span/stature, biacromial diameter/stature, bitrohanteral diameter/stature.

**III. Weight indicators:** present weight, optimal weight, active mass (in kg), optimal active mass, standard active mass, adipose tissue (%), relations between specific proportionality and Quetelet index.

The gathered data have been put in tables and analyzed statistically and calculating the arithmetical mean, standard deviation and variability coefficient.

The proportionality indicators were calculated according to INMS standard formulas. The final results were correlated with standards of normal population of 12-13 years old and with the performer biological model (Dragan, I., 1989, 2002).

## RESULTS AND INTERPRETATION

### I. Indicators of longitudinal proportions

Longitudinal proportion relations show values higher than the standard of normal population of such age (table No. 1).

Table no 1 Longitudinal proportions

Longitudinal proportions			Relation index		
IND ST	waist	bust	feet	A Ionescu	Feet /height
X	147.98	74.92	73.18	3.1	49.45
S	6.75	3.42	3.42	Standard values	
CV	4.56	4.56	5.57	3.1	47.97

The relation indicators in connection with standard values shown in the table, make evident a specific harmony based on long segments, which favors a harmonious somatic development.

The calculated statistical values are significant and show a higher homogeneity threshold.

### II. Indicators of transversal proportions

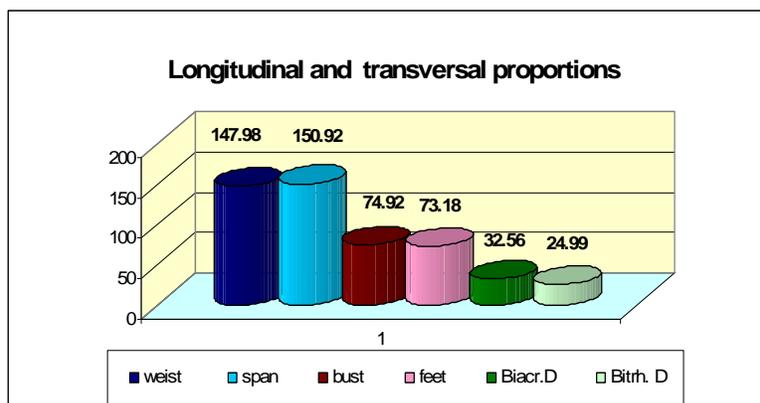
Such kind of indicators (table No. 2) show the same tendencies like in longitudinal proportions, with better values than the standard ones for a normal population.

Table no 2 Transversal proportions

Transversal proportions			Relation index			
IND ST	D biaro	D Bitr	Anverg	span /height	BiacrD /height	BitrD /height
X	32.56	24.99	150.92	101.98	22	16.88
S	2.44	1.65	5.55	Standard values		
CV	7.49	6.6	5.5	100.63	21.38	17.73

The biacromial diameter is more evident than the bitrohanterical one and together with the span/height relation is in accordance with biological model of performing athletes.

All indicators of proportionality appear in the enclosed diagram.



### III. Weight indicators

The weight indicators (table no. 3) show a position at the superior limit of the INMS optimum profile and the calculated nutrition index is 4.7.

Table no.3. Nutrition values

	Optim. Weith	Active mass kg	Opt Mass opt	Standard mass	Adip tissue%	Present weight
<b>X</b>	33.20	33.79	29.89	30.68	38.15	10.16
<b>S</b>	3.83	3.77	3.54	3.42	0.55	5.89
<b>CV</b>	11.53	11.15	11.84	11.14	17.79	15.43

The percentage of adipose tissue (10.16%) is in the frame of the model (under 11% of weight). In our opinion, such indicator still could be improved, taking in mind the somatic harmony in the rhythmic gymnastics.

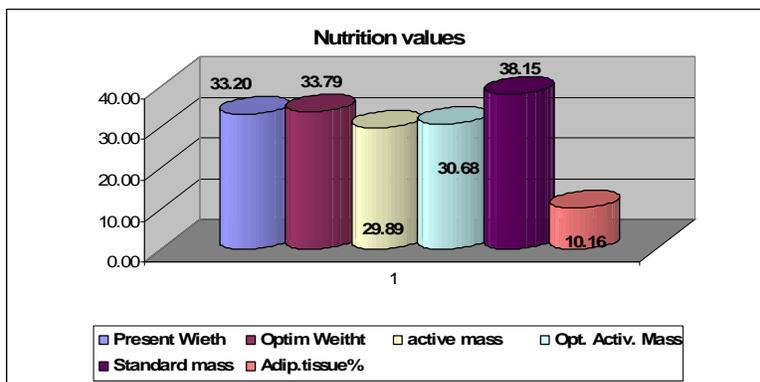
The relation between waist and weight show a difference of 14.77 kg, below the cm figure of a waist above 100 and such situation belongs also to the higher limit of the model (13-15 kg).

The values of indicators regarding the present / optimum weight are approximately equal as well as the active mass values. The real values are better and it shows the beneficial role of the training.

If we regard the mean calculated value of the standard active mass, we may see the athletes have really low values.

The analysis of the variability coefficients shows a mean level of homogeneity and our interpretation is based on changes in the body composition, which is specific for such age.

All nutrition indicators appear in the enclosed diagram.



## CONCLUSIONS

The calculated values correspond to standards of performers' biological profile.

There is a somatic harmony based on long lines proportions and low nutrition indicators.

Comparing the calculated values with the general standards of same age population, becomes evident the benefits of the Rhythmic Gymnastics for the harmonious developing of the female population.

The critical examination of the results and their statistical interpretation offer useful data for the practical activity. Therefore all RG Depts. of sports clubs affiliated to the Romanian Rhythmic Gymnastics Federation as well as the Sports Medical Centers will receive it.

In the practical area, there is necessary to up-to-date the specific profiles, especially for such fields where the somatic harmony has direct and sometimes definitive implications in the evaluation of the sports performances.

Therefore, urge a comparative analysis of all these profiles in view to fix up the specific influences of each sports discipline as well as the benefits for the somatic and anthropological development.

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SABINA MACOVEI, GEORGETA NICULESCU, ILEANA BARBU, ELENA SABĂU

## BIO-MECHANICAL, TECHNICAL AND METHODOLOGICAL PERSPECTIVES ON THE PARALLEL BARS EXERCISES

EMILIA FLORINA GROSU<sup>1</sup>

**REZUMAT. Aspecte biomecanice, tehnice și metodice la bară fixă și paralele inegale.** În gimnastica artistică dificultatea elementelor a atins un apogeu în ceea ce privește tehnica de execuție. Este foarte important de a cunoaște analitic fiecare element component al exercițiului, pentru a realiza o tehnică perfectă. Alternanța mișcărilor liniare cu cele unghiulare, cum se întâmplă în cazul elementului Tkacev, Delcev necesită cunoașterea legilor fizicii și aplicarea lor în practică, în timpul antrenamentului. Numai în felul acesta se pot atinge culmi ale virtuozității în execuția de la aparate.

### Rotation movement moments and angular rotation equations

Gymnastics is very much about body-rotation movements, which fall into two types:

- a) free rotation, in which there is no fixed point for the gymnast to rotate around but a free trajectory, i.e. somersaults, vaults and all flying movements.
- b) fixed-point rotation, in which the gymnast supports his/her weight on the gym apparatuses such as the various types of parallels (horizontal, uneven, etc ...)

The angular rotation is generally measured in degrees, a 360 degrees being a full tour.

### The relationship between angular and linear rotation

Let's take a look at horizontal bar or uneven parallel bars gymnastics (fig. 1). The gymnast has to start from an upright handstand position (OB), with an initial angular speed equal to zero. The maximal angular speed will be reached in the lowest part of the swing (OB<sub>1</sub>). It is thus possible to determine each body-part's linear speed by multiplying the angular speed with the corresponding distance between the body-part and the rotation point  $v = w \times h$ . For example, the weight center will be about 1 meter away from the rotation point. Thus, in the case of a 1.6 m tall gymnast, the angular speed of his/her weight center will be  $v = w_{max} \times OG = 5,5$  m/s.

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In keeping with that, the angular speed of the body's fastest moving part (that is, the toes, for which  $h =$  approximately 2m) will be  $v_{max} = \omega_{max} \times OB_1 = 5,5 \times 2 = 11\text{m/s}$ . These being said, we are now able to examine those elements of gymnastics in which a flight and rotation are required.

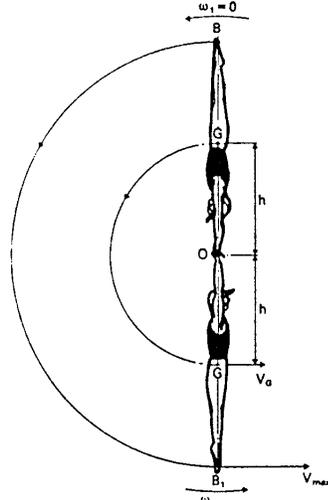


Fig. 1

Being able to determine the centrifugal force carries a lot of relevance in gymnastics as it allows the calculation of the forces acting upon the gymnast during the rotation movement. The two forces, centrifugal and centripetal, act against one another, and since their sum has to be nil to avoid coming off the bar, it means that the centripetal force is the bodily tension preventing that. The centrifugal force will be maximal when the angular speed is maximal, that is in the lowest point of the swing (OC). At this point the gymnast will have to put up with a total weight marked  $R$  which is equal to the sum of the body's weight  $P$  and the centrifugal force  $F$ .

Thus  $R = P + F$ . We will show later that  $R$  can reach five times the bodyweight's value at the lowest point in the case of ample swings. The rotation speed is also important in vaults at parallel bars. There are two such examples in figure 2a and b. 2a is a inverted grip Delcev or a normal grip Yager vault. It is a forward vault with straddled legs and grasping the higher bar. 2b is grasping the higher bar after a straddled-legs fwd vault (Delcev) using the momentum of a swing on the same bar. To accomplish that, the inertial moment around the transversal axis (which is the body's rotation axis) needs to be brought down by taking up the best position –  $90^\circ$  straddled legs as shown. The greater the aperture of the legs, the more important the closing angle between the legs and the trunk,

and the lesser the inertial moment's value with corresponding beneficial effects – an increased rotation speed rendering the movement easier to perform. To conclude, the amount of movement is of key-importance in these elements.

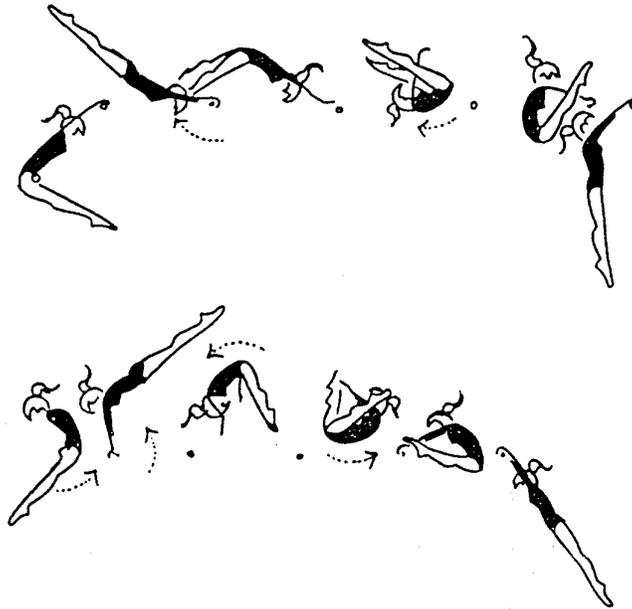


Fig. 2 a, b

Teaching the Yager element, for instance, follows these steps: compact Jager vault from back swing with straight or straddled legs, re-grasping the bar, C-value. Figure 3, compact vault.

#### **I. Technical description of the element** (Grosu E., F., 2003)

Taking into account the level of complexity and difficulty of this element, the training process starts with the basic structure: fwd vault in “L”-position followed by re-grasping from fwd Yager giant vault. Once this element is acquired, it is possible to go on to learning and consolidating the next steps, the more elaborate elements such as the straight Yager vault as well as the cubital grip giant vault. The assimilation phase ends with the acquisition of these two elements. The final phase is represented by acquiring, consolidating and refining the straight Yager vault with cubital grip from giant position. This process is a rather lengthy one, taking up about 5 or 6 years.

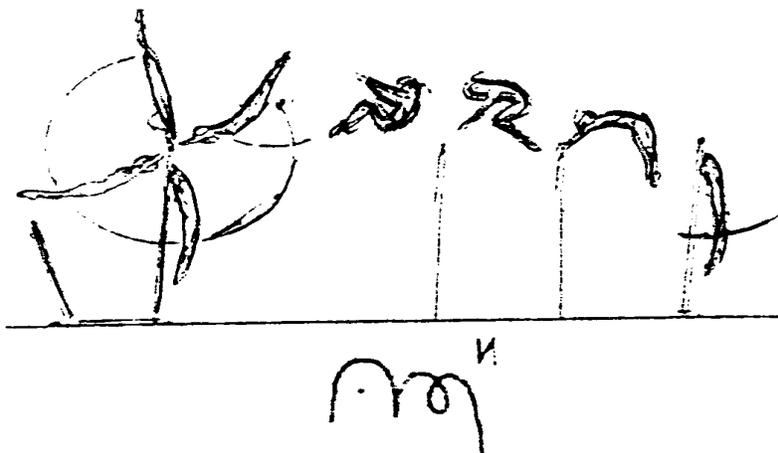


Fig. 3

## II. The methodical succession

1. At horizontal bar, fwd swing and fwd compact vault, landing on the sponge mattress.
2. At horizontal bar, fwd swing and fwd "L"-position vault, landing on the sponge mattress.
3. At horizontal bar, fwd giant vault sped up by thrusting the shoulders fwd.
4. At horizontal bar, fwd giant vault sped up by thrusting the shoulders fwd and heel-projection through coxo-femural and scapulo-humeral joint extension. This position will be kept up until the body and the vertical come to a 45° angle.
5. At horizontal bar, fwd giant vault with all preparatory speeding actions, rebound and heel line-up to the direction of the vault without actually releasing the bar.
6. At horizontal bar, from upright handstand position, free fwd fall followed by the actions in 5.
7. At horizontal bar, from fwd giant plus the actions in 5 and 6, fwd "L"-position vault, landing flat on arms on the mattress.
8. At horizontal bar, by driving heels as close to the vertical as possible at the take-off, the vault goes higher and higher. Thus the gymnast gets closer to the bar and the coach provides protection by pushing the safety sleeve on the bar.

## III. Mistakes and mistake-correction.

- insufficient rebound and a hasty start resulting in a low vault;
- tardy release of the bar;
- too slow movements of head, hip and arms.

**IV. Help and safety measures** Help will be provided by means of the longe.

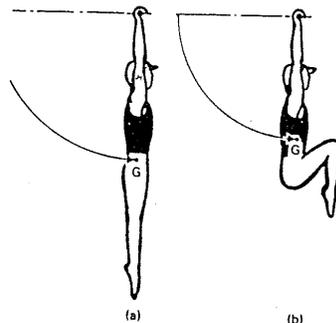
*Note: the “L”-position Jager vault, D-value, and the stretched vault, E-value.*

**The angular movement, the fixed point rotation and the kinetic moment.**

We have already established that the force applied to a body causes it to accelerate or decelerate its speed. The acceleration is there even if the speed modification consists in changing only the direction. This type of speed variation is present in some very important cases such as the angular trajectories or body rotations.

*Fixed point rotation*

We will now look into what is involved in the case of fixed point rotation. Figure 4 shows a gymnast balancing freely at parallel bars. At the start, there is a full extension of the gymnast’s body and the inertial moment around the rotation point is maximal. The rotation speed can be increased by shortening the body length and thus decreasing the inertial moment as shown in Figure 4b. This brings the body weight closer to the rotation point and speeds up rotation. Of course the reverse is also true. This explains why, during the balancing movements, such as ample swings, rotations, backwards vaults, the gymnast brings his/her weight center closer to the bar when passing it by during the second half of the rotation. This allows bringing down the rotation counter moment due to the gravitational pull and thus the optimal end to the tour (giant vault).



**Fig. 4**

*The angular kinetic moment<sup>2</sup>*

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The term is taken and adapted from “Biomecanique et gymnastique” – Pratique corporelles, de Tony Smith (1991).

Just like a body that moves on a linear trajectory has a kinetic moment, a body that rotates around any axis will have an angular moment, this being equal to  $J \times \omega$  (where  $J$  = the inertial moment and  $\omega$  = the angular speed). Thus, the two equations, linear moment =  $m \times v$ , and angular moment =  $J \times \omega$ , are in direct relationship to one another.

During some moves, provided that the kinetic angular moment stays constant, a decrease in the inertial moment ( $J$ ) will bring about faster rotation and the other way round. It means that long levers rotate slowly while short levers rotate fast. A body can only rotate if a moment of rotation forces applies on it. The shorter the radius (smaller inertial moment), the easier to start and the faster the rotation. That is why it is more convenient to rotate body-compact than stretched.

As a consequence, body-compact rotations, which are both faster and easier to perform appeal to gymnasts quite a lot. By adopting a straddled leg position during double or treble vaults, they aim to reduce the inertial moment as much as possible and obtain the maximal rotation speed. The conservation principle in the case of angular movement can be demonstrated in the technical analysis of elements below.

#### THE PIRQUETTES

As demonstrated above and easily proven empirically, the rotation speed increases if various body parts assume a compact position and it decreases if these parts get further from the weight centre. Arms, as a result, can be used to speed up or slow down rotation.

Figure 5 shows different body positions. Figure 5a shows the smallest possible inertial moment, but in practice this position can only be used in a restricted series of movements, especially when compared with flip vaults or to the pirouettes.

In many flip movements, the arms assume a similar position to that in Figure 5b. When the gymnast cannot stretch arms above his/her head, this is the most efficient position to rotate around a longitudinal axis.

The body tight position shown in Figure 5c is quite frequent in flips. Tightening the body like that can cut down on the rotation speed considerably. Figure 5d presents the worst case of all because it shows not only stretched arms, but also an important bend of the body. Here the inertial moment is four times bigger than in Figure 5a. Flipping or pirouetting is not only lacking in aesthetics, but also lacking real chances of achievement.

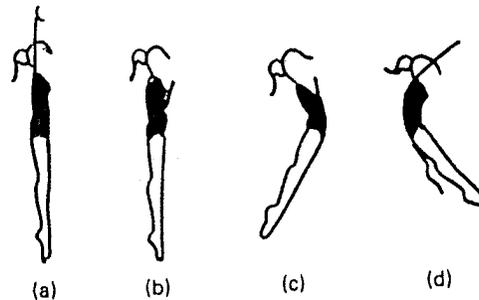


Fig. 5

## ROTATIONS

Rotations are full movements of the body around one or more axes, starting from either a support or a hanging position, or both. One of the major characteristics of rotations lies in the circular trajectory of the body as its weight centre goes further and closer to the support (hanging) point in respect to the initial position. The rotations group is made up from both simple structure movements and more complex ones, which include one or more actions before, during, or after the rotation.

By their axis, rotations fall into the following categories:

A. *Transversal axis rotations:*

B. *Longitudinal axis rotations (pirouettes):*

C. *Combined rotations (mixture of different axis rotations or rotations combined with bar passings):*

D. *Support point rotations (backward rotation from handstand with straddled legs around the arms (Stadler) can be performed on either of the bars.*

*Variants: Stalder with a 180° flip or (Teslenko) C-value or 360° D-value, with a 540° flip (Chorkina-Chow)=element E (Figures 6, 7 )*

- the flip is performed during the second part of the movement, once the legs are opened around the arms from handstand position.

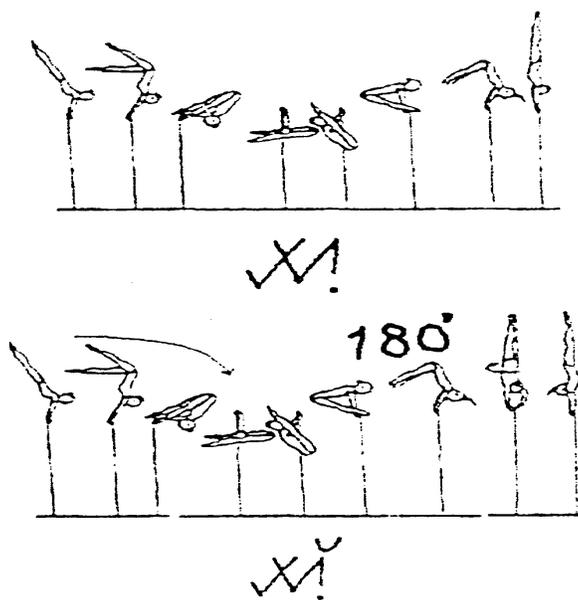


Fig. 6

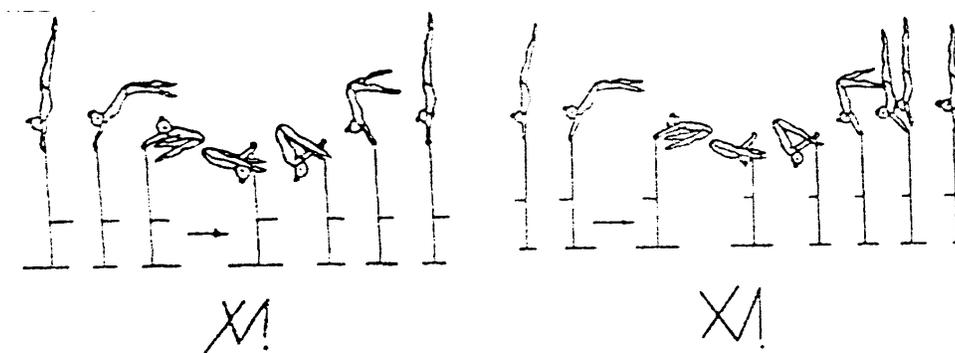


Fig. 7

*Backward Stalder, passing back the bar from hanging position (Kessler)*

This element relies on three phases:

- a. The Stalder;
- b. The Blocking;
- c. The free backward flight over the bar.

- only the backward Stalder is performed, unfinished (about 15° to the upper vertical);

- here the legs are blocked, transferring speed from the legs to the support points, the body getting stiff. The speed variation charges the bar at the contact point;
- slightly pressing the bar backwards opening the legs, pulling back the pelvis and blocking the body stiff produces the energy for the take-off and the control flight. It ends in hanging position on the same bar.

## II. The methodical succession

1. Lying flat on back, arching the body upwards, throwing the legs forward to the blocking point, pulling back the pelvis and opening the legs from standing on the bottom (this drill serves to acquiring the blocking legs phase plus passing them over the bar in the right position).

2. On the lower Stalder bar, blocking and passing the bar backwards and forwards with straddled legs from standing on the mattress position. The Stalder will be learned just like its lower parallel bar variants, using help and soft superposed mattresses.

### I. Technical description of the element (*Tkacev*)

Using a full swing (as if for a backward giant vault), pass over the lower bar than a slight body bend opened full just before the lower vertical, followed by a strong, rebound up-forwards, opened arms, head bend forward. As a result of the early rebound, the feet go round slower and further away from the bar. Next, the active leg-blocking speeds up the body for the wave, followed by a full opening of the arms and lowering the chin. When the body reaches full arm extension, the gymnasts flings legs open and grasps the bar.

The trunk goes up, the pelvis goes a little down and over the straddled legs and the hips. After passing the bar, the body bends forward firmly, the arms reach down to grasp the bar, the pelvis goes on in its withdrawal movement, while the arms open to avoid the shock of hanging position and of touching the lower bar with the feet.

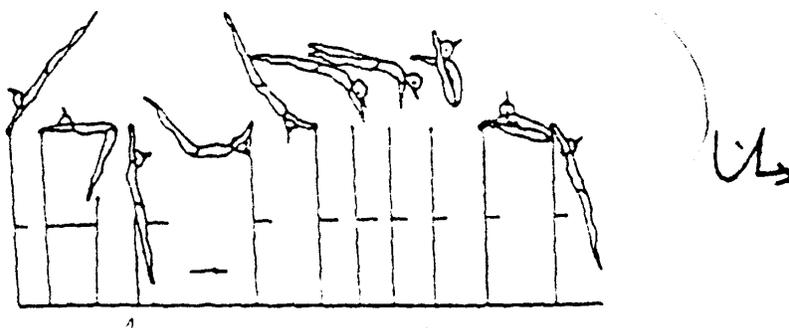


Fig. 10

## **II. The methodical succession**

1. At a small bar, from lying on back position, hands on the bar, backward rolling into a handstand. In between there is a mid phase: “L position”, extension blocking feet back, and leaning head forward.

2. From forward swing, feet blocking, trunk extension, very well spread arms, head forward, assisted release of the bar and landing on the mattress.

3. The same exercise, this time with an ampler swing and emphasized actions, without releasing the bar.

4. From forward swing, snap-swing and landing on the abdomen.

5. At Tkacev parallel bars, with assistance when grasping the bar.

## **III. Mistakes and mistake-correction.**

- tardy rebound under the bar;
- tardy feet blocking, insufficient trunk extension, insufficient arm spread
- passing the bar without corresponding pelvis withdrawal or forward leaning

## **IV. Help and safety measures**

Help will be provided by means of a longe.

*Delcev (“L”- position straddled legs vault, followed by a backward flip to hanging position) D -value (Fig. 11 )*

### **I. Technical description of the element**

At the lower vertical, the gymnast speeds up her feet, projecting them up-forwards. When the arms get into horizontal position, the body turns by 90°, the gymnast releases the bar and a further 90°turn in sagittal plan follows, as the legs are opened into straddling position.

As the legs go further, their speed decreases. The vault goes high enough over the bar for the performer to catch sight of it while on flight. During the downfall, as the gymnast reapproaches the bar, the legs get back together and the trunk leans forward to aid regrasping. Damping is achieved through increased self-control and muscle contraction: arm flexors, pectorals and deltoid muscles. The procedure works really well, but it asks for a lot of coordination skills as well as spatial and temporal orientation.

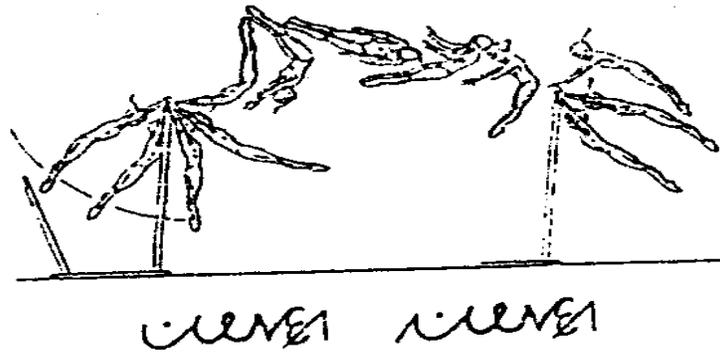


Fig. 11

## II. The methodical succession

Drill: getting between bars with a twist from standing position, getting between bars with an 180° twist and backward swing.

1. Element no 3 and 4 from Jager vault study drills will be used in order to reinforce the blocking and counter-rotation moment.
2. Driving feet up-forwards with a body twist on the side of the turn.
3. Mental execution of the movement.
4. Standing on the bars, in-depth jump to standing position.
5. Drill on landing at the sponge pit.
6. Delcev at the rebound net.
7. Longe-assisted execution of the procedure.
8. Safe protection execution of the procedure, the bar being sleeve-covered laterally.
9. Independent execution of the element.

## III. Mistakes and mistake-correction.

Insufficient getting between bars, insufficient turning.

## IV. Help and safety measures

Help will be provided by means of a longe.

*Derived, combined, and integral elements*

1. Compact backward vault with an 180° turn, to hanging position.
2. "L"-position Delcev vault, feet held close together, to hanging position.
3. Delcev, backward giant vault, Tkacev.
4. Introducing the element in a freely chosen exercise .

*Energy conservation and its application to rotation movements at uneven parallel bars and horizontal bar*

**Abstract**

1). Energy can neither be created or destroyed (that is, the total amount of energy always stays constant, irrespective of the energy forms we might consider). In gymnastics, energy keeps changing its form.

2). In gymnastics, the most important forms are the potential energy (due to height), the kinetic energy (due to speed), heat (due to frictions) and the tension, or the elastic energy (encapsulated in the apparatuses due to their deformation).

3). The friction-generated heat represents a loss of energy in gymnastics.

4). There is a natural adjustment of the balancing movement over the apparatuses. This is called period.

5). The height of the pendular balancing or the giant at horizontal bar or uneven parallel bars can be kept through body extension during the downfall and an "L"-position during the upward movement.

6). In order to optimize the effects in point 5, the body shortening must occur at the lower part of the swing, when the gymnast goes on to the vertical, below the suspension point.

7). At the end of the pendular balancing, the angular speed will be nil, and thus the centrifugal force will be nil.

8). The angular speed (the speed of the swing) will be maximal at its lower part, when the centrifugal forces exceed four times the bodyweight and the gymnasts can feel their pressure in such exercises as a giant vault at horizontal bar or uneven parallel bars.

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## THE DEVELOPMENT OF THE SKI SLOPES AND THE USE OF RURAL AREAS IN EASTERN VLADEASA MOUNTAINS

IOAN VIRGIL GANEA<sup>1</sup>

**REZUMAT. Dezvoltarea și valorificarea schiabil în zona rurală a Munților Apuseni de Est.** Lucrarea de față este rezultatul unui studiu de caz în zona Vlădeasa de est, Munții Apuseni și se referă la dezvoltarea domeniului schiabil, având în asociere strategică pensiunile agroturistice care deja există în zonă și care pot sprijini prin servicii specifice, activitățile de agrement hibernal. Prin aceasta încerc să contest amenajarea unei stațiuni montane la cota 1400 (Poiana Frânturii), fapt care ar crea un dezechilibru ecologic major în areal.

Most of the projects made to develop Vladeasa Mountains' natural potential, have left the rural areas aside in what concerns its partnership and share to the profit. A good example is the project done by Rotari Club which envisages building ski slopes while developing a ski resort in Poiana Franturii at 1400 m altitude. This project does not include the construction of chalets (or hotels) as they are available within 32 km, right at the foot of Vladeasa Mountain, and which are occupied only in the summer season.

Taking in consideration Vladeasa Mountains' natural potential concerning winter "outdoor" leisure, it surprises us that it has been so many years without being developed and accommodated. As well as other places from the Apuseni Mountains, Vladeasa has not been part of the national development projects.

My personal idea of a leisure and tourism person is entirely different. In order to promote, use and make a profit out of these investments I suggest the following steps within the making of the project.

- The evaluation of the accommodation potential within 30 km, around the ski slopes:

- motels
- hotels
- agro-touristic pensions
- schools
- chalets, etc.

Offer of accommodation in agro-turistic pensions at the foot of Vladeasa Mountains

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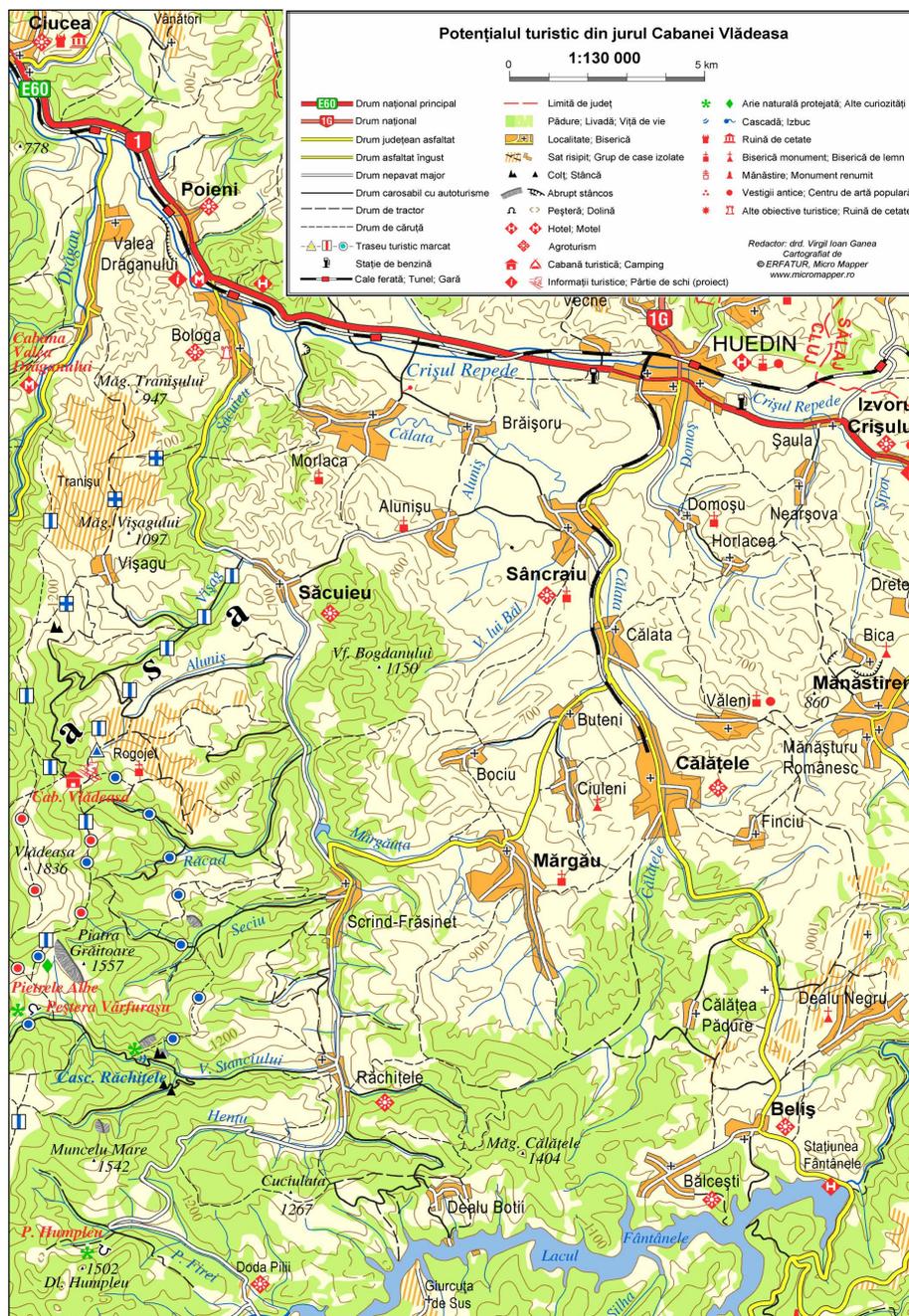
Place	Agro-turistic pensions	Accommodation capacity	Distance to Rogojel (ski slopes)
Sâncrai	35	181	32,5
Săcuien	25	98	7
Călățele	27	194	32,5
Răchițele	10	60	18
Scrind Frăsinet	3	18	13,5
Mărgău	4	32	21,5
Valea Drăganului	10	140	21,5
Poieni	6	42	16,5
Bologa	2	30	14,5
Rogojel	7	42	-
Vișagu	6	24	21,5
Total	135	861	-

Sursă: Ganea I. Virgil

- Starting off the work to the infrastructure of the ski slopes:
  - section I – chair-lift, ski slopes (Rogojel – Vladeasa Chalet)
  - car park at the foot of the chair-lift from Rogojel
  - spaces arranged to provide specific ski alpin facilities (sports gear hire, wardrobe, workshop for maintaining and mending sport materials)
- An advertisement announcing the opening of the ski resort
- Developing the human resources in the domain of the specific services

With this strategy the natives can make use of their accommodation facilities and the investor gets his profit from the parking services, the special services and the taxes for usage of the cable transport.

THE DEVELOPMENT OF THE SKI SLOPES AND THE USE OF RURAL AREAS IN EASTERN VLADEASA



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## VASCULAR DISEASE IN ATHLETES: PHYSIOPATOLOGY AND PREVENTION

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**REZUMAT. BOLILE VASCULARE LA SPORTIVI: fiziopatologie si preventie.** Sportul inseamna in principal performanta fizica, ce nu se poate realiza fara un aport sanguin adecvat. Patologia vasculara aparuta intr-o activitate sportiva aerobica si mascata de multe ori de o patologie neuromusculoscheletica poate compromite ireversibil hemodinamica vasculara in zona afectata dar si cariera sportivului. O varietate de sindroame clinice au fost descrise la sportivi dupa o injurie arteriala sau venoasa. Tulburarile vasculare localizate la nivelul arterelor pot fi: ruptura, anevrism, stenoza si ocluzie iar cele venoase pot consta din tromboza localizata pe venele superficiale sau profunde (tromboza venoasa profunda-TVP), cu consecinte deosebit de grave.

Mecanismele tulburarilor vasculare arteriale sunt diverse: traumatic, ischemic, pozitie corporala modificata si mentinuta indelungat, compresia vasului prin hipertrofie musculara, presiune crescuta in compartimentele gambei, rupturile repetate ale fasciei musculare. Tulburarile venoase, au ca mecanism principal formarea trombusului, ce poate modifica profund circulatia sanguina (ocluzie venoasa), si pot fi intilnite la alergatorii de rezistenta. In producerea TVP se considera implicati trei factori de risc ("Virchow's Triad"): distrugerea vasculara, flux sanguin anormal si modificarile chimice ale singelui. Distrugerea vasculara este cauzata de cresterea fluxului sanguin prin vas si a presiunii sangelui, de distrugerile oxidative si de alte stressuri ce se exercita in lungul vasului. Daca la cele enumerate se asociaza impactul doping-ului, riscul bolii vasculare (prin mecanism trombotic) creste, elementul patogenetic principal fiind cresterea vascozitatii singelui cu cca 25-30 %, predispusi fiind ciclistii si maratonistii. Manifestarea a suferintei survine de multe ori brutal, in efortul extrem si se traduce prin: durere intensa (posibil cu aspect de claudicatie intermitenta), modificari de culoare si temperatura ale membrului afectat, parestezii, dar care pot creea deseori confuzie de diagnostic. La suspiciune de suferinta vasculara explorarea se face prin: ultrasonografia Doppler, tomografie computerizata, arteriografie conventionala sau arteriografie de substractie digitala.

Preventia primara a acestor evenimente inseamna decuplarea verigilor patogenetice enuntate anterior, respectiv:

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*University Babes-Bolyai, Cluj-Napoca*

- Informarea sportivului asupra riscului de boala vasculara, pentru sportul practicat;
- O hidratare corecta a sportivului pe timpul efortului, pentru mentinerea homeostaziei sanguine;
- Renuntarea la substantele dopante, deoarece efectul acestora sumat la modificarea homeostaziei sanguine aparuta fiziologic in efort, poate da complicatii cardiovasculare ireversibile;
- Utilizare aspirinei inainte de efort ar putea avea efect benefic, ca inhibitor al cyclooxygenasei (cox), in scopul evitarii formarii trombului plachetar; atentie la sportivul cu predispozitie genetica la formarea de trombi;
- Evitarea unei pozitii corporale prelungite si nefiziologice, care modifica anatomia vasculara sau creste presiunea asupra vaselor;
- Recunoasterea prompta a primelor semne de suferinta vasculara si repermeabilizarea cat mai rapida a vaselor in scopul evitarii efectelor ireversibile.

The recent increase in sporting activity and associated training has resulted in an increase in the number of patients presenting with vascular problems [1-9].

Vascular disease that appears in aerobic activity, can be masked by neuromusculoskeletal pathology and could irreversibly compromise both the vascular hemodynamically and the athlete's career. A variety of syndromes has been described in athletes after arterial or venous injury, during certain sporting activities. Possible *arterial disorders* are: rupture, aneurysm, stenosis and occlusion, while venous disorders are: superficial and deep vein thrombosis (Deep venous thrombosis-DVP), with serious consequences (pulmonary embolism), [10].

**The mechanisms responsible** for development of *arterial* disease are varied: traumatic, ischaemic, prolonged modified body position, arterial compression by the hypertrophied muscle, high pressure within the calf compartment, repeated ruptures of the muscular fasciae [11].

*Venous* disease are produced mostly by blood clot, called a *thrombus*, that can cause problems (in the large vein of the leg-DVP) in endurance athletes. In deep vein thrombosis there are three risk factors involved (The Virchow's Triad): *vascular damage*, *anormal blood flow* and *chemical blood changes*. The vascular damage is caused by the increased blood flow and blood pressure through a vessel, by the oxidative damage and other stresses placed on the vessel lining. If at the above one adds the doping effect, the risk of vascular disease through thrombosis increases mostly by increased blood viscosity up to 25-30 %, especially in cyclists and long-distance runners.

#### **Upper limb arterial disorders**

*Subclavian artery* damage is rare, yet subclavian artery thrombosis or aneurysm formation can occur. Subclavian vein thrombosis is probably the most common vascular problem occurring in athletes. All athletes with ischaemic symptoms have duplex evidence of actual compression during hyperabduction-hyperextension of the shoulder. However, subclavian artery is most commonly

caused by scalene muscles or by cervical rib. *Axillary artery* occlusion and axillary artery aneurysm may result from repetitive trauma between axillary artery and pectoralis minor muscle, from extreme external rotation and abduction of the shoulder in baseball pitchers, volleyball players and windsurfer. Another possibility of injury to axillary vessel is damage from bony contact.

Also, athletes are exposed to high-impact trauma to the hand. Touring cyclists, cricketers, baseball catchers and handball players are susceptible to palmar arch (digital arteries) injury causing thrombosis or aneurysm. Doppler ultrasonography and arteriography may demonstrate arterial occlusion or aneurysm in the axillary or digital arteries [11].

#### **Lower limb arterial disorders**

*External iliac artery* can be affected in competitive cyclists who cover 8000-25 000 km in training each year and similar problems have been reported in marathon runners and rugby players. The mechanism responsible for development of asymmetrical intimal thickening or stenosis of the external iliac artery can be that competition cyclists adopt an aerodynamic position in which the thigh is strongly flexed and the external artery is under considerable tension. When the external iliac artery is occluded, Doppler ultrasonography and arteriography may demonstrate arterial occlusion (Fig. 1). Treatment consists in endarterectomy or in bypass (a vein bypass from the common iliac artery to the common femoral).



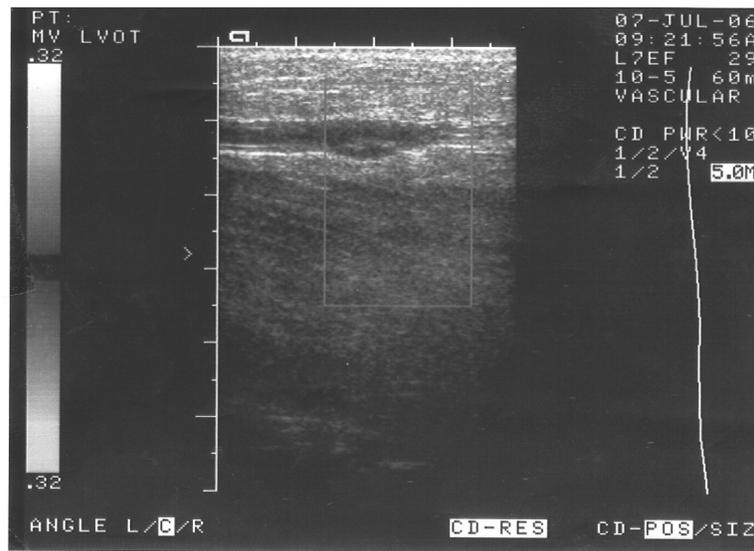
**Fig. 1.** Left external iliac artery occluded (competitive cyclist, adopt an aerodynamic position in which the thigh is strongly flexed and the external iliac artery is under considerable tension).

Stenosis or occlusion of *superficial femoral artery* in the adductor canal is thought to be due to compression by the hypertrophied adductor magnus and vastus medialis, and has been reported in skiers and runners. Popliteal artery normally situated may be compressed by muscular hypertrophy of the gastrocnemius muscle but also sometimes by soleus and plantaris [12, 13].

Clinically, the onset of the symptoms is abrupt consisting in: severe pain (possibly severe claudication or intermittent claudication during exercise), changes in colour and temperature of the limb, with abnormal Doppler waveforms. Acute occlusion may require urgent revascularization.

The confirmation of the vascular disease (occlusion or luminal stenosis) is possible through: Doppler ultrasonography, computerized tomography, conventional arteriography or digital subtraction arteriography [14-22].

Doppler technique (noninvasive procedure) is used to measure and assess the flow of blood, through the blood vessels and can indicate a blockage caused by a blood clot, a plaque or inflammation. The saphenous vein has superficial position and in many cases it can present small nonocclusive thrombi (venous thrombosis), to competitive runner (Fig. 2), [23-26].



**Fig. 2.** Internal saphena vein thrombosis (competitive runner).

**The primary prevention** of these events is made through:

- Informing the athlete about the vascular risk, generated during sport;
- Sufficient hydration of the athlete during the effort, to maintain the blood homeostasis;
- Eviction of the doping substances since their effect added to the blood chemistry changes might induce irreversible cardiovascular lesions;
- Use of aspirin prior the effort might be of benefic through the inhibition of the cyclooxygenase (cox); attention must be paid at athletes genetically predisposed to thromb;
- Avoidance of prolonged, unnatural body posture which increases the pressure on the vessel;
- Early recognition of the vascular disease and early reperfusion to avoid irreversible changes.

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## PHYSICAL EXERCISE –AN ACTIVE FACTOR IN PREVENTING CORONARY HEART DISEASE

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**REZUMAT. Activitatea fizică de timp liber, factor activ în prevenirea bolilor coronariene.** Această lucrare este un studiu preliminar din cadrul unui grant care are ca scop creșterea numărului de practicanți ai exercițiilor fizice în populația adultă cu risc cardiovascular. Activitatea fizică de plăcere, fitnessul și exercițiile fizice sunt factori foarte importanți pentru sănătatea și starea de bine a persoanelor de toate vârstele. Cercetarea a arătat că aproape toți oamenii pot beneficia de pe urma practicării în mod regulat a exercițiilor fizice, fie ele foarte solicitante sau moderate. Scopul acestei lucrări este de a justifica și concepe un cadru, atât teoretic cât și practic, care este necesar în mod evident pentru promovarea programelor de sănătate în cadrul diferitelor categorii de populație pentru prevenirea bolilor cardiovasculare.

### INTRODUCTION

**This paper is a preliminary study within a research grant aiming enhancing exercise participation rates, in potentially cardiovascular challenged adult population.** Regular leisure physical activity, fitness, and exercise are critically important factors for the health and well being of people of all ages. Research has shown that virtually all individuals can benefit from regular physical activity, whether they participate in vigorous exercise or some type of moderate health-enhancing physical activity.

The purpose of this intervention is to justify and conceive an articulate frame, both theoretical and practical, clearly needed for health promotion programs within different types of population, in order to prevent cardiovascular disease. There is evidence that in Romania morbidity and mortality from illnesses whose causes are directly linked to lifestyle are quite high and coronary heart diseases and strokes claim more lives than any other diseases. Lack of physical activity is now considered a risk factor for cardiovascular disease. Only 10% of Romanians involve themselves in physical activities-vigorous physical activity for 20 minutes at least 3 times a week (vigorous physical activity as defined by greater than 50% of maximum cardiorespiratory capacity for 20 minutes at least three times per week). Approximately 20% of deaths per year are felt to be directly associated with inactivity.

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The need to modify the lifestyle of Romanian adults will have to stimulate the development and implementation of a national campaign, whose main scientific and methodological traits will have to be thoroughly identified and conducted. As people and their health behaviors are product of their families, schools, places of work etc, an educational approach would be more than appropriate, starting with determining the community's health behavior patterns. Successful implementation of such health intervention campaign aimed at heart disease prevention require prior analysis and understanding of community structure, individual motivation patterns, health-related issues, medical history, professional background, physical/sports experience etc. Also, major and minor risk factors will have to be identified, so that adequate individualized physical combined routines and exercises will have to be conceived.

To conclude, we clearly know that exercise can significantly improve health. Now it is time for all of us to start putting into practice this knowledge.

## CONTENT

**Cardio-vascular pathology** includes: coronary disease, arterial hypertension, cerebral vascular accident, cardiac insufficiency, valvulopathies, heart malformations.

The *coronary disease* settles with the ageing process, when the vascular caliber tends to diminish because of the forming, at the level of vessel internal wall, of the atheroma plaques. Lumen narrowing proportionally leads to the reducing of circulation speed at the coronary level, so that pectoral angina crises can occur.

The *arterial hypertension* represents the increase of arterial tension values beyond the normal limits corresponding to age and somatotype. Under these conditions, there is a high risk of cerebral, cardiac and renal complications. To establish the limit between normal and pathological values, there were made important epidemiological studies including thousands of subjects, by the Health World Organization and by the Joined National Committee for Detecting, Evaluating and Treating the AHT in the USA.

**Classification of arterial hypertension in persons over 18 years old, according to the latest JNC report published in 1998**

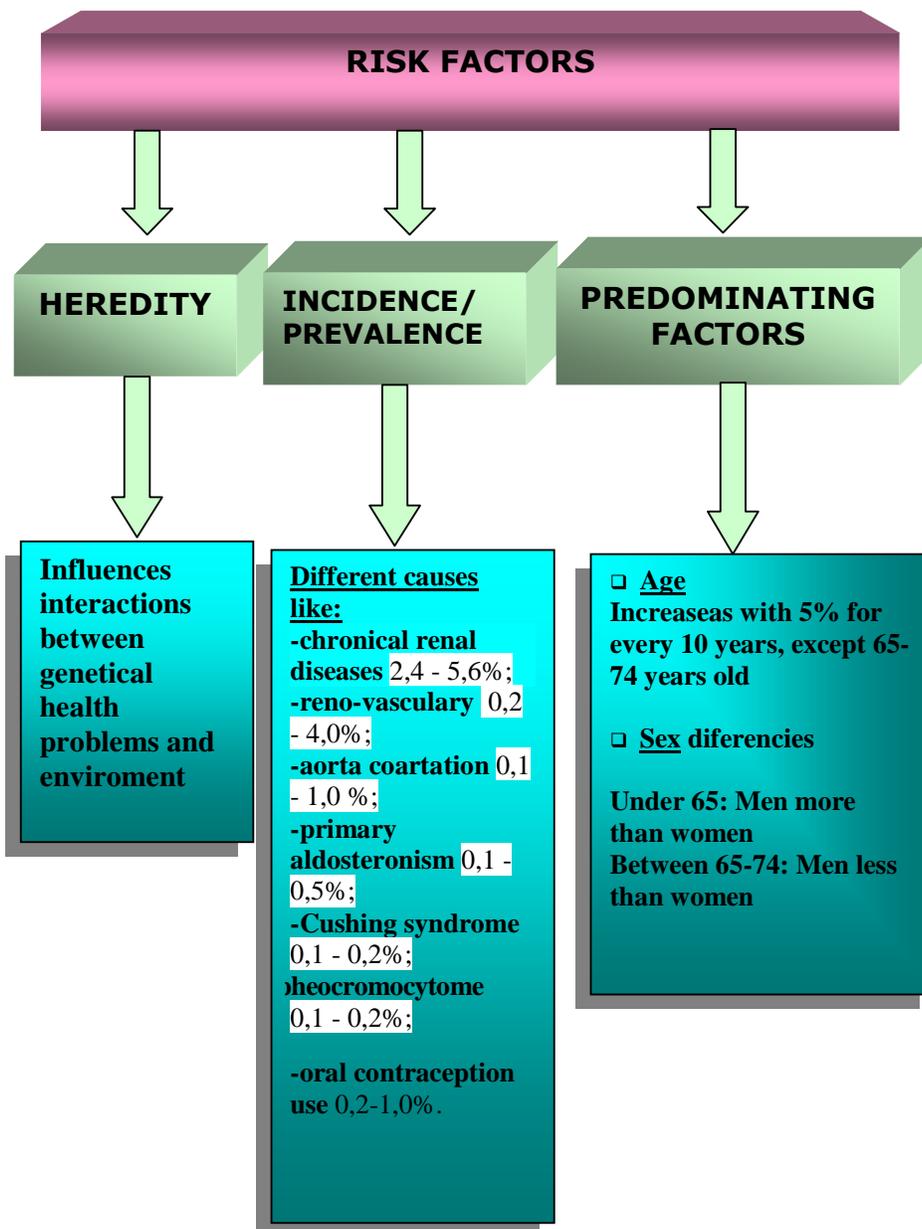
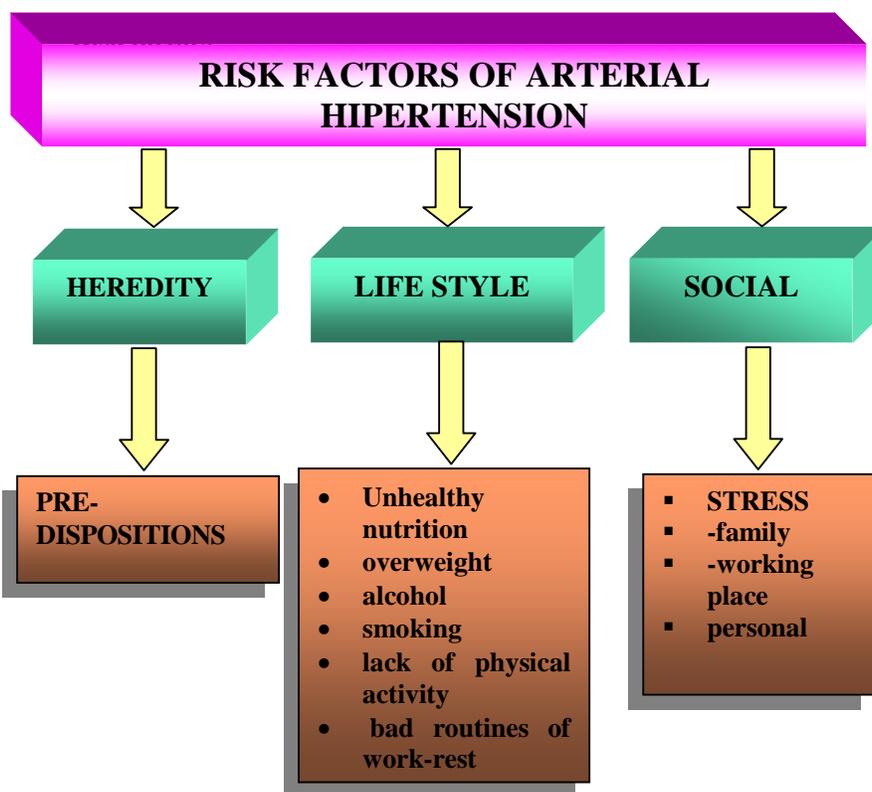


Fig. 1  
Schema nr. 1

CATEGORY	SYSTOLIC (mmHg)	DYASTOLIC (mmHg)
OPTIMĂL	<120	<80
NORMAL	<130	<85
NORMAL - INCREASED	130-139	85-89
HYPERTENSION Gr.1 ("small")	140-159	90-99
HYPERTENSION Gr.2 ("moderate")	160-179	100-109
HYPERTENSION Gr.3 ("severe")	□ 180	□ 110

**Risk factors leading to cardio-vascular diseases**

**CARDIOVASCULAR DISEASES APPEARANCE**



Schema nr. 2

**Relationship between the risk factors and the relative probability to develop coronary disease**

Risk factors	Very low	Low	Moderate	High	Very high
TAS (mm col Hg)	under 110	120	130-140	150-160	over 170
TAD (mm col Hg)	70	76	82-88	94-100	105
CIGARETTES (number a day)	none	5	10-20	30-40	over 50
Cholest. tot/HDL	under 3	under 4	under 4,5	under 5	over 7
Triglyc. (mg/dl)	Sub 50	Sub100	130	200	over 300
Glucose( mg/dl)	Sub 80	90	100-110	120-130	over 140
% Fat tissue men	12	16	25	30	over 35
% Fat tissue women	16	20	30	35	over 40
Body mass index	under 25	25-30	30-40	over 40	?
Stress level	None	neglectable	rare	frequent	almost permanent
EEG anom. (depression ST mv )	0	0	0,05	0,10	0,20
Family anteced. of premature heart failure	0	0	1	2	3
Age	under 30	40	50	60	over 70
Physical activity (min/week) Over 6kcal/min 5MET	240	180-120	100	80-60	Sub 30
Physical activity (min/wek) Over 60% max HR	120	90	30	0	0

HDL = lipoproteins with great density, favoring the regression of atheroma plaques

1 MET corresponds to the oxygen consumption at rest 3.5 ml/kg/ min or 1.2 kcal/min

max HR = theoretical maximal heart rate (220 – age in athletes, 200 – age in non-athletes)

Premature heart failure = under 60 years old

### **Cardio-vascular complications associated to AHT – risk factors**

Smoking, dyslipidemia, sugar diabetes, age over 60, male gender, post-menopausis period, heredo-colatral antecedents of cardio-vascular diseases in women under 65 and in men under 55, associated cardio-vascular conditions (left ventricular hypertrophy, supported pectoral angina and myocardic infraction, circulatory insufficiency, supported coronary revascularization, transitory supported cerebral ictus, nephropathy, retinopathy, peripheral artery diseases).

### **Stress and arterial hypertension**

#### ***Psycho-neuro-cardiology:***



### **Spectral analysis during 5 minutes of the heart rate variability in a tired and tensed manager:**

The stress effect at the work place on the arterial tension is specified in the Decision of the Ministry of Health and Family no. 803 – Nov. 1991:

PHYSICAL EXERCISE –AN ACTIVE FACTOR IN PREVENTING CORONARY HEART DISEASE

<ul style="list-style-type: none"> <li>▪ The Sympathetic Autonomous Nervous System (Frequency Spectre 0,04-0,08 Hz ) is Activated at Maximal Value and thus he is Exposed to the Risk of Instability and Premature Exhaustion of the Cardio-vascular System because of the AHT and, on the lond term, because of the Metabolic Syndrome occurring.</li> </ul>
<ul style="list-style-type: none"> <li>▪ The Parasympathetic Autonomous Nervous System (Frequency Spectre 0,15-0,40 Hz) is Activated, the Person needing Sleep for the Recovery, but he can't Sleep because of the Maximal Sympathetic Activation.</li> </ul>
<ul style="list-style-type: none"> <li>▪ There is an obvious Lack of Balance between the 2 ANS Branches, as the Cardiac-respiratory Coherence is Minimum (Frequency 0,12 Hz).</li> </ul>
<ul style="list-style-type: none"> <li>▪ Access to Intuition is Blocked and the Concrete (Intellectual) Processes are Slow and Confused because of the Cortical Inhibiting induced by the Strong Sympathetic Activation.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Interhuman Communication is Disturbed on both Senses:                             <ul style="list-style-type: none"> <li>○ Difficult Expression of the Ideas;</li> <li>○ Superficial and Confused Information Processing.</li> </ul> </li> </ul>

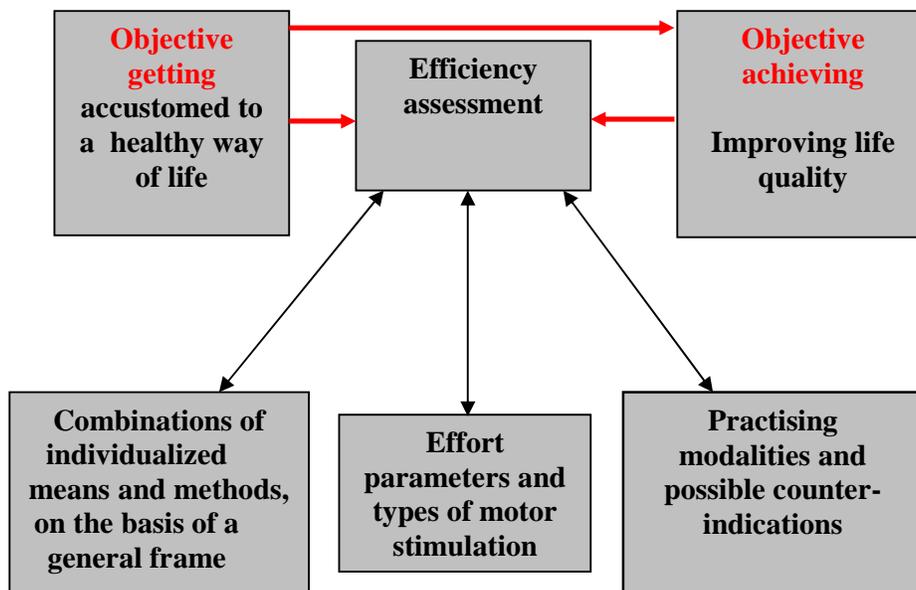
INDICATORS (PARAMETERS)	NON-SPECIFIC VALUES	OBSERVATIONS
PHYSIOLOGICAL INDICATORS		
Modifications of arterial tension	The increase of systolic and/ or dyastolic tension with more than 10 mmHg during the activity, as compared to the mean values on the monitorized period or to the reference values	Stress reaction determined by the cognitive (mental) strain and/ or cumulation of noxious factors (stress and neuro-psychical overstrain, noise, unfavorable microclimate)
	The increase of systolic and/ or dyastolic tension with more than 40 mmHg during the activity, as compared to the mean values on the monitorized period or to the reference values	Stress reaction determined by the cognitive (mental-emotional) strain during the work processes involving a temporal constraint, with uncontrollable factors and public relation activity

**"Movement is life"** says a maxim with a millenary history, because there is no biological function, no system or organ that shouldn't be positively influenced by movement from the first to the last moment of life.

Physical activity has got its well-determined role and place in the prophylaxis of cardio-vascular diseases due to the numerous researches about the influence of this parameter, that included: epidemiological data; the study of physiological adaptations induced in athletes by the training and susceptible to diminish the risk of cardio-vascular diseases; the study of the relationship between risk factors and training. Among the risk factors above-mentioned, we shall approach physical inactivity which represents a primary major risk for both affections.

The term of **physical inactivity** was added on the list of risk factors in the HWO report of July 1992, that's why the specialty literature was relatively poor as for the arguments in favor of the beneficial effects of physical exercise in the prophylaxis and therapy of cardio-vascular diseases. Physical inactivity in adults is frequently associated to obesity, dyslipidemia, atherosclerosis, hypertension, by existing maximal chances for the producing of a coronary or cerebro-vascular accident, as well as of different invalidating diseases.

### Strategic landmarks in the research approach



### **Design for the strategy applying**

1. medical examination before the beginning of the training program, in order to exclude an unknown heart disease;
2. program periodicity;
3. program content and work-out intensity, according to individual differences;
4. effort level evaluated on the basis of clinical screening data;
5. favorable environment.

### **System of exercises**

**Aerobic exercises** stimulate cardiac function, increase oxygen uptake and prevent some chronic diseases.

### **Body response to aerobic exercise**

- • oxygen uptake is higher than usually;
- • breathing is faster and deeper to allow the oxygen to penetrate into the blood;
- • blood circulates faster and more intense;
- • heart beats faster in order to produce energy and to distribute oxygen as efficiently as possible;
- • each beat of the heart is more powerful, in order to increase blood irrigation towards the muscles and back to the lungs;
- • capillaries will develop in the profound muscle tissue; the diameter of capillaries and their number increase, by transporting more accumulated waste products (CO<sub>2</sub> and lactic acid);
- • loss of water and of minerals needs a corresponding hydration;
- • brain endorphine secretion is stimulated, they contributing to stress release, to a better state of mind and to a better immune response.

### **Beneficial aspects**

Administered, individualized and monitorized physical practice contributes to:

- reducing the risk of coronary disease occurrence and preventing a heart failure;
- reducing the risk of arterial hypertension and maintaining the pressure within normal limits;
- improving the proportion of fats in the blood, by lowering the cholesterol level;
- lowering the risk of a stroke;
- maintaining a body weight as close as possible to the ideal values or reducing obesity.

### **Conclusions**

A constant level of physical activity positively influences at least two of the major risk factors (dyslipidemia and arterial hypertension) in atherosclerosis and its complications.

As a consequence, the practise of some aerobic exercises at an effort level evaluated on clinical data and on effort tests represents a beneficial modality in primary and secondary ischemic cardiopathy prevention.

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## PREPARATION TECHNIQUE ET TACTIQUE DANS LE BIATHLON DE HAUT NIVEAU

ȘTEFANESCU HOREA<sup>1</sup>

**REZUMAT.** Pregătirea tehnico-tactică în biatlonul de performanță. Teoria și practica au impus o creștere permanentă a încărcăturii în perioada de pregătire, pentru a atinge punctul de vârf în ultimele două săptămâni ale perioadei. În perioada de concurs, pe baza nivelului existent al rezistenței aerobe (baza necesară pentru posibilitățile maxime ale rezistenței anaerobe), trebuie să scadă încărcătura. Ritmul se caracterizează printr-o scădere și creștere ondulatorie a încărcăturii: după fiecare două săptămâni de încărcare, urmează un ciclu de una sau două săptămâni de descreștere a încărcăturii. Aceste cicluri exprimă cele mai caracteristice ritmuri de încărcare în perioada de concurs, care este în dependență de cerințele concrete ale calendarului sportiv și a formei sportive. Macro ciclul în care sunt incluse ciclurile periodice (mezociclurile și microciclurile) reprezintă un ritm individual al încărcăturii fizice, fiziologice și psihice. În fond, acest ritm stabilește realizarea optimului în întreaga dezvoltare fiziologică, tehnică și psihică a sportivului. Legile biologice și legitățile funcționale cărora li se subordonează funcțiile de bază ale organismului uman sunt aceleași și definesc ceea ce este esențial, fără însă a subestima deosebirile individuale care pot să completeze cel mai bine lucrul pe care îl dorim cu toții, adică optimul pentru un anumit sportiv. Cerințele practice și științifice demonstrează că prin aplicarea unui asemenea ritm de încărcare, se obțin cele mai bune rezultate de abia în săptămâna a patra din ciclu, sau în prima săptămână a ciclului următor. Iată de ce, planificarea antrenamentelor trebuie să se facă în așa fel încât, concursurile cele mai importante să coincidă ca timp cu săptămâna a patra din ciclu, sau prima săptămână din ciclul următor. În cazul când concursurile sunt concentrate în lunile ianuarie-februarie, există și alte variante ale aceluiași principiu de coborâre sau ridicare a nivelului încărcăturii cu 15-20%. Începând cu luna ianuarie, se impune o aplicare creatoare a acestor variante privind încărcătura pentru antrenament, care trebuie să țină seama de condițiile concrete, cât și de cerințele calendarului sportiv. Incluziunea microciclurilor pentru ridicarea nivelului de rezistență generală în scopul stabilizării funcționale și psihice schimbă ritmul, atât în ce privește intensitatea și volumul, cât și creșterea sau scăderea încărcăturii în cadrul mezociclului. Incluziunea unor microcicluri din perioada de pregătire sunt uneori necesare. Trecerea din nou la activitatea de pregătire specială pentru un anumit concurs, impune o nouă întoarcere la cicluri care au caracterul și sarcinile activității de concurs, adică munca de pregătire pentru concursul de obiectiv. Diferențele individuale care există între sportivi, duc la obținerea de rezultate diferite. Aspecte menționate aici confirmă faptul că, deși sunt aplicate aceleași forme de antrenament și încărcătură, sportivii pot obține rezultate diferite.

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Les procedes techniques de biathlon ne sont pas tres nombreux et ils sont representes par des mouvements cycliques, donc une fois appropries ils ne constituent pas un facteur limitateur extreme pour obtenir la performance.

En ce qui concerne le travail pour la technique on suivit autant le perfectionnement des procedes de deplacement que le tirage avec balle pour les deux positions.

La preparation technique des sportifs de groupes de haut niveau englobe 15% de nombre total de km parcours sur neige et sur les ski au roller. Dans le cadre de ces deux composants de l'entrainement on suivi le perfectionnement des elements et des procedes techniques desquels les sportifs ont besoin pendant les competitions.

Certains elements de la preparation technique –l'equilibre, le glissement sur les ski, la manoeuvre du fusil en polygone-ont un caracter general et d'autres doivent etre perfectionnes jusqu'au niveau de maitrise.

Le perfectionnement de la technique specifique ne peut pas etre realise si on ne respecte pas les demandes suivantes:

- l'adaptation de la technique aux particularites individuelles

- le perfectinnement de la technique aux conditions pareils a celles de concours

Parallelement avec le perfectionnement de la technique est aussi la preparation tactique qui vise:

- l'abordage des procedes de deplacement sur les ski en fonction de la configuration du terrain et l'etat de la neige

- le dosage correcte de l'effort tout au parcours des distances de l'entrainement de nouvelles competitions

- l'abordage tactique de la realisation des tirages en polygone en fonction de la preparation que le sportif en a et aussi en fonction de la longueur de l'epreuve.

## **PREPARATION PSYCHOLOGIQUE**

Les epreuves de biathlon supposent des demandes speciales pour la preparation psychologique des sportifs. Elles sollicitent une grande volonte et une tres grande motivation a cause de l'intensite des efforts tout au long des entrainements et des competitions. Les plus importantes qualites de volonte sollicites sont: l'effort constant vers un but; la perseverence, la decision; le courage et la discipline.

L'education de la volonte se fait tout au long de la preparation. Selon Epuran M. Les methodes les plus utilises sont:

- l'introduction dans l'entrainement, systematiquement des certaines difficultes de degre et contenu different, pour creer aux sportifs la capacite d'aotudepassement

- le dasage graduel des efforts pendant les entrainements

- etablir des demandes precises a l'egard de la maniere d'accomplir les obligations soit a l'entrainement soit au concours. On demandera au sportif des executions correctes et on lui interdira l'abandon ou la reduction du nombre des repetitions;

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- la participation aux concours les plus nombreux possible
- l'utilisation de toutes les situations et les conditions qui contribuent directement ou indirectement a l'education de la volonte;
- respecter le regime de travail et de repos
- respecter les regles de comportement
- la ponctualite et l'accomplissement des obligations professionnelles et sportives
- etablir des certains criteres consequants d'appréciation des activites sportives
- l'assurance de la participation consciente du sportif au travail d'education de sa propre volonte par:

- La connaissance des obligations qu'il doit les accomplir dans un futur proche ou eloigne
- Le developpement de la confiance dans ses propres forces, de sa capacite de dominer ses eventuelles emotions negatives;
- Le developpement du desir du sportif de s'auto perfectionner, de parfaire ses traits positifs, de developper ses traits faibles et d'ecarter ses traits negatifs
- l'assurance de l'appui collectif pour stimuler l'activite du sportif par des analyses periodiques de son activite par l'appréciation du programme realise mais aussi pour etablir les obligations de l'etape a suivre

### PREPARATION THEORIQUE

Cette preparation a comme principale tache la transmission des connaissances aux sportifs sur les sollicitations qui impliquent ces preuves de biathlon, sur les connaissances de la fiziologie et la biochimie de l'entrainement qui puissent favoriser la conscience des certaines exercices et la necessite de respecter un regime correcte de travail et repos. Les objectifs de cette preparation sont la connaissance et le respect des regles d'utilisation des fusils et aussi du reglement du concours.

### LA STRUCTURE DE L'ENTRAINEMENT

#### *La structure des cycles journaliers de l'entrainement*

Le rythme de l'effort dans l'entrainement inclue des entrainements decomposes en deux, en trois ou en quatre parties, alternes selon le principe de la rhythmicite.

#### *L'entrainement en deux parties:*

- Avant midi-de base; Apres midi-celui complementaire
- Avant midi -d'accumulation; Apres-midi-de base
- Avant midi'1/2 du volume de l'entrainement de courir et l'apres midi l'autre demie

#### *L'entrainement en trois parties:*

- Le matin=entrainement d'accumulation et de compensation; avant midi-special; l'apres-midi de preparation de base;

- Le matin=entraînement d'accumulation et de compensation, avant midi-entraînement special et l'après-midi entraînement compensateur;
- Le matin =l'entraînement d'accumulation, avant midi – entraînement technique; l'après-midi-entraînement special ou de base

*L'entraînement en quatre parties*

- Le matin-entraînement d'accumulation, avant midi-special 1 ou spécifique; après-midi=entraînement special 2 et le soir=entraînement compensateur de preparation physique generale

Il est important de savoir qu'on peut diviser la periode d'entraînement ayant toujours en vue la capacite de l'organisme de s'adapter a l'effort et de se refaire. Il est bien a mentionner que les sportifs entrainnes de cette maniere (6 h par jours)obtiennent de bons resultats et refaite incomplete.

### **LA STRUCTURE DE MYCROCYCLES**

La necessite des modifications periodiques du travail, en vue de realisation de certaines taches d'entraînement peut etre exemplifie premierement, par l'achevement d'un calendrier competitionnel et des variations des conditions climatiques specifiques aux sports d'hiver, dans notre cas le biathlon.

Sans sousapprecier la valeur des facteurs objectifs externes, le systeme entier de diviser la preparation est soubordonnee finalement au objectif principal et a l'atteinte d'une forme sportive au moment donne optimale et aussi a la maintenance aux intervalles precises pour obtenir la performance planifiee. Le contenu des entrainements depend de differents facteurs et dans la plupart des cas, dans un seul entraînement on ne peut pas atteindre plusieurs objectifs. Et il n'en faut pas. Pour cela, en vue d'atteindre l'effect planifie deja de l'entraînement, il est necessaire qu'on prenne en consideration un nombre plus grand d'unite d'entraînement enchainees dans une ordre qui se veut le plus precise etablie dans une certaine unite de temps. Cette unite de temps avec un caractere operatif, qui peut nous orienter a diriger les effets cumulatifs d'une serie d'entrainements. est d'habitude le microcycle qui peut etre aussi de deux fois par semaine.

Une constatation pratique, expliquee scientifiquement soutient que les entrainements avec un caractere unitaire sont plus efficaces que ceux avec un caractere complexe. En biathlon les lecons complexes ont des qualites speciales, par exemple *courir a sec sur les ski en supposant effort*. C'est-a dire eviter la monotonie, repos actif, action differenciee avec un effet compensateur ou multilateral.

Le rapport optimale entre les entrainements unitaires et ceux complexes depend premierement des particularites du biathlon ou les entrainements complexes de courir et de tirage avec le fusil represente un element prioritaire autant plus important que les resultats des deux composantes du biathlon ont une importance egale et par leur caractere diferencie des sollicitations pretendent une parfaite et tres attentive harmonie.

En revenant a la structure du microcycle: il peut etre forme par deux phases de stimulation des effets, chacun compose de deux ou trois entrainements, en alternant avec un ou deux entrainements de refaite et fini avec une phase de repos actif ou pasif (6-10 entrainements en 2-3 jours)

### **LA STRUCTURE DU MACROCYCLE**

Le macrocycle definit le rythme de developement des qualites de base avec le but d'arriver aux resultats optimes dans l'entrainement et des realisations maximales en concours. Les entrainements sont structures en periodes de base (preparation et concours)et une de reetablissement actif (de transition) dans un rythme specifique qui se realise dans les directions suivantes:

#### *La periode de preparation:*

- L'accroissement graduel du volum et de l'intensite;
- Le developement des possibilites aerobes aux limites du niveau optimal
- L'accroissement des moyens generales de preparation et d'entrainement
- L'accroissement graduel des moyens speciales de preparation et d'entrainement
- L'obtention d'un haut niveau du consum maxim d'oxygene
- La recommandation d'adapter les skis et la neige aux conditions specifiques

#### *La periode de concours:*

- L'accroissement graduel de l'intensite et la reduction aux limites necessaires du volum
- L'accroissement des moyens speciales de preparation et d'entrainement
- L'atteinte de plus haut niveau du consum d'oxygene
- Le developement des possibilites anaerobes
- Le perfectionnement de la technique et la tactique de concours

#### *La periode de transition:*

- Le reetablissement physique et psychologique
- La reduction de l'effort
- L'entrainement de transition \_cycle de deux semaines avec la refaite des moyens de base de l'entrainement, en vue d'inclure des exercices que puisse apporter la consolidation de l'activite des musculaire par les nouveaux moyens d'entrainement

### **LA DYNAMIQUE DE L'EFFORT PENDANT LA PERIODE DE PREPARATION, DE CONCOURS ET DE TRANSITION**

La théorie et la pratique ont imposé un accroissement permanent de l'effort pendant la période de préparation, pour atteindre le point maximum dans les deux dernières semaines de cette période. Dans la période de concours, sur la base du niveau existant de la résistance aérobie il faut réduire l'effort. Le rythme se caractérise par une réduction et un accroissement ondulatoire de l'effort: après chaque deuxième semaine d'accroissement suit un cycle de réduction toujours pendant deux semaines. Ces cycles expriment les plus caractéristiques rythmes d'effort pendant la période de concours qui est en dépendance des demandes concrètes du calendrier sportif et de la forme sportive.

Au fond ce rythme établit la réalisation de l'optimum pendant l'entier développement physiologique, technique et psychologique du sportif. Les lois biologiques et celles de la fonctionnalité auxquelles on subordonne les fonctions de base de l'organisme humain, sont les mêmes et elles définissent ce qui est l'essentiel sans sous-estimer les différences individuelles qui peuvent compléter le mieux une chose que tous désirons: l'optimum pour certains sportifs.

### **LA DYNAMIQUE DE L'EFFORT AU CYCLE OLYMPIQUE**

Les recherches effectuées aux disciplines sportives de résistance, comme l'athlétisme, la natation, qui ont des distances qui puissent être vérifiées exactement, indiquent un accroissement des résultats dans l'année olympique et une réduction l'année suivante. Cette loi résulte d'abord du changement de corrélation entre les moyens généraux et spéciaux de préparation et après les changements survenus entre volume et intensité. Une caractéristique pour la dynamique de l'entraînement des sportifs qui se préparent pour les Jeux Olympiques est l'augmentation du volume de course avec l'augmentation des moyens généraux de préparation en premier cycle de l'année olympique. Dans la deuxième année on observe une maintenance du volume et une augmentation de l'intensité des efforts de course et des moyens spéciaux de préparation. Cela crée les prémisses d'obtenir les résultats. Dans la troisième année du cycle on remarque la programmation de l'effort le plus grand sur ce volume de course. L'année olympique demande une réduction du volume en faveur de l'augmentation des moyens spéciaux et spécifiques de l'entraînement et de l'intensité.

### **LA DYNAMIQUE DE PREPARATION POUR LE CONCOURS**

L'organisation de la préparation pour le concours avec objectif est un problème lié de l'obtention des étapes hautes de la supercompensation et cela dépend du caractère des moyens de décompression, du degré de chargement de l'organisme de la durée individuelle nécessaire pour cette période de décompression et elle est liée de l'alternance de la sollicitation avec le repos.

En general on recommande:

- Dans le cas d'un grand concours il est necessaire une reduction dans un cycle d'entrainement de 10-14 jours;
- Pour d'autre concours sans une importance speciale on peut changer seulement les moyens d'entrainement; avec un jour en avant du concours on peut fair une course legere et prolongee
- La plus favorable situation s'obtient par la reduction de l'intensite ce qui fait que l'organisme soit prepare
- Dans tous les cas on ajoute une diete alimentaire correspondante au but envisage

Une importance speciale a la reduction de l'entrainement avec quelques jours avant le concours et l'assurance d'un regime alimentaire riche en hydrates de charbon.

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ȘTEFANESCU HOREA

## THE IMPORTANCE OF PHYSICAL THERAPY IN OPERATED LUMBAR DISK HERNIA

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### **REZUMAT. Importanța kinetoterapiei în hernia de disc lombară operată.**

Hernia de disc lombara cu afectarea rădăcinilor nervoase ale nervului sciatic este destul de frecventă. Prezența în antecedente a unui efort sau a unei lombalgii cronice constituie argumente în favoarea originii discale a sciaticii.

Scopul lucrării de față este acela de a demonstra importanța efectuării programului kinetic de recuperare, care se poate face și ambulatoriu, timp de 10 săptămâni, în perioada 4 – 6 săptămâni post-operator.

Programul kinetic ajută la obținerea unei stări de „bine” datorate îmbunătățirii funcției musculare, articulare și creșterii capacității de muncă.

### **Introduction**

Lumbar disk hernia which affects the roots of sciatic nerve is quite frequent.

Antecedents of an effort or of a cronical lumbag are arguments in favor of a disk origin of the sciatic.

Surgical therapy is suited where the simptomatology is persistent in spite of the treatments made.

### **The objective of the paper**

The goal of the paper is to demonstrate the importance of physical therapy treatment, performed even at home, for a 10 weeks period. In this period, if necessary, the program will be individualized; will suffer changes in structure, load and duration.

Due to this program a state of “wellness” is obtained due to improvement of muscular force, the increase in work ability after the 10 weeks treatment. The physical exercises were simple, easy to perform, useful and varied.

### **Subjects and methods**

The study was made on a group of 10 subjects with the diagnosis of operated lumbar disk hernia, in the second stage of recovery, in Clinical Recovery Hospital, Cluj-Napoca.

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The group of the subjects was composed of 7 men and 3 women with the average age of 40.

The selection of the subjects was made according to the following criteria:

- According to diagnosis;
- According to gender (male, female);
- According to age (young, elder) between 29 and 50 years old;
- According to the symptomatology: pain, motor deficit, low muscular force.

We mention that the patients have as a first diagnosis lumbar disk hernia and a part of them have a secondary diagnosis: coxarthrosis, cervical spondylitis, flat foot, gonarthrosis, and high blood pressure.

For each of the 10 patients a recovery program was conceived, according to the state of the illness. We followed the evolution of the illness and the correctness of the treatment for the whole 10 weeks.

Before establishing the diagnosis of disk hernia the following evaluation:

1. identifying the known causes: ages, gender, factors that favor the illness
2. have been tested: trunk flexion, trunk extension, lateral trunk leaning, lower limb flexion, Schober test, and Lasegue sign.

After the diagnosis the recovery program was established:

- drug therapy;
- physical therapy treatment;

After 10 weeks of treatment a new evaluation was made and the data recorded to evidence the conclusion of the study.

### **Objectives and methods of physical therapy**

1. strengthening the thoracic and lumbar column, of the extensors and abdominals;
2. increasing the mobility of the column;
3. learning a correct posture (acknowledging the lumbar posture)

The recovery program started with duration of 20 minutes with a frequency of 3 to 4 times per week. The patients were under constant supervision to avoid unwanted events. So there were 40 to 50 physical therapy meetings. For each patient a differentiated program was created along with drug therapy.

The physical effort was moderated cardiac frequency being 65% of the maximal cardiac frequency. In time the cardiac frequency got to 85 % from the maximum.

## THE IMPORTANCE OF PHYSICAL THERAPY IN OPERATED LUMBAR DISK HERNIA

All the patients respected the recovery protocols.

The physical kinetic program was composed of:

1. warm up exercises;
2. the training;
3. recovery exercises.

To obtain the objectives, the physical therapy program had exercises for the warm up and respiration, exercises to increase the tonus of the toracal vertebral column flexors and abdominals (the preferred positions were dorsal decubit, ventral decubit and quadrupedy), exercises to increase the mobility of lumbar vertebral column (from dorsal decubit, lateral decubit and quadrupedy).

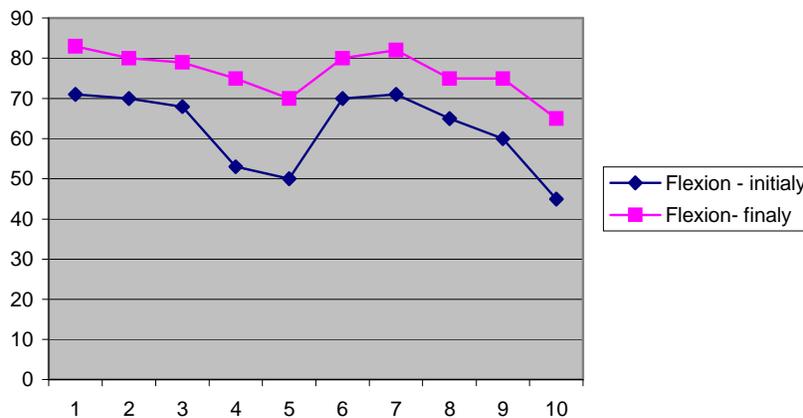
To acknowledge a proper lumbar posture, neutral, regardless of the body position or activities performed the program consisted also from various correcting postures.

### Results and discussions

The values of the six tests were recorded before and after the 10 weeks treatment. The results are presented in the following charts; they prove an improvement of all the calculated values. It is a prove that physical treatment program was successful.

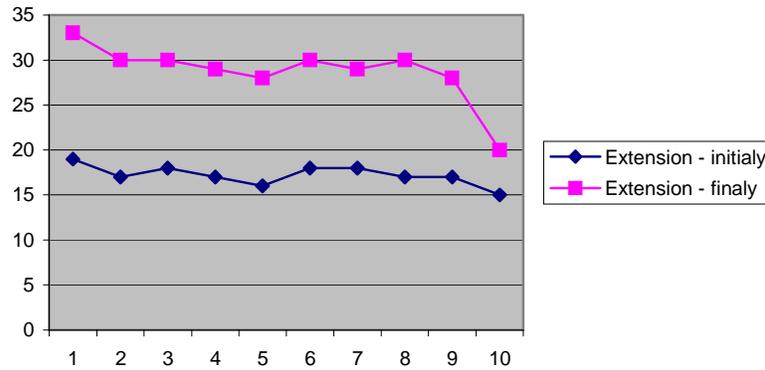
1) For the flexion of the dorso-lumbar flexion from an average of 62,3 the average of final evaluation was 76,3 The improvement was of 14,10

Chart no. 1 Dorso- lumbar vertebral column flexion



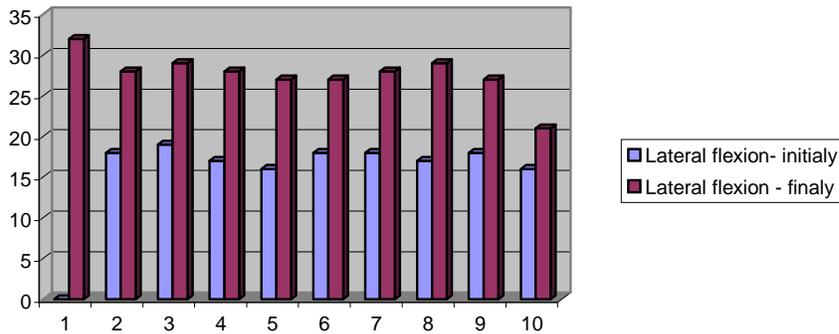
2) For the extension of dorso-lumbar from an average value of 17,2 the final value average value was 28,7 resulting in an increase of 11,5;

**Chart no. 2 Dorso-lumbar vertebral column extension**



3) Lateral flexion of dorso-lumbar column form an average of 17,55 t an improvement of 27,6 resulting in an increase of 10,05

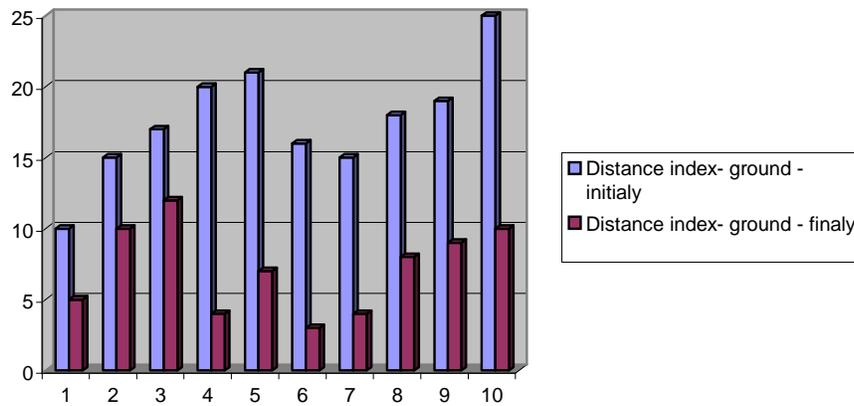
**Chart no. 3.Lateral flexion of dorso-lumbar column**



4) At the test” distance from index t ground” from an average of 17,6 cm the average of final results was 7,2 cm; the improvement was 10,4 cm.

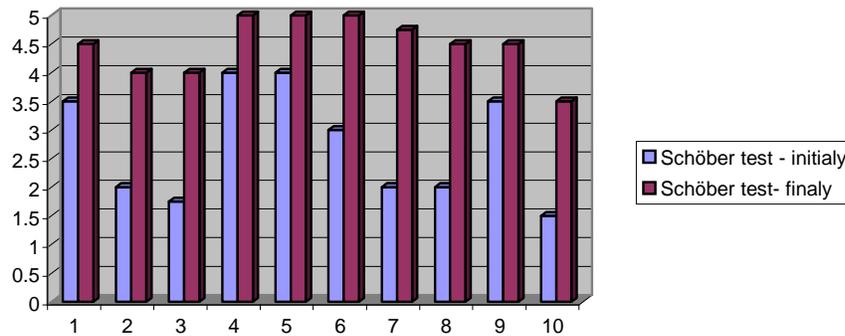
THE IMPORTANCE OF PHYSICAL THERAPY IN OPERATED LUMBAR DISK HERNIA

Chart no.4 Distance index ground



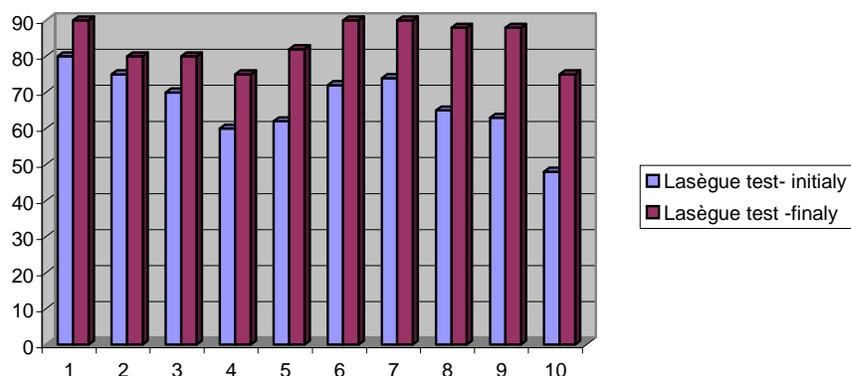
5) The Schober test from an average of 2,72 cm the final average was 4,47 cm, an improvement of 1,75 cm.

Chart no.5 Schober Test



6) Lasegue test. From an average of 66,9 initially the average of final measurements was 83,8 resulting in an improvement of 16,9

Chart no.6 Lasegue test



All ten subjects have shown an improvement in all parameters. The average value improved as follows:

- Dorso-lumbar column flexion improved with 14,10°
- Dorso-lumbar column extension improved with 11,5°
- Lateral flexion of dorso-lumbar column improved with 10,5°
- The average of the distance index ground increased with 10,4 cm;
- The Schober test shown an improvement of 1,75 cm;
- The Lasegue test shows an improvement of the average with 16,9

### Conclusions

During the study and from initial and final evaluations we can conclude:

- A proper physical therapy treatment will help the patient to learn and to acknowledge a correct posture;
- The lumbar mobility increases;
- The lumbar muscular force increases.
- The physical stamina in performing ADLs increases;
- The walking improves;
- The self-confidence is increasing
- Pain and inflammation are eliminated.

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ZAMORA ELENA, CRĂCIUN DAN DRAGOȘ, CIOCOL-POP DUMITRU RAREȘ, BOROS-BALINT IULIANA

## THE STATE OF FITNESS OR DAILY PHYSICAL CONDITION

MAROLICARU MARIANA<sup>1</sup>, MACRA OȘORHEAN MARIA<sup>2</sup>,  
GHERȚOIU DAN MIHAI<sup>1</sup>, BERARU VLAD<sup>1</sup>, MOȘNEAG HOREA<sup>1</sup>

**REZUMAT. Starea de fitness sau condiția fizică.** Starea de fitness se referă la starea omului care are o condiție fizică bună, care practică exerciții fizice și sporturi variate pentru ca să fie în formă, înțelegând prin aceasta că face față cu succes stresului zilnic având o sănătate fizică și psihică foarte bune.

Ne-am pus întrebarea în ce măsură grupuri socio-profesionale variate își dau seama de importanța practicării exercițiilor fizice ca o condiție sine qua non a stării de sănătate. Pentru a răspunde la această întrebare am efectuat o anchetă folosind chestionare și convorbiri personale. Am identificat sălile de fitness din Cluj-Napoca pentru a concluziona dacă există posibilități de practicare a exercițiului fizic.

The state of fitness refers to the state of man who has a good physical condition, who practices various physical exercises and sports to be always in shape, understanding by that that he copes very well with daily stress, having a perfect physical and mental health.

The word fitness refers to the sport defined as “fitness” which means gymnastics for all, composed by many and various physical exercises.

Without a doubt, nowadays, practicing physical exercises by all people is a priority of all countries; this activity has to be promoted among children and young people and not in the last place by the elderly, knowing the physical inactivity is matter of public health.

We can talk of different levels of fitness determined by age, sex, heredity, training or lack of it, state of health etc.

We asked ourselves in which measure various socio-professional groups acknowledge the importance of practicing physical exercises as a sine qua non condition of being healthy. To answer this we made an inquiry using questionnaires and personal interviews and in the same time we identified the gyms from the city of Cluj-Napoca

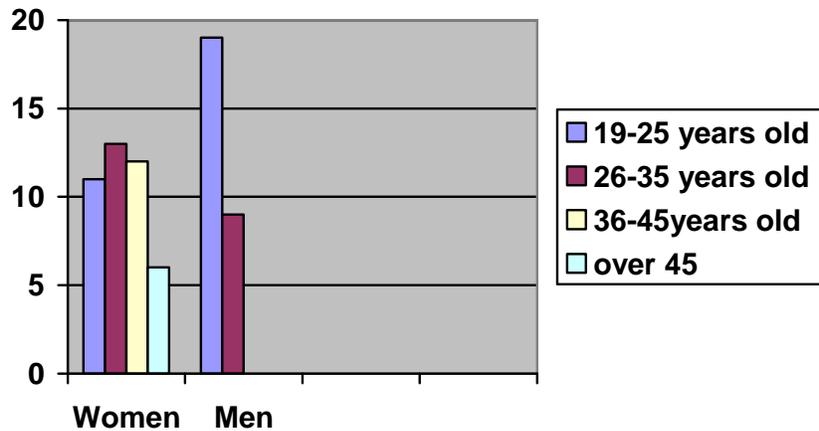
In the inquiry we questioned a number of 60 people, 42 women and 28 men.

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### Gender distribution



The main goal of the women, specially the younger ones, is to lose weight and to have a beautiful body. It is interesting that most of the women do not establish a relationship between the training and physical condition as a result of those trainings. The males, instead, value mainly the physical condition, which most of the subjects think that is represented by big muscles; then they focus on the body harmony because they see a relationship between physical condition and muscle mass as a result of training.

The main reason women frequent gyms is to be fashionable, to socialize, to lose weight and to have a harmonious body. For male the main objective is muscle mass, even if for that they use anabolic substances.

What are the reasons for not going to the gym or practice? Firstly the cost of trainings, the distance between home and gym, lack of time and indolence. Most of the subjects see possible only the training in the gyms and do not take into account the possibility to train in a natural environment which can prove better results. There are a variety of exercises that can be practiced in nature or in open spaces and which give that state of wellness very well described by R. Jeudon as "to feel well in your own body".

From the interviews with fitness trainers results that women, mostly the young ones, are whimsical about the training programs and don't follow instructions regarding the exercises or number of repetitions. Only those who acquire knowledge about physical training and about the role of physical exercise for a good health are willing to train properly. Most of the girls who frequent gyms are very "proud" about it because they are, according to their own statement, fashionable.

#### THE STATE OF FITNESS OR DAILY PHYSICAL CONDITION

Only 15% from the people we interviewed have a training program established in advance, the rest creating their program in the day of the training or they train randomly.

As a conclusion we observed that even going to a gym is mainly related to fashion, this will produce results later because many will feel the need for “movement” and will make others start the trainings.

We think that it is necessary for the instructors to explain more the characteristics of exercises from the programs, to establish relationships between the volume of effort, number of repetitions and duration of breaks so the practitioners acknowledge the scientific background of training programs. They also have to point out the influence of physical exercises over the respiratory and circulatory apparatus and over physical condition.

From this study, and comparing with previous years it can be observed a significant increase in numbers of those include in their life regime practicing physical exercises as an enjoyable and useful pastime.

We think the best physical condition is gained by continuity, perseverance, and natural means and without resorting to any substances.

MAROLICARU MARIANA, MACRA O. MARIA, GHERȚOIU D. MIHAI, BERARU VLAD, MOȘNEAG H.

## TENNIS GAME – BEYOND ENTERTAINMENT

COSMIN MIHAI MOCA<sup>1</sup>

**REZUMAT. Jocul de tenis – mai presus de divertiment.** Începutul în orice domeniu al vieții profesionale, personale sau sociale are în vedere finalitatea și nivelul de reușită în domeniul respectiv. În mod asemănător în jocul de tenis prin finalitate se înțelege câștigarea fiecărui punct ceea ce în final va conduce spre victorie. În cele ce urmează am încercat o prezentare succintă a tenisului profesionist și a celui amator accentuând asemănările și diferențele dintre ele.

Jocul de tenis de tip amator este acel tip de activitate independentă de orice constrângeri și al cărei unic scop este acela de a oferi momente plăcute și de relaxare. Spre deosebire de tenisul profesionist, tenisul pentru amatori are avantajul de a putea fi practicat până la vârste înaintate în concursurile de „old-boys” și nu numai.

Avantajele practicării jocului de tenis sunt evidente la toate etapele biologice ale ființei umane. Dintre acestea menționăm:

- copilul își îmbunătățește sănătatea fizică și psihică
- în stilul de joc al juniorului se pot observa cu ușurință manifestări ale propriei personalități
- tânărul are șansa de a scăpa de surplusul de energie atât de caracteristic vârstei
- adulții își îmbunătățesc pe lângă sănătatea proprie și capacitatea de muncă
- vârsta a treia câștigă respectul și admirația lumii sportive

Ca să rezumăm am putea spune că practicarea oricărui sport înseamnă dincolo de toate o preocupare sănătoasă pentru o viață dinamică.

Este adevărat că tenisul pentru amatori poate părea o naivitate din perspectiva profesionistului.

La polul opus se află tenisul de performanță. Ar trebui să începem prin a încerca să dăm o definiție a performanței. Performanța înseamnă înainte de toate o disciplină superioară de comportament dezvoltată în unități de timp exacte. În al doilea rând performanța înseamnă obținerea de rezultate bune în competiții, înseamnă să fi cel mai bun între cei buni. Menținăm

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aici și super-performața acel amestec de rezultate obținute în diferite întreceri internaționale și valoare sportivă.

Cei care au ales să practice jocul de tenis la un nivel performant pe lângă avantajele menționate anterior mai au și multe alte beneficii cum ar fi:

- ei reușesc să dea o formă materială concretă efortului lor fizic
- își disciplinează modul de viață
- au un stil de viață sănătos
- se obișnuiesc cu lupta sportivă

Beneficiile jucătorului de tenis profesionist sunt imense și ele se pot întâlni la toate nivelele vieții sale sociale și sportive. Din punct de vedere social el câștigă anumite sensibilități; este admirat sau dimpotrivă invidiat de colegi, este protejat sau pedepsit și oarecum se izolează de societatea avidă de distracții și de nopți pierdute preferând micro-societatea sportului.

Dincolo de efortul individual mai este necesar și efort material care nu este deloc de neglijat. Acesta este cu atât mai mare cu cât valoarea jucătorului este mai mare. Din punct de vedere psihologic se poate vorbi și despre anumite schimbări benefice. Calități intelectuale și afective încep să se manifeste și dezovente precum și diferite trăsături de caracter.

În final vorbind despre performanță nu putem omite spectacolul oferit de concursurile oficiale care atrag, după cum se știe, un public extrem de variat în ceea ce privește vârsta, preocupările și nivelul de cultură.

The beginning in any social, professional or personal life considers the finality, the level of success in that field of human activity .Similarly in tennis game the finality means to win points which will finally lead to victory. The following pages is a brief presentation of the amateur and professional tennis game stressing the similarities and differences between them.

The amateur tennis game is that kind of activity free from any constraints and whose purpose is just to have fun and moments of relaxing .Unlike the professional tennis game the amateur one has the advantage of being played until an old age in organized contents- the old-boys contents- or less organized ones.

The benefits of the tennis game are obvious at all biological stages of human beings. Among these we can mention:

- the child improves his/ her physical and psychical health
- in the junior style of playing it can be easily noticed manifestations of his/her own personality
- the young has the chance to get rid of his/her extra-energy so characteristic to that age

Obs: Besides the health benefits of practicing this sport we can also add the advantage of having a programme different from the school one and the chance of getting in touch with other children of similar ages. It is well-known that one of the most important function of practicing any sports is that of socializing and interaction in an organized group whose cohesion and unity is given by a common purpose: tennis game.

- the grown up enriches his/ her health and the working capacity
- the third aged people get the respect of the sportive world, their abilities and capacities contributing to the creation of a real show on the tennis courts

To sum up we can say that to practice any sports means a health preoccupation for a dynamic life.

It is true that the amateur tennis game may seem naïve for any professionals because the game rules are not strictly respected. However it is advisable to be practiced with the entire power of heart and mind as long as the they have the passion for this game active.

At the opposite side there is the performance tennis. We should start by saying that performance means first of all a superior discipline of behavior developed in exact units of time. Secondly performance means to get a very good result in a competition, to be the best among the best. We can also mention here the super-performance which means a mixture of obtained score in different international contests and sports value.

Those who choose performance besides the previously mentioned advantages have many other benefits like:

- they manage to give a concrete material form to their physical effort
- they discipline their lives
- have a healthy style of life
- get used with the sportive fight

In tennis there is a moment when the professional tennis player must face a great pressure both during an official match and the training. The player who cannot face such a pressure is put aside; the one who shows a great resistance to stress has to choose between the chance of becoming a top tennis player or remaining a second-value player animated by the desire of becoming a champion one day. There also might be tragic moments when the player may suffer a serious accident which forces him/her of giving up his/ her dream of becoming a champion.

However the benefits of a professional tennis player can be found at all the levels of his/her social and psychological life. Socially he gets different sensibilities, is admired or by the contrary envied by some colleagues, is protected or punished and somehow gets isolated from the society found of fun and party nights preferring the sports micro-society.

Besides the individual effort the material effort is necessary, too. It gets bigger if the tennis player value increases. Adequate equipment and the best tennis rackets are absolutely necessary. At all these it can be added a strict diet, money for

participating to different national contests plus the training hours which, as it is well-known, are very expensive; and not only in our country but everywhere in the world comparing to the salaries of the great majority of people. All this huge financial effort is sustained especially by the parents but the clubs and different sponsors can be added.

Psychologically speaking some benefic changes can be noticed, too. Intellectual and affective and qualities start to develop and different positive traits of character. The complexity and intensity of the trainings are perfectly adapted to the age, value and the future necessities of the players.

Finally speaking about performance we cannot omit the spectacle offered by the official contests which attracts a great and very varied public concerning the age, interests and level of culture. But the success of an official circuit also depends on the sponsors and on those who organize it.

For a better understanding of the complexity of this sports I suggest a minute analyze of it. It is well known the feeling of ease and simplicity of those who watch a tennis match from the tribune or in front of the television. But behind this simplicity there is a lot of preparation, rigorous training and a strict diet; in other words a lot of hard-working. For an official match the tennis player must have a good theoretical pedagogical, psychological and physical training with a close link between them, one being the base of development for the others.

#### 1. Theoretical training

Theory is a system of principles which form the ideological content of any science, art or conception about world.

The theoretical study of any field of activity requires a share of it into essential chapters or parts which finally will offer a structured image of the analyze.

The theoretical concepts of the tennis game are offered to the players in the organized framework of a classroom with blackboards, chalk, tables and chairs. Of course all these theoretical concepts are put into practice outside on the tennis court.

#### 2. Pedagogical training

In a very modest attempt to define pedagogy we might say that it is the science which deals with the behavior education of the tennis players. Pedagogy has a permanent character noticeable in the every day human manifestations. But when something new appears in the individual's universe a totally unusual behavior is noticed.

Pedagogy has been divided in:

- general pedagogy
- pre- scholar pedagogy
- scholar pedagogy
- pedagogy of the university schools

Tennis game is included in the pedagogy of the body activities which are studied at the Sports Faculty. The role of the sports teachers is a very important one especially in the case of disabled children.

Pedagogical activity finds its form of manifestation through education which is the conscious and steady influence upon the intellectual, moral and physical development both of the children and grown ups during their entire life.

There are different types of education:

- intellectual
- moral
- aesthetic( the aspect of the human body, the clothes, the social event)
- sportive

Tennis game implies some behavior standards:

- a certain decency on the tennis court
- a certain decency during the match
- fair-play
- correctness
- discrete manifestation after the match

### 3. Psychological training

Psyche is a characteristic of the superior organized matter of reflecting the objective reality. Psychology is the science which deals with the study of the psychical activity including specific psychological human phenomena: concentration, mentality and those which influence a certain activity.

In tennis there are the following psychical processes:

A) Motivation that offers trust in one's own capacities so necessary in the delicate moments of a match or in the case of defeat. The success leads to a very positive state of mind which motivates the player to continue.

#### B) Attention and concentration

Attention is a complex psychological process voluntary or not, characterized by the separation between what is considered to be essential from non-essential things.

Concentration is the capacity of ignoring everything around you and of focusing only upon the desired target.

Attention and concentration are very important in tennis game because they may lead to the finding of some tactical solutions of defeating the opponent. The only moments of relaxation are those during the breaks.

Concentration is a sort of breathing gymnastics which can be divided in two categories:

- the two kinds of exhaling/ inhaling are used during the break between the hits (nose-nose for brain; nose- mouth for lungs; mouth-mouth for abdomen)
- the hit is preceded by a forced exhaling immediately followed by an inhaling breath at the half of the chest cavity. The result is some noise which sometimes can be disturbing.

The ball's trajectory starts with the service hit that is very important because the tactical domination of the opponent depends a lot of its success. The player who serves is obliged to let to his/ her opponent enough time to prepare for receiving the ball. If his/ her opponent is not ready he/ she delays to send the ball in the other half by beating the ball in his/her own half. In the same time he/she chooses a strategy of sending the ball in a certain area of the opposite half.

The high degree of attention and concentration naturally requires the necessity of finding different methods of relaxation (swimming and the shower are most often used).

#### 4. Physical training

It is well known that the professional tennis players are submitted to joint pains and bone deformation. That is why a lot of attention is paid to the physical training. Athletics and gymnastics are welcomed in this situation.

The official contests obliged the players to a detailed preparation of every body parts. There is a great number of physical exercises due to the infinite combinations of movements. Their intensity and volume are carefully chosen by the trainer according to the age and the value of the player.

A good physical shape is very difficult to obtain but it is very easy to lose.

#### **Conclusion**

...performance is for those who want victory and sports glory and who are ready to a lot of sacrifices for them; the amateurism is for those who look for a way of relaxing themselves and of spending their free time in a pleasant manner. The difference between the two categories is the degree of self-sacrifices and compromises they are ready to make. The intensity and pleasure of practicing the tennis game is the same.

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**EVALUATING THE FITNESS LEVEL OF THE STUDENTS  
FROM THE BABEȘ-BOLYAI UNIVERSITY  
– A COMPARATIVE STUDY**

**POP NICOLAE HORAȚIU<sup>1</sup>**

**REZUMAT.** Evaluarea condiției fizice la studenții anilor I și II ai Facultății de Geografie din cadrul U.B.B.(II). În lucrarea de față ne propunem să prezentăm nivelul condiției fizice la studenții anilor I și II din cadrul Facultății de Geografie. Pentru evaluarea condiției fizice am folosit bateria de teste EUROFIT. Nivelul de pregătire fizică al studenților anilor I și II din cadrul Facultății de Geografie este “bun” spre “foarte bun”.

This paper wants to continue the series of papers written on evaluating the physical fitness level of the students of various disciplines from the Babeș-Bolyai university.

Physical ability is defined as a natural disposition, an aptitude which refers to the body of living beings, especially to the muscular activity.

Renato Mano – in his book „The theoretical basis of sport practice”<sup>2</sup> – defines physical abilities as essential elements of the capacity of performing physical and sporting exercises. They constitute the indispensable functional premises to learn and carry out physical and sporting exercises.

As in the previous years, the evaluation of the physical condition has been done on the basis of the „Eurofit” tests, which are accepted by the European Community as relevant in this respect. The different events were carried through at the end of the semester and they had been established as an objective from the very beginning so that the students prepared for them during the whole semester. As a consequence the tests also represented a means to interest the students in and motivate them to take part in the physical education classes in a period during which physical exercise in an organized framework, the students being to some extent obliged to attend the classes, does not raise much interest on behalf of the students.

The test results from the first year students of the Faculty of Political Sciences will be presented and afterwards included in a diagram along with results from running the tests on different students during the last years in order to facilitate a comparison.

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<sup>1</sup> Faculty of Physical Education and Sport

<sup>2</sup> Original title “*Fondamenti dell’allenamento sportivo*”, Bologna 1989

The test was made up of three events:

**1. Standing long jump:**

**Item tested:** explosive strength

**Materials needed:** measuring tape

**Test description:** long jump starting from standing. The subject stands behind the starting line, which is marked on the ground, with their knees bent, moving the arms back and forth and then jumps as far as possible. The landing has to be with the knees kept together.

**Evaluation:** the subject is allowed to jump twice. The best result in centimetres is recorded.

**Table 1**

*Evaluation of the explosive strength*

Age	Male			Female		
	Weak	Good	Very good	Weak	Good	Very good
17-19	190	220	245	145	170	200
Youngsters	185	210	230	140	160	180

**2. Lifting the body from sitting:**

**Item tested:** abdominal strength

**Test description:** the body is repeatedly lifted vertically for 30 seconds as the subject is lying on their back, with their hands at the back of the head, bent knees and the feet steadily on the ground. The liftings are carried out as fast as possible while the knees have to be touched with the elbows.

**Evaluation:** the total number of complete and correct liftings performed in 30 seconds is recorded.

**Table 2**

*Evaluation of the abdominal strength*

Age	Male			Female		
	Weak	Good	Very good	Weak	Good	Very good
17 – 19	22	27	31	16	21	26
Youngsters	19	23	28	14	20	25

**3. Lifting the body from lying face-down**

**Item tested:** back strength

**Test description:** repeatedly lifting the body for 30 seconds from lying face down with the hands at the back of the head. The liftings have to be as high as possible.

**Evaluation:** the total number of complete and correct liftings during 30 seconds.

**Table 3**

*Evaluation of the strength of the back*

Age	Male			Female		
	Weak	Good	Very good	Weak	Good	Very good
17 – 19	26	28	31	21	23	26
Youngsters	23	25	28	19	22	25

The data have been statistically processed using the formula  $x = \frac{T}{N}$  and then compared to the reference data of the Eurofit tests.

**Table 4**

*Values obtained after the statistical processing of the students' results in 2006*

Year of study	Male			Female		
	Long jump	Abdominal strength	Strength of the back	Long jump	Abdominal strength	Strength of the back
I	220,1	21,3	31,9	169,5	20,9	31,9

**Table 5**

*Values obtained after the statistical processing of the students' results in 2004*

Year of study	Male			Female		
	Long jump	Abdominal strength	Strength of the back	Long jump	Abdominal strength	Strength of the back
I	220	16.4	30.2	163	17	27.5
II	220	16.4	30.2	164.7	18.4	26.5

**Table 6**

*Values obtained after the statistical processing of the students' results in 2005*

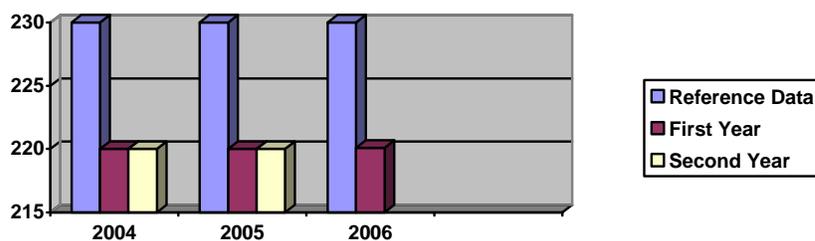
Year of study	Male			Female		
	Long jump	Abdominal strength	Strength of the back	Long jump	Abdominal strength	Strength of the back
I	220	16.4	30.2	163	17	27.5

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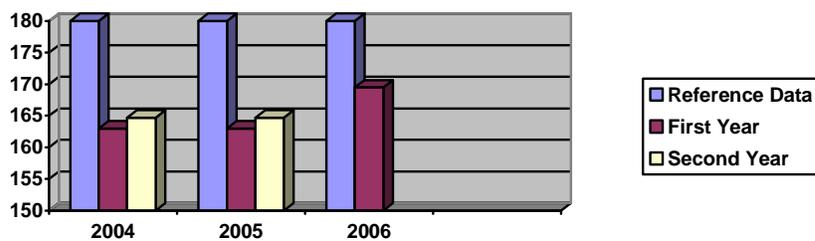
II	220	16.4	30.2	164.7	18.4	26.5
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Graphic comparisons

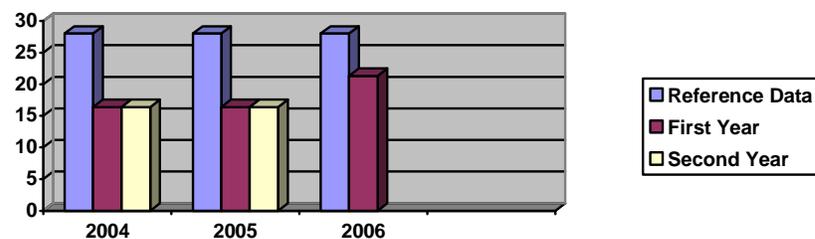
Long jump male students



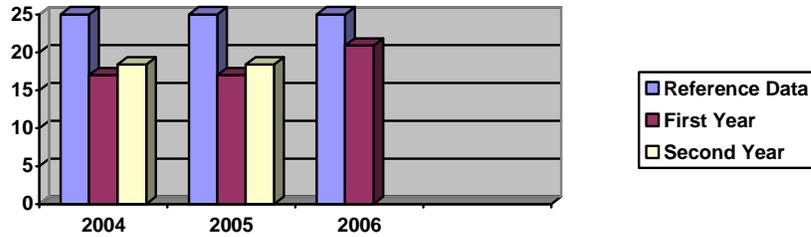
Long jump female students



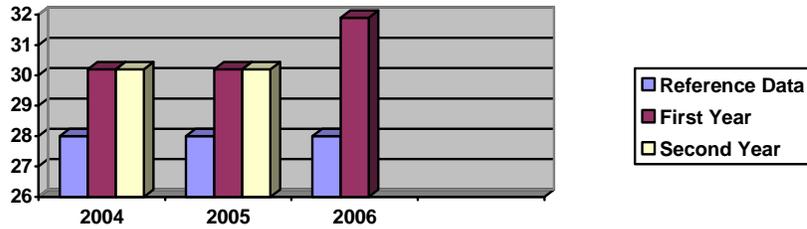
Abdominal strength male students



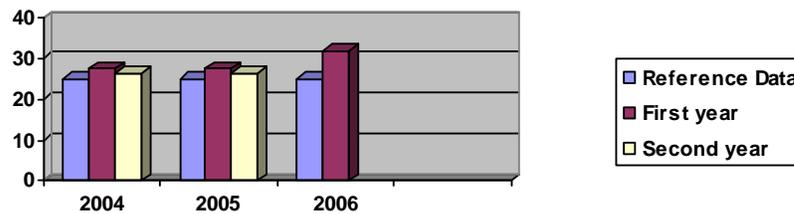
Abdominal strength female students



Strength of the back male students



Strength of the back female students



A pleasing fact is evident from the graphical comparison of the data, namely an increase in the physical fitness from the first tests runned in 2004 to the last ones in 2006. Starting from avarages between *good* and *very good* in 2004, the results in 2006 exceed the reference data of a *very good* fitness level.

This is even more surprising as in modern society one can constantly notice the tendency of young people towards activities which do not imply

increased physical exercise, ignoring doing sports as a means to maintain physical and by this implicitly mental health.

From a pedagogical point of view, the study allows us to consider the methods which we use during the physical education classes as appropriate and the objective as reached. Unfortunately, the observations subsequent to running the tests on these groups of students reveal that very few of them continue to do physical exercises on their own. This aspect constitutes a weak point of our educational process and this is the field where improvement should be aimed at.

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EVALUATING THE FITNESS LEVEL OF THE STUDENTS FROM THE BABEȘ-BOLYAI UNIVERSITY

**FEMALE STUDENTS**

Nr.	Subject	Long jump	Abdominal strength	Strength of the back
	A.M	180	17	35
	A.L	175	20	30
	B.I	155	20	33
	B.C	205	16	31
	B.N	180	18	26
	B.V	160	12	28
	B.L	150	16	26
	C.B	190	20	33
	C.E	150	16	20
	C.O	165	15	26
	C.C	180	17	32
	C.I	160	15	43
	C.A	190	20	34
	C.I	150	22	32
	C.O	150	16	37
	D.R	170	17	36
	D.A	165	25	26
	D.C	180	16	32
	G.V	160	25	33
	G.R	160	15	30
	G.C.	150	24	34
	G.A	160	38	23
	G.B	165	25	34
	G.A	170	20	34
	H.M	170	22	30
	H.G	165	15	45
	H.A	165	18	34
	I.S	160	17	29
	I.C	180	26	30
	I.S	150	18	37
	L.D	190	16	31
	L.D	190	27	33
	L.A	175	17	36
	L.G	155	32	35
	L.A	190	31	35
	M.L	155	23	25
	M.A	180	33	40
	M.L	200	32	34
	M.L	160	24	25
	M.L	175	23	30

## POP NICOLAE HORAȚIU

**MALE STUDENTS**

<b>Nr.</b>	<b>Subject</b>	<b>Long jump</b>	<b>Abdominal strength</b>	<b>Strength of the back</b>
	A.F	235	28	30
	G.N	220	27	31
	P.R	200	16	30
	B.V	235	21	38
	C.M	230	15	23
	C.O	200	16	28
	D.A	230	19	32
	S.E	210	23	31
	S.M	210	22	27
	S.P	250	13	25
	S.D	210	26	31
	V.A	200	22	30
	D.R	225	19	33
	F.A	215	17	34
	D.A	230	21	26
	F.I	215	19	35
	F.T	215	20	34
	F.V	250	34	43
	R.R	225	30	38
	G.L	230	23	33
	H.D	200	27	37
	M.C	220	31	31
	M.C	200	24	33
	M.O	225	20	39
	M.I	205	24	35
	M.V	205	17	27
	M.P	230	23	34
	O.V	260	16	32
	O.T	220	16	32
	B.P	200	21	27
	C.A	200	16	34
	C.M	225	15	34
	S.D	200	16	22
	T.L	230	18	27
	V.O	210	16	32
	A.M	225	20	31
	F.M	210	16	32
	V.D	230	29	42
	V.C	235	29	33
	G.A	240	28	33

**EXPERIMENTAL STUDY CONCERNING THE POSSIBLE  
INVOLVEMENT OF THE PHYSICAL THERAPIST  
IN THE PREVENTION AND RECOVERY  
OF YOUNG PEOPLE WHO TAKE DRUGS**

**BALINT TATIANA<sup>1</sup>, BALINT GHEORGHE<sup>1</sup>,  
OCHIANA NICOLAE<sup>1</sup>, OCHIANA GABRIELA<sup>1</sup>**

**REZUMAT. Studiu experimental privind posibilitățile de implicare a Kinetoterapeutului în prevenirea și recuperarea tinerilor consumatori de droguri.** În România, drogurile reprezintă o problemă relativ nouă, apărută după 1990. După această perioadă, deschiderea granițelor și slăbirea coerciției din partea statului, a făcut posibilă pătrunderea drogurilor, inițial sub forma drogurilor, apoi sub forma consumului. Mijloacele mass – media anunță numărul din ce în ce mai mare de tineri implicați în consumul de droguri.

Pornind de la ideea complexității cauzelor și efectelor consumului de droguri, am abordat pe parcursul acestei cercetări, atât aspectele bio-psiho-sociale, cât și cele practice legate de importanța, rolul și locul kinetoterapeutului în recuperarea tinerilor consumatori de droguri.

Studiul urmărește o nouă perspectivă care încearcă să scoată în evidență rolul/locul kinetoterapeutului în programul de tratament al toxicomanului. Din echipa multidisciplinară, care se poate ocupa de reabilitarea fizică, psihică și socială a consumatorului de droguri, trebuie să facă parte și kinetoterapeutul, care prin mijloacele kinetoterapeutice, poate să contribuie la recuperarea fizică și psihică a consumatorului de droguri.

**Introduction**

In Romania, drugs are a relatively new problem, which appeared after 1990. From that time on, the opening of our borders, the weakening of the state coercion made it possible for drugs to invade our country. The mass-media informs us about the growing number of young people who use drugs.

Drugs contaminate, corrupt, and destroy people and even whole societies, ending many innocent lives. Since the dawn of mankind, drugs have accompanied us, and they are still fascinating, still raise the interest, requiring strict counter-measures, but they also raise questions that have not yet been properly answered.

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<sup>1</sup> *University of Bacău; Faculty of Movement Science, Sports and Health*

The permanent use of drugs reflects a pain, even the impossibility to achieve a proper behavior during usual situations or during conflicts, which makes people weaker on professional or personal level, and makes them susceptible to the use of drugs when they have the opportunity to get them.

That's when we see the importance of the society in supporting the people who take drugs.

Starting from the idea that the causes and effects of the consumption of drugs are very complex, the present research has approached not only the bio-psycho-social aspects, but also the practical aspects dealing with the importance, the role and the place of the physical therapist in the recovery of the young people who take drugs.

**The assumptions** which were the starting point of the present research are as follows:

- We suppose that by using the physical therapy methods and techniques in addition to the classical medical treatment we could improve the physical and mental skills of the patient.
- We suppose that, by using means and methods specific to the physical therapy, a specialist in this field can be involved in the prevention and recovery of young people who use drugs.

#### **The objective of the research**

The present study is integrated into a new trend which is trying to emphasize the role and the place of the physical therapist in the program for treating drug addicts. The physical therapist must be part of the joint team that takes care of the addict's physical, mental and social reintegration. Through physical therapy methods, he can contribute to the physical and mental recovery of the drug addict.

Romanian legislation underlines the place of the physical therapist in the recovery of drug addicts.

Thus, in the Directive No.187/March 2002, signed by the Secretary of State for Health and Family, Mrs. Daniela Bortos, in order to define the types of medical facilities that can be authorized to offer medical assistance to drug addicts, the following specification is made:

#### **The recovery facilities for the drug addicts must be provided with:**

- **An ergo therapy and occupational therapy base;**
- **Physical recovery and medical gymnastics departments;**

Our research took place in the recovery office of the Drug Prevention, Evaluation and Advisory Center.

There were 10 subjects involved in the present study. The research ran over a period of one year.

Considering the clinical and functional manifestations of such a person, the type of drug he/she uses and the way he/she takes it, we have selected **specific methods and evaluation tests** as follows:

- tests for evaluating the balance and stability (the Romberg test, the “pushing” test, the unipodal test, the tense posture test);
- tests for evaluating the respiratory system (the apnoea test, the match test, conversation – reading);
- tests for evaluating the physical condition (the Ruffier test, the test for measuring the cardiac index);

**The physical therapy means and methods** used during the research were the following:

- massage means, methods and procedures and complementary techniques (reflexotherapy);
- medical gymnastics;
- respiratory gymnastics;
- abdominal gymnastics.

**The general objectives** specific to the physical therapy intervention were the following:

- to regulate the activity of the vegetative nervous system;
- to rehabilitate the functioning of different systems (the respiratory system, the cardiovascular system, the digestive system);
- to prevent and to rectify the improper reactions of the body;
- to recover and to increase the balance and the general condition of the body;

**The results** were the following:

- o Analyzing the cases, we have noticed that the physical therapy treatment which followed the cure led to an improvement of the mental and physical life of the subjects.
- o The physical therapy also managed to recover some functions that have been affected by the intake of drugs (each substance taken, as well as each way of taking the drug can lead to specific disabilities or functional disorders).
- o The concern of the joint team, which also included a physical therapist, was to prevent a later return to the use of drugs, which has happened in 80% of the cases. At the same time, a social and professional reintegration of the patients has been achieved.

The recovery process is a continual one, and a limited intervention can't be successful for the reintegration of the drug users into a normal life.

Thus, it is time for us to realize the range and the destructive potential of drug addiction not only on an individual, but also on a social scale. We must be

aware of the necessity of making immediate and strict interventions to control this phenomenon, since the drug abuse is a real threat for the present and for the future generations, as dangerous as the plagues that have invaded the world.

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## **SPECIFIC TESTS USED TO ASSESS THE FUNCTIONAL INDICATORS OF PEOPLE WHO PRACTICE AEROBICS**

**OCHIANĂ GABRIELA<sup>1</sup>, OCHIANĂ NICOLAE<sup>1</sup>**

**REZUMAT.** Teste specifice folosite pentru evaluarea indicatorilor funcționali la persoanele ce practică gimnastică aerobică. În ultimul timp din ce în ce mai multe persoane active practică o formă organizată de mișcare în scopul menținerii la parametri superiori a stării de sănătate, dar și pentru menținerea sau recăștigarea unui aspect estetic plăcut obiectivat prin scăderea în greutate, micșorarea diametrelor corporale și nu în ultimul rând o adaptare mai eficientă a aparatului cardio-respirator la solicitările din activitățile zilnice.

*Scopul* a fost de a selecta cele mai eficiente teste care să faciliteze realizarea profilului morfo-somatic și funcțional al persoanelor care practică gimnastica aerobică, teste care să fie eficiente și care să poată fi folosite de orice specialist în condiții similare.

Folosirea măsurătorilor antropometrice, a indicelelui Kulcsar, testului Ruffier, testarea VIMS-ului și VEMS-ului și proba Schellong contribuie la formarea unui profil morfo-funcțional care reliefează atât aspectul estetic cât și capacitatea funcțională cardio-vasculară, responsabile de menținerea stării de sănătate la un nivel optim.

**Key words:** aerobics, functional indicators

### **Introduction**

Nowadays, more and more dynamic people are practicing an organized form of sport in order to keep their health in good parameters, to keep or to regain a pleasant esthetic appearance by losing weight or by decreasing their body measurements and, which is also very important, to adapt their heart and respiratory systems to the daily requirements.

The purpose of the present study was to select the most efficient tests in order to make a morpho-somatic and functional profile of the people who practice aerobics, tests which should be efficient, and which could be used by any specialist in similar conditions.

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<sup>1</sup> University of Bacău; Faculty of Movement Science, Sports and Health

### **The assumption of the research**

The assumption which is the starting point of our research is that we can make a proper morpho-functional profile for each separate case by using on one hand, the weight, the circumference (of the chest, the waist, the hips and the thigh), the Broca and the Kulcsar indices as somatic indices, and on the other hand, the Ruffier, Lian, Shelling, VIMS, and VEMS tests as functional evaluation tests for the adaptability of the heart and respiratory system.

### **Subjects, methods, the organization of the research**

The present experimental study has been carried out on a group of 10 female subjects, over a period of 12 months in the gymnasium of the Faculty of Movement, Sports and Health Sciences, at the University of Bacau. The criteria for being admitted in the study were to be between 20 and 40 years old and not to have any disease.

The research methods have been the known ones, and as *assessment methods* we have used:

The *anthropometric measurements* (height, weight, chest circumference, waist, hips, thigh and shank circumference);

- *The Broca nutrition index;*
  - *The Kulcsar method;*
- Functional Tests: the Ruffier, Schellong, Lian test.*

*Respiratory tests:* VIMS – tested with Triflo, VIMS – tested with Voldyne, VEMS – tested with the Vitalograph.

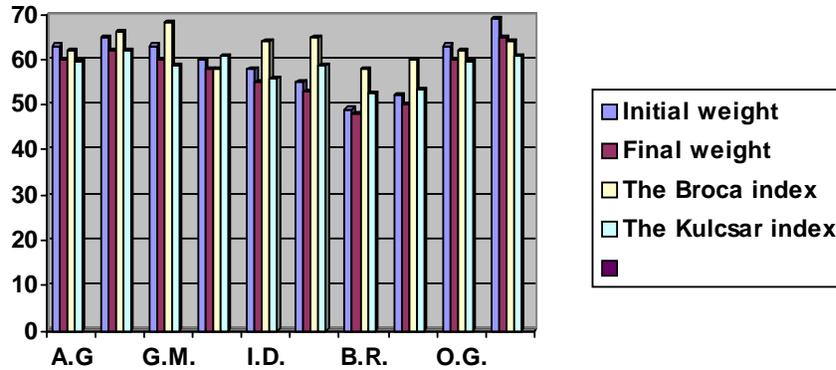
*The heart frequency*

In this context, *the aerobics class* took 45-50 minutes, and it was structured in 4 parts, namely: *the warm-up* which lasted 5 to 10 minutes, *the aerobics part* which lasted 15 to 20 minutes, *the exercises on the floor* lasting 10 to 15 minutes and *the ending part*, when the functional parameters must come back to the normal levels, which lasted 6 to 8 minutes.

### **Interpretation of the results**

In order to compare the results obtained during the initial and the final testing using the above mentioned tests, as well as for underlining the beneficial influence of aerobics on the human body, we have used a graphical description.

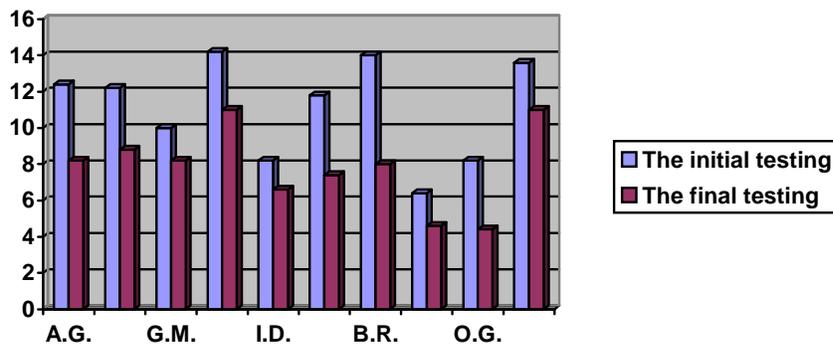
**Graph no. 1** Comparison of the initial and the final weight and the one given by the Broca and Kulcsar indices



As shown in the graph above, we can see that the subjects of the study group have registered a loss in weight at the final testing, the results being closer to the Kulcsar index, which represents the ideal weight considering the height and the age of the subject, than to the Broca nutritional index.

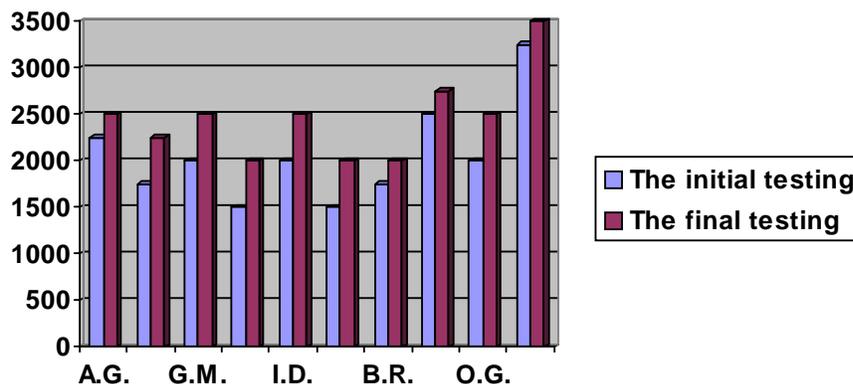
As we can see in graph no.2, the results of the Ruffier test have decreased significantly during the final testing as compared to the initial testing, fact which shows a proper adaptation of the body to the effort.

**Graph no.2** Results of the Ruffier test



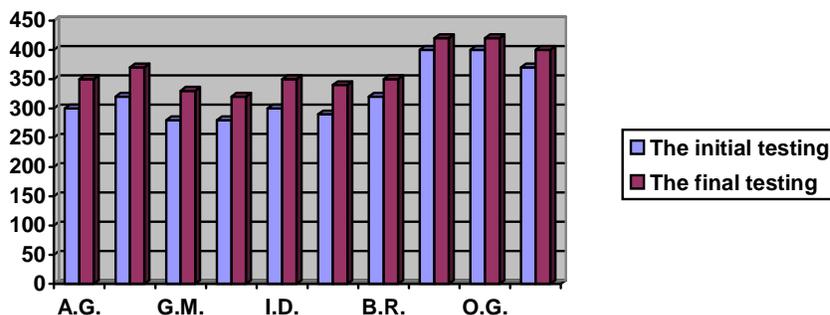
In graph no. 3 are presented the results of the VIMS tested with Voldyne, and the significant improvement of the final results is obvious. In graph no. 4 are presented the initial and the final results of the VEMS.

**Graph no.3** Results of the VIMS (Voldyne)



During the initial testing, after the *Lian* test only 7 out of the 10 subjects have had a slow recovery of the heart beat frequency, that is more than 4 minutes after ending the effort, while in 3 cases the adaptation after effort is good, the recovery of the normal heart beat being done in 3 minutes. During the final testing, 8 subjects have recovered in 3 minutes, 1 subject has adapted 4 minutes after the effort ended, and 1 subject has had a satisfactory adaptation.

**Graph no. 4.**Results of the VEMS (Vitalograf)



During the initial testing, after the *Schellong* test, 7 out of the 10 subjects have had a normal adaptation of the FC and the TA, one of them didn't have a proper adaptation of the FC and in 2 cases the TA got lower than 10 mm Hg when passing from horizontal position to the vertical position.

During the final testing, all subjects had a proper adaptation of the FC and the TA when passing from the horizontal position to the vertical position, which means that they had a proper neural-vegetative adaptation.

### **Conclusions**

At the end of the experiment we have conducted in order to check the importance and the efficiency of some functional tests on people who practice aerobics, our initial assumption has been confirmed.

As a result of this research, we can draw a series of conclusions as follows:

□ The anthropometric measurements (height, weight, chest circumference, waist, hips, thigh and shank circumference) are necessary when comparing the final results to the initial results, as they give a pleasant esthetic appearance to people who practice aerobics;

□ The Kulcsar index (which represents the ideal weight considering the height and the age of the subject), is unquestionably a useful indicator;

□ The Ruffier test is *a useful functional test for assessing the adaptation of the cardio-vascular system in case of a longer effort reaching 60% - 70% or 80% of the FCMax.*

□ The testing of the VIMS using the Voldyne device and the testing of the VEMS using the Vitalograph are important because they actually emphasize the improvement of the respiratory function, more exactly the improvement of the *maximum inhalation volume per second (VIMS)* and of the *maximum exhalation volume per second (VIMS)*;

□ The Schellong test is useful because it shows the neural-vegetative adjustment when passing from the horizontal position to the vertical position.

The use of the tests mentioned above - the anthropometric measurements, the Kulcsar index, the Ruffier test, the testing of the VIMS and of the VEMS, as well as the Schellong test – contribute to the making of a functional profile meant to emphasize both the esthetic aspect and the functional cardio-vascular capacity which are equally responsible for keeping your health in good parameters.

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## **STUDY CONCERNING THE TEACHING OF SOCCER DURING THE PHYSICAL EDUCATION LESSON IN THE NON SPECIALIZED FACULTIES**

**PAVEL SILVIU<sup>1</sup>**

**REZUMAT.** Studiu privind predarea jocului de fotbal în lecția de educație fizică la facultățile neprofil. Studiul își propune, în baza unui chestionar administrat studenților de la facultățile de neprofil să confirme necesitatea predării jocului de fotbal în cadrul lecției de educație fizică. Rezultatele obținute confirmă că fotbalul este o disciplină a cărei prezență este necesară în lecție și pentru faptul că stimulează interesul pentru mișcare al studenților.

The social progress is also present in the field of the physical education and sports, fact which determines the specialists, the educators, to look for new and efficient ways to carry out the physical education classes and to process the best methodical procedures, actual means that lead to the achievement of the purpose and of the tasks of the physical education and of the sport in schools.

As a team sports game that has a great popularity among young people, soccer is a means of social integration

The training of the students during the physical education lesson is superficially treated. On university level, the training of students is more difficult due to the tough conditions such as: the small number of hours, thus a limited time for training, insufficient equipment and materials. Nevertheless, the organization of the teaching process must be made and achieved according to the didactical technology used by the leading coordinates in the teaching process, according to which the student becomes a permanent cooperator for the teacher, who is going to organize the program, to assess and to guide the activity of the students.

### **Hypotheses of the research**

Due to its degree of accessibility and to the emotional satisfaction it generates, soccer is practiced not only in an organized way, with a competing purpose, but also occasionally, with an entertaining purpose.

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We have considered it is absolutely necessary to know the opinion of those who are really involved, that is the students of the non specialized faculties, and that is why we have made an investigation among them by using a questionnaire.

By using this questionnaire I wanted to pick up the necessary information that could confirm the necessity of teaching soccer during the physical education lesson and the important role it has in the achievement of the physical education objectives.

The questionnaire has a number of 10 questions, each of them with three choices of answer. It was meant to be as brief as possible, and the possible choices should make up a clear idea of the subject treated.

A number of 200 students at the non specialized faculties have been questioned, which is a representative number in order to make up an opinion concerning our topic.

We have asked the people questioned to give an answer as frank as possible, so as to be able to conclude the subject clearly, and in order to have an objective answer we considered it proper that the students questioned shouldn't reveal their identity.

We present you below the model of the questionnaire that has been presented to the students:

### QUESTIONNAIRE

This questionnaire has been made up in order to study the teaching of soccer in the non specialized faculties.

In this questionnaire are included a number of 10 questions, for which we require frank answers. The questions have 3 possible answers, and we ask you to tick the answer that you want.

No.	Questions	Possible answers
1.	In your opinion, is soccer popular during the physical education lesson?	a) Yes; b) No; c) I don't know;
2.	Do you think soccer is important during the physical education lesson?	a) Yes; b) No; c) I don't know;
3.	Do you think that through soccer you can get a better communication inside your team?	a) Yes; b) No; c) I don't know;

STUDY CONCERNING THE TEACHING OF SOCCER DURING THE PHYSICAL EDUCATION LESSON

4.	Do you think that, by means of soccer, we can have a better social life?	a) Yes; b) No; c) I don't know;
5.	Do you think that the physical education lesson becomes more dynamic due to soccer?	a) Yes; b) No; c) I don't know;
6.	Do you think that the physical education lesson becomes more pleasant due to soccer?	a) Yes; b) No; c) I don't know;
7.	Does soccer practiced during the physical education class demand enough effort, from the physical point of view?	a) Yes; b) No; c) I don't know;
8.	Do you practice soccer except during the physical education classes?	a) Yes; b) No; c) Sometimes;
9.	Do you relax when playing soccer?	a) Yes; b) No; c) I don't know;
10.	Would you also like to practice another game?	a) Yes; b) No; c) I don't know;

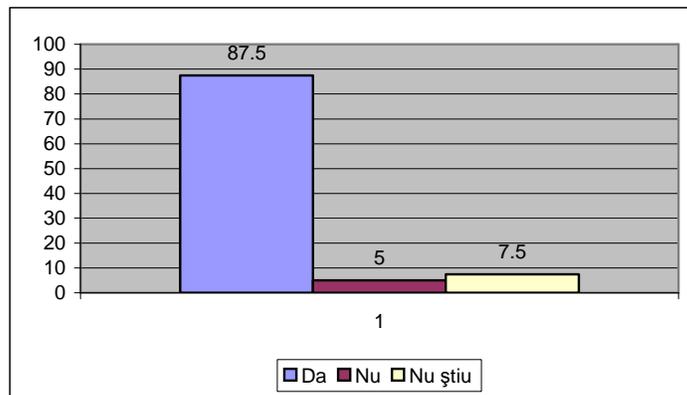
**ANALYSIS AND INTERPRETATION OF THE RESULTS**

To this purpose, the results of the questionnaires have been of great help. These results will be presented below, and for a better understanding we are going to use the graphical method.

These questionnaires used on students help us notice their perception concerning soccer during the physical education class, and also its role in achieving the physical education objectives.

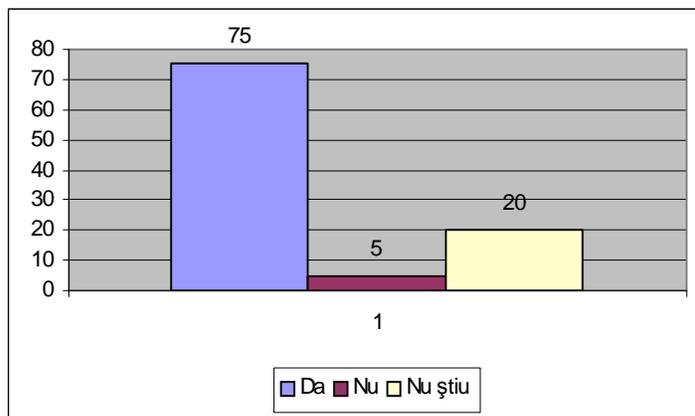
**Question 1**

In your opinion, is soccer popular during the physical education lesson?



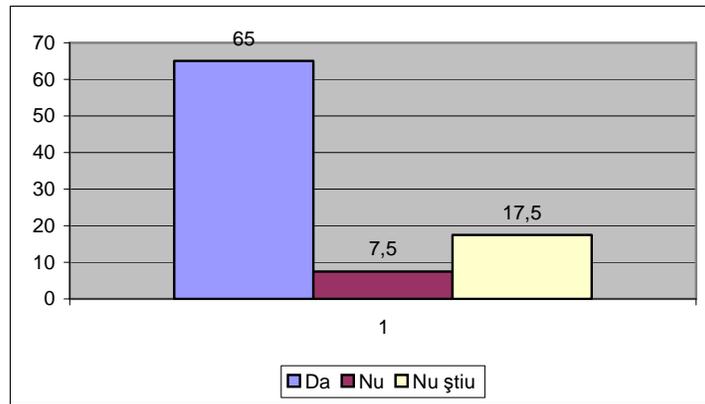
**Question 2**

Do you think soccer is important during the physical education lesson?



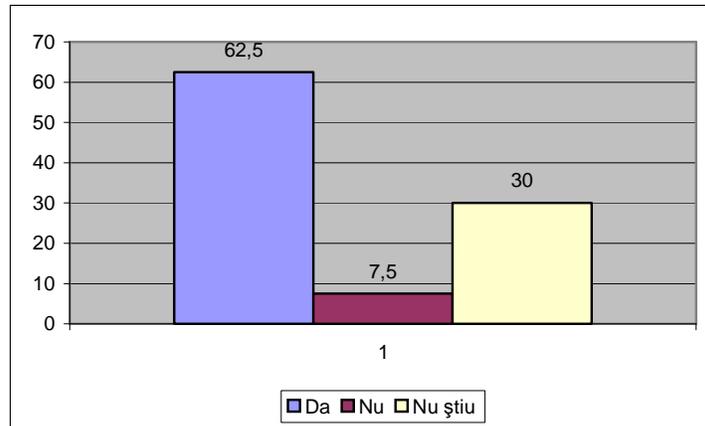
**Question 3**

Do you think that through soccer you can get a better communication inside your team?



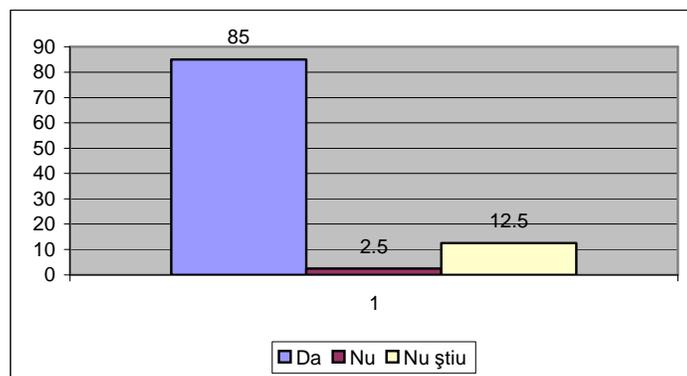
**Question 4**

Do you think that, by means of soccer, we can have a better social life?



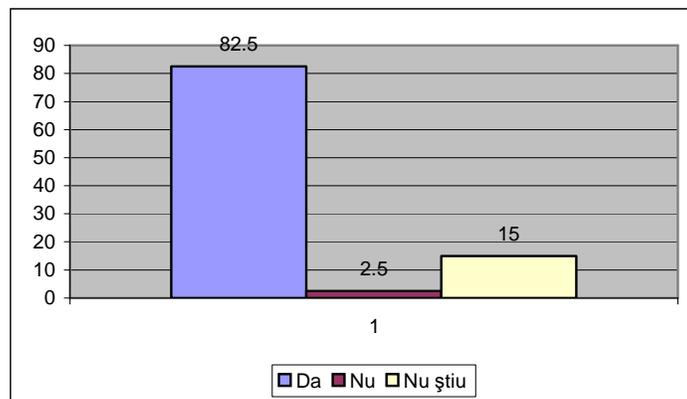
**Question 5**

Do you think that the physical education lesson becomes more dynamic due to soccer?



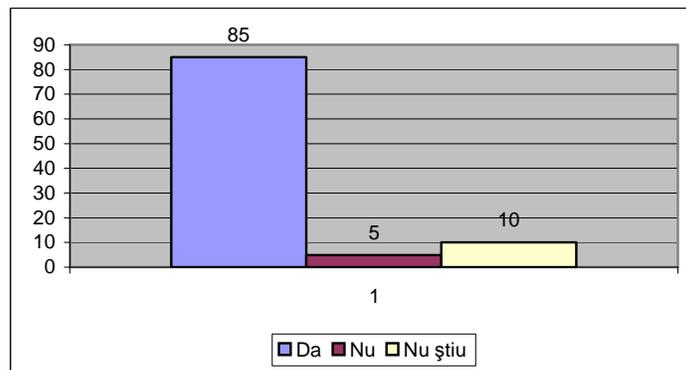
**Question 6**

Do you think that the physical education lesson becomes more pleasant due to soccer?



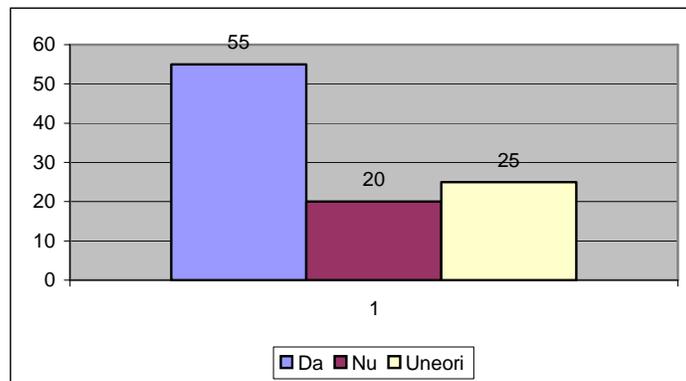
**Question 7**

Does soccer practiced during the physical education class demand enough effort, from the physical point of view?



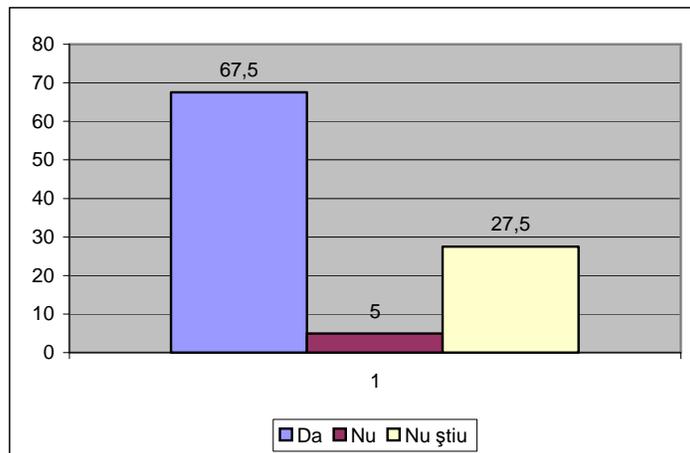
**Question 8**

Do you practice soccer except during the physical education classes?



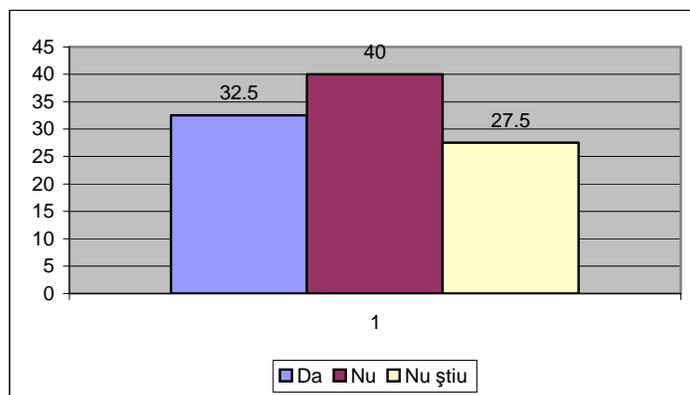
**Question 9**

Do you relax when playing soccer?



**Question 10**

Would you also like to practice another game?



By analyzing the graphs resulting from the questionnaires we can notice that there is a constants feature concerning the answers given by the students.

Nevertheless, we can state that the questions answered in the questionnaire have best reflected the necessity of teaching soccer during the physical education lesson in non specialized faculties.

The exceptional cases are due, in our opinion, to the present conditions in our country, especially to the family, to the impossibility of insuring the subject a minimum of knowledge necessary in order to carry out the physical exercise, to the anatomic and functional conditions of these people, as well as to the low level of mental qualities.

### CONCLUSIONS

Thus, we can state that soccer is a subject that is present during the physical education lesson and leads to a mixture of the instructive-educational process with pleasure and relaxation for the students. This stimulates, by its specific methods, the interest of the students in the exercise, fact that leads to a healthy physical and mental state of the individual.

We can say that after interpreting the data, the hypothesis, the purpose and the tasks of the research have been confirmed. The introduction of the basic elements of soccer during the physical education lessons in the non specialized faculties lead to the achievement of the general objectives of physical education and sports.

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PAVEL SILVIU

## THE BASKETBALL PLAYERS' PERSONALITY AND STRESS

MUȘAT SIMONA<sup>1</sup>, DIAMANTAKOS IOANNIS<sup>2</sup>

**REZUMAT. Personalitatea și stresul jucătoarelor de baschet.** Stresul ocupațional nu este în mod obligatoriu un fenomen negativ, un nivel moderat al acestuia poate deveni un important factor motivator și poate fi esențial în realizarea unei adaptări treptate la situațiile noi care vor apărea pe parcursul antrenamentelor și meciurilor. Personalitatea este cea care valorifică în competiții toate acumulările efectuate de sportivi la antrenamentele zilnice, în decursul multor ani.

Cercetarea a fost efectuată la o echipă de baschet feminin care evoluează în divizia A. Mai precis este un studiu de caz, datorită numărului mic de subiecți (10) cu vârsta cuprinsă între 16 și 22 de ani, 4 sunt studente, iar 6 eleve.

Calitatea sportivului de performanță este o rezultată a interacțiunii dintre factorii de personalitate cu specificul efortului sportiv și cu situațiile concrete apărute în antrenamente, dar mai cu seamă în meciuri. Dorim să evidențiem care este relația dintre trăsăturile de personalitate, stres și performanța sportivă.

The evaluation of the personality is a very important condition in the process of the formation and progress of the performance player positively influenced during the training and the games, as well as by the entire sport climate around him.

It would be easy if the performance would depend only on the quantity of work done or on the capacity of effort, but it depends on a complexity of factors as the players' personality, the momentary temper, the reaction to stress.

The sport performance is the result of a person with special qualities, but this is not just the result of the presence or absence of certain cognitive skills.

Ones personal features have a very important role in the professional performance and they may be very different one from another: feelings, attitude, and motivation as the specific attitude, interests, temperament, general-specific features, and anxiety.

The factors of the personality influence on the efficiency of the performance player:

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<sup>2</sup> Greece

The quality of the performance player is a result of the interaction between the factors of the personality and the specificity of the sport effort and the concrete situations that may appear during the trainings and especially in the competitions and games.

The common efforts are easily borne by the players if they rise progressively and the players can adapt themselves to the situations.

When these efforts are too big, they take too long time or they imply other mechanisms not trained enough/ not learned, a disturbance of the equilibrium occurs, a momentary disorder appears or a more deep reaction of stress.

The character is the one who gives value during a competition to all the accumulations that the player accomplished during daily trainings, during many years.

The trainers and in general all those who work for the sport performance should ask for the study of the character of the players in order:

1. to know them faster and better;
2. to protect them when they have to;
3. to stimulate them when necessary;
4. to find the better way of training;

We would like to underline the relationship between the players' character, stress and the sport performance. To investigate this relation we will utilise the DASS and 5 factors of NEO-PI-R.

## **METHODS**

Costa & McCrae's studies, 1985, 1989, 1992 made them realize and validate some questionnaires named **NEO-PI-R**, **NEO-FFI** which take into consideration 5 factors: Neurosis (N), Extroversion (E), Creativity (O), Agreeability (A), Conscientiousness (C).

**DASS** (Depression Anxiety Stress Scale) created by Lovibond & Lovibond (1995) is a questionnaire with 42 items that measure the depression, the anxiety and the stress.

The 5 factors impose itself because it describes a set of personality variables in connection with performance understanding. This represents an important aspect for all those who are interested in the sport field.

**BIG FIVE** factors highlights five dimensions of personality which, taken together, show the way in which the person responds in a typical manner to events and people. According to many psychologists, *Conscientiousness* factor would have an implication whatsoever in the sport success. We emphasize that a lot of writers (Landy & Conte 2004, Ones and Colab., 1993) sustain that not only one factor predict professional success but a combination of factors. That's why the relation between *Conscientiousness* and variables which are measured by DASS could offer us useful information in the analyzing team-players process.

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The research has been accomplished on a female team of basketball in division A. The team is made up from 12 players, 2 of them being foreigners haven't taken part in it. The players have from 16 to 22 years old, 3 of them are university students and 6 are high school students. They have been playing basketball for 6 to 11 years; they have been playing in this team for 2 years. At present they are going through a difficult period as the principal trainer has resigned. Nevertheless they gained a very important game.

**RESULTS**

**Tab. 1**

	Descriptive Statistics				
	N	Minimum	Maximum	Mean	Std. Deviation
E	10	36	82	67.20	12.70
A	10	39	84	67.90	12.49
C	10	34	84	67.50	15.23
SE	10	26	77	55.60	13.06
CREA	10	39	85	66.50	12.40
LIE	10	25	36	30.60	3.80
DEP	10	2	26	11.10	9.25
ANX	10	2	20	9.20	6.26
STRES	10	10	29	20.30	6.84
Valid N (listwise)	10				

**Tab. 2**

**Matrix correlation between DASS and NEO-PI-R**

DEP	ANX	STRES	N	E	O	A	C	LIE			
			DEP	1.00							
			ANX	.69*	1.00						
			STRES	.62	.63*	1.00					
		N	.21	.14	.49	1.00					
	E		.28	.28	.53	.80**	1.00				
	O		-.02	.04	.37	.76**	.86**	1.00			
	A		.17	.14	.47*	.95**	.64*	.65*	1.00		
	C		.26	.16	.64	.96**	.80**	.79**	.92**	1.00	
LIE			.39	.21	-.09	-.69*	-.42	-.64*	-.70*	-.64*	1.00

\* Correlation is significant at the 0.05 level (2-tailed).  
 \*\* Correlation is significant at the 0.01 level (2-tailed).

After the examination of matrix can be observed that there are factors obtaining some strongly representative correlation. (Neurosis is correlation with Consciousness and with Agreeability).

At the same time we can observe that there are also negative correlations, and some of them are non-representatives (Neurosis with scales of Lie, Creativity with Depression and Stress with Extroversion).

In the same order of ideas, although each of the factors predicts the success for some behaviour from this matrix results that some combinations seem to be predictors stronger than the factors taken separately.

Hogan & Hogan found that some of the factors enounced are related with fidelity of the employees. (In our case, sportsmen) (Mount & Barric, 1995)

When this phenomenon appeared, an important role has the cultural environment, and also the organizational climate. This is ascertained by the fact that we have negative correlations between the scale of lie and some variables of those two instruments that we had use. The explanation can be the situation less normal in which the experimental group find itself, because of the changing of the coach.

The values regarding the team captain are the most representative.

- The values of the neurosis being low we may affirm that she is a person who maintain her calm (she imposes the status she has in the team).
- She is less affected in stressful situations.
- She has a bigger capacity to resist to temptations and frustrations.
- She doesn't gat angry easily.
- She has self-esteem and self-control when facing stress.

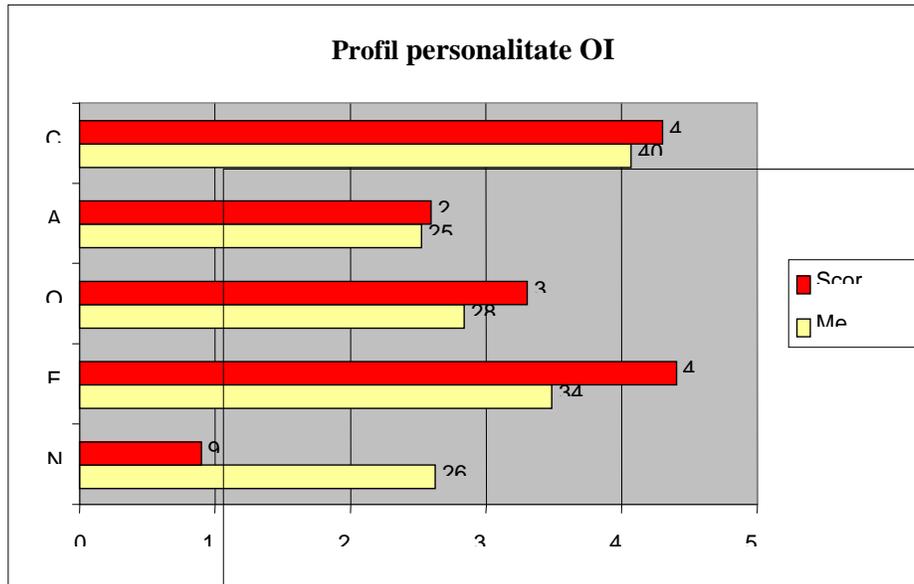
We may notice that the average score of the anxiety is (9,2) and if we consider it a specific feature it brings the occupational stress to (20,3)

A low Neurosis represents an emotional stability, when facing stress such persons stay calm, relaxed, with a constant temperament

Conscientiousness (40.7) refers to self control that regards the capacity of organize oneself, accomplishment of ones duties, planning. They are persons that always follow their goals, they are determined. Such persons are scrupulous, punctual and reliable.

Statistically speaking we wish to underline the low volume of participants at the study which evidently have influenced the statistical processing and also the results.

## THE BASKETBALL PLAYERS' PERSONALITY AND STRESS



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MUŞAT SIMONA, DIAMANTAKOS IOANNIS

## **ESCRIME: PLANIFICATION DU SUCCÈS OU PRÉPARATION DES ATHLÈTES DE HAUT NIVEAU\***

**LASZLO SZEPESI<sup>1</sup>**

*L'auteur analyse les facteurs quantitatifs du travail effectué au cours des entraînements et compétitions entre 1982 et 1992 effectués par 29 escrimeurs français d'élite. En dehors du journal d'entraînement, la matière de cette étude a été fournie par les sept tournois annuels de la coupe du monde et en plus par les huit compétitions préparatoires.*

### **Introduction**

La rédaction minutieuse d'un programme avec les détails de l'entraînement pour la journée, la semaine ou l'année, la quantification des charges de travail est inévitable dans les sports de haut niveau. Et ceci est vrai à plus forte raison pour les sports où l'on participe aux Jeux olympiques (JO), aux championnats du monde (CM) ou d'Europe. Tel est le cas de l'escrime où les CM se déroulant au cours de l'année qui précède les JO, servent de sélection pour les futurs participants aux Jeux.

Avant de passer à la rédaction du projet il faut clairement définir l'objectif de la performance à atteindre, calculer les charges de travail nécessaires et choisir les méthodes appropriées (1, 2). Les périodes prévues pour la préparation/ compétition se règlent sur le calendrier des compétitions. Outre le projet d'entraînement annuel on doit souvent établir d'autres programmes de durée variable:

- longue durée (4 - 8 ans)
- durée moyenne (2 - 4 ans)
- période (10 - 15 semaines)
- cycle (3 - 6 semaines)
- la semaine
- la journée

Plus la période d'entraînement envisagée est longue, plus il est facile de fixer les objectifs pour les charges de travail (3, 4). La durée des séances quotidiennes (une ou deux par jour) subit souvent des changements dûs à des circonstances extérieures (lésion, fatigue, motivation).

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<sup>1</sup>*Laszlo Szepesi: Préparations des athlètes de haut niveau: données caractéristiques de l'entraînement et des compétitions d'escrime. Dissertation PhD, 2004. Université Semmelweis, Budapest, Hongrie*

### **Période examinée et préparations**

L'insuccès international des 29 escrimeurs avant 1982 a été attribué à l'insuffisance des charges de travail d'entraînement et de compétitions de l'équipe.

Les JO de Los Angeles en 1984 et de Barcelone en 1992 ont eu lieu au début d'août, ceux de Séoul fin septembre 1988. Le travail préparatoire commençait toujours vers le 20 septembre et se terminait en général au milieu de juin, avec le CM ou les JO. J'ai divisé la préparation annuelle en 3 fois 14 semaines, avec un objectif particulier pour chaque période.

- Pendant la première période, les escrimeurs ont participé à un travail foncier classique: exercices de renforcement, courses à pied, jeux gymnastiques ou jeux de balles et puis, au fur et à mesure le travail foncier d'escrime a pris le dessus: travail de jambes, corde à sauter, exercices conventionnels, assauts méthodiques, etc (5). Le travail spécifique d'escrime n'a commencé qu'au cours de la septième, huitième semaine: leçons individuelles, travail à petite distance, assauts libres, matches d'entraînementst, etc. Cette période foncière s'est terminée mi-décembre par le tournoi de la coupe du monde de Nancy (2, 5).

- La deuxième période comprenait les tournois de la coupe du monde de Moscou, de Budapest, (Coupe Hungária), de Hanovre, et de New York. Cette période de compétitions servait à juger les adversaires et à trouver de nouveaux exercices et tâches tactiques. Dans cette période nous avons travaillé des éléments techniques et tactiques, pendant des leçons individuelles, et effectué des tâches spéciales d'assauts(6). Notre préparation a été complétée par des exercices spécifiques d'escrime, effectués en piscine sous l'eau à 3 mètres de profondeur. Cette situation fournissant une charge spéciale, contribuait à stabiliser les mouvements tactiques et techniques (1).

- La dernière période servait à mémoriser et à stabiliser définitivement les manoeuvres tactiques déjà développées (7, 8). Durant cette période il n'y avait que deux compétitions de la coupe du monde: l'une à Varsovie, l'autre à Padoue. Un stage de deux ou trois semaines en camp d'entraînement a complété notre préparation pour le championnat du monde et les JO (2).

Pendant les dix années étudiées la date des tournois de la coupe du monde a peu varié, le lieu parfois, les résultats étaient donc bien comparables. Voici leur chronologie exacte et le nombre des semaines préparatoires, comptées en partant du milieu de septembre.

Nancy: 10-12 semaines (entre 1982 et 1985 remplacé par le tournoi de Vienne, en 1992 par celui d'Athènes).

Moscou: 16-18 semaines

Budapest: 18-21 semaines

Hanovre: 22-24 semaines

New York: 24-26 semaines (organisé en 1990-92 à Washington)

Varsovie: 28-31 semaines

Padoue: 32-34 semaines.

Le tournoi de la coupe du monde de Padoue a été suivi par le championnat de France, 2 jours après et par le camp d'entraînement préparatoire pour le championnat du monde et les JO, après une pause d'une semaine. On voit donc clairement que notre travail préparatoire foncier pour la première compétition internationale de l'année (celle de Nancy) était en moyenne, ces dix années durant, de 11 semaines. Après quoi, nous avons pris part toutes les trois semaines à une série de compétitions de la coupe du monde. Les autres compétitions (championnats de France ou tournois internationaux de catégorie B) ont eu lieu pendant les semaines intermédiaires. Parmi ces dernières, la plus importante était celle du tournoi des "Sept Nations". Ces compétitions n'avaient pas de caractère de sélection.

### **Les sujets de l'étude**

Parmi ces 29 escrimeurs d'élite, il y avait trois groupes:

- 21 non sélectionnés, désignés dans ce qui suit comme le groupe réserve,
- 8 sélectionnés qui faisaient partie de l'équipe pendant la période observée dont:
  - 5 formaient l'équipe pour les CM et JO, mais les analyses portent sur les 8 formant le groupe restreint. Parmi ces derniers, trois étaient déjà des compétiteurs adultes en 1982: Jean-François Lamour (né en 1956), Hervé Granger-Veyron (1958), Philippe Delrieu (1959). Ils s'entraînaient depuis au moins 10 ans, mais aucun succès international.

Par contre, les 5 tireurs encore juniors en 1982: Franck Leclerc (né en 1962), Franck Ducheix (1962), Pierre Guichot (1963), Jean-Philippe Daurelle (1963) et Laurent Couderc (1969) qui est devenu membre de l'équipe bien plus tard, dans sa vingtième année; n'avaient jamais ou très peu reçu de leçons individuelles. C'est pourtant la forme la plus importante de la préparation des athlètes en escrime.

Lamour et Guichot ont fait partie de l'équipe durant toute la période examinée. Delrieu a été sélectionné 8 fois, Ducheix 7 fois, Granger-Veyron 6 fois, Daurelle devenu membre du groupe en 1989 a été sélectionné 3 fois, de même que Leclerc. Le dernier, Couderc, ayant dépassé l'âge de juniors, a été sélectionné 2 fois, en 1990 et 1992. Les charges de travail d'entraînement et de compétition, ainsi que les résultats des 21 membres du groupe large, ont été également notés.

### **Charges de travail hebdomadaires**

Durant la période du travail foncier, la charge était la même pour les 29 escrimeurs. Par contre, durant la deuxième et la troisième périodes préparatoires, elle différait notablement pour les escrimeurs sélectionnés et ceux de la réserve.

La charge hebdomadaire se répartissait ainsi:

lundi: 1 séance d'escrime,  
mardi: 2 séances d'escrime plus piscine,  
mercredi: 2 séances d'escrime,  
jeudi: 1 séance d'escrime,  
vendredi: 2 séances d'escrime,  
samedi - dimanche: compétition.

La durée d'un entraînement d'escrime était de 2 h à 2h 30. La compétition d'entraînement du mardi se terminait toujours par 20 à 30 minutes de piscine. C'est là que les escrimeurs s'exerçaient aux manœuvres tactiques employées devant leurs adversaires au cours des compétitions (9). Les exercices tactiques figuraient d'abord au programme des leçons individuelles et ce n'est qu'après qu'ils ont été appliqués en compétition nationale, puis à la coupe du monde (10, 1). En complément des deux compétitions d'entraînement de la semaine, les escrimeurs exécutaient les autres jours des exercices conventionnels, assauts méthodiques ou libres en leçon individuelle. Au cours des assauts systématiques les deux escrimeurs effectuaient des tâches techniques ou des tactiques bien définies, au cours de l'escrime libre, ils s'affrontaient sans restriction aucune. En 1982 et 1983 quand nous avons été obligés de partir le vendredi après-midi, l'entraînement avait lieu dans la matinée. Si notre départ était pour samedi ou des compétitions le dimanche, naturellement le vendredi nous avons maintenu notre séance habituelle.

### **Objectif de l'étude; hypothèses**

#### *Les questions*

- Est-ce qu'il y avait des différences de préparation ou de charges d'entraînement et de compétition entre les escrimeurs sélectionnés membres de l'équipe et ceux qui ne l'étaient pas ?
- Quels facteurs influençaient le plus les résultats obtenus aux compétitions principales, CM et JO:
  - les leçons individuelles?
  - le le nombre des matches?
  - le nombre des touches données?
  - les victoires remportées ou leur proportion?
- Comment et à quel point les résultats obtenus au cours des compétitions sélectives de la coupe du monde "annonçaient" les résultats et classements atteints aux CM ou aux JO?
- Est-ce que tous les tournois de la coupe du monde ont servi à préparer les compétitions principales?

**Les hypothèses**

1. Moins de différences que de ressemblances.
2. Facteurs de même poids, exerçant tous une influence positive.
3. Importance croissante annuelle en fonction du temps écoulé.
4. Utilité croissante annuelle en fonction du temps écoulé.

**Méthode de mesure des facteurs documentés**

Sur 10 années et à raison de 42 semaines par an, j'ai mesuré la charge demandée aux athlètes pour 8 entraînements hebdomadaires. Dans le journal d'entraînement, j'ai fixé 5 données et leur distribution dans le temps (année, période: 3 fois 14 semaines, dates des tournois de la coupe du monde, ainsi que des semaines et des compétitions). Voici les facteurs:

**Td:** nombre des touches données,

**V:** nombre des victoires,

**L:** nombre des leçons individuelles reçues,

**M:** nombre des matches,

**P:** proportion des victoires, calculée en divisant V par M, donnée en pourcentage.

Toutes les données, P excepté, mesurent la charge d'entraînement. P mesure la performance. Les données, soigneusement notées dans le journal d'entraînement, peuvent être facilement contrôlées (*tableau No.1*).

**Tableau 1.**

<b>Variables employées et leurs signes</b>										
Périodes	1.	2.	3.	4.	5.	6.	7.	8.	1-7	1-8
Compétitions	Nancy	Moscou	Budapest	Hanovre	New York	Varsovie	Padoue	CM/JO	Total	Total
Nombre de leçons	L1	L2	L3	L4	L5	L6	L7	L8	L <sub>1-7</sub>	L
Nombre de matches	M1	M2	M3	M4	M5	M6	M7	M8	M <sub>1-7</sub>	M
Nombre de touches	Td1	Td2	Td3	Td4	Td5	Td6	Td7	Td8	Td <sub>1-7</sub>	Td
Nombre de victoires	V1	V2	V3	V4	V5	V6	V7	V8	V <sub>1-7</sub>	V
Proportion de victoires	P1	P2	P3	P4	P5	P6	P7	P8	P <sub>1-7</sub>	p
Points de classement	S1	S2	S3	S4	S5	S6	S7	S8		

Abréviations: CM = Championnat du Monde; JO = Jeux Olympique

Les colonnes numérotées contiennent les valeurs des 5 facteurs principaux mesurés au cours de l'époque en question. Dans l'avant-dernière colonne se trouvent les facteurs totalisant les valeurs des facteurs mesurés durant les 7 premières périodes (exemple:  $M_{1-7} = M1 \text{ à } M7$ , par contre  $P_{1-7} = P1 \times M1 + \dots + P7 \times M7/M_{1-7}$ ). Dans la dernière colonne se trouve la somme des valeurs des facteurs mesurés pour les 8 étapes (exemple:  $M = M1 + \dots + M8 = M_{1-7} + M8$ ).

Pour les huit escrimeurs sélectionnés ceci a été complété par les facteurs mesurant les classements obtenus aux compétitions principales.

De tous les facteurs mesurant les charges (M, V, Td, L), c'était sans doute les leçons individuelles qui se montraient les plus efficaces dans le développement qualitatif des participants. Ces leçons comportent des exercices spéciaux et des tâches tactiques en fonction de la personnalité, du style, des dispositions naturelles des escrimeurs. Ces tâches et solutions tactiques s'avéraient cruciales dans l'affinement de quelques touches déterminant l'issue finale du combat (1).

### **Analyse statistique**

#### ***Considérations générales***

Pour toutes les analyses je me suis servi de la version 6.0 de Statistica for Windows (11). Toutes les données mesurant les charges sont du type interval (12). Pour rejeter une hypothèse nulle je choisis un degré de signification à 5%. Étant donné que pour certains facteurs la distribution des données ne satisfaisait pas à la condition d'uniformité des variances, en comparant les deux groupes j'ai utilisé au lieu de l'épreuve traditionnelle "t", l'épreuve modifiée de Welch (11).

#### ***Problèmes découlant de la nature des données, soulevés par les régressions linéaires à plusieurs variables\*\****

Notre analyse traite exclusivement des données quantitatives de charges d'entraînement et de compétition. Par conséquent, elle ne peut pas rendre compte de l'aspect qualitatif qui pourtant, détermine en réalité les caractéristiques critiques des matchs, compétitions, leçons, victoires, touches données et fait obligatoirement partie des plans d'entraînement et de compétition. Hélas aujourd'hui nous sommes encore très loin d'un concept théorique des sports qui permettrait de réunir en un seul modèle causal ces deux aspects des choses. Nous devons donc nous contenter de ce que nous sommes en mesure d'analyser avec les moyens dont nous disposons et le faire de manière à tirer de nos données autant d'informations utiles que possible.

Un but important de l'analyse a donc été de distinguer parmi tous les facteurs entrant en jeu celui ou ceux qui contribuaient en premier lieu à influencer et expliquer les résultats obtenus à la dernière compétition ou les victoires remportées pendant la dernière période de compétition.

- La première méthode consiste à appliquer la régression itérative afin de mettre à part du groupe des facteurs "prognostiques" ceux dont le coefficient

différait significativement de zéro, puis à recommencer la régression avec les variables restantes et à continuer ainsi de suite jusqu'à ce que chaque variable ait fini par avoir un coefficient significatif. Il n'y a qu'un inconvénient: le procédé oblige à faire un très grand nombre d'estimations.

- La deuxième méthode, servant à éliminer la multicollinéarité, consiste à utiliser pour l'estimation au cours de la régression au lieu de certaines variables "prognostiques" leurs résidus, épurés de la variable corrélative à elles.
- La troisième méthode sert à estimer par régression le transformé logistique de la variable P8 L'un des effets de cette transformation logistique est d'atténuer les problèmes découlant de la colinéarité. Un autre effet est qu'elle élimine une déformation éventuelle. La transformation a un inconvénient: les coefficients de régression ainsi obtenus ne peuvent pas être aussi directement interprétés que dans le cas du procédé linéaire, où le changement que subit la variable dépendante quand la valeur de la variable indépendante augmente ou décroît d'une unité, est numériquement indiqué.

## **Résultats et discussions**

### ***L'homogénéité de groupe***

Est-ce que les escrimeurs sélectionnés forment un groupe homogène avec les escrimeurs non sélectionnés? Les statistiques descriptives des variables étudiées démontrent que parmi toutes, uniquement M1 n'a pas montré une différence significative en faveur des membres sélectionnés. Il a fallu rejeter l'hypothèse du départ: que les 29 escrimeurs forment un groupe homogène, et par conséquent, il a fallu les diviser en deux groupes pour les analyses.

### ***Régression***

Les résultats de la régression où P8, indiquant l'efficacité au cours de la dernière période de la saison, figurait comme variable dépendante et L1 à L7, M1 à M7, Td1 à Td7 et P1 à P7, comme variables indépendantes, laissaient supposer que ces variables quantitatives documentées ne garantissaient pas une exactitude suffisante pour l'estimation de l'efficacité individuelle (*tableau No.2*). Selon  $R^2$  qui montre le taux de l'adaptation du modèle pour les sélectionnés, 77,2% de la variance de P8, pour les non sélectionnés, 81,5% peut être expliquée par ces variables, les erreurs standards des deux régressions étant de 6,4% et de 10,8%, exprimée en unité de mesure de la variable dépendante.

Tableau 2.

**Estimation par régression de la valeur de P8  
en employant toutes les variables**

Sélectionnés	Oui	Non
R	0.878	0.903
R <sup>2</sup>	0.772	0.815
R <sup>2</sup> corrigé	0.572	0.168
F-reg (dl1;dl2)	3.86	1.26
(dl1;dl2)	(28, 32)	(28, 8)
F-reg p<	0.000	0.388
emreg.	0.069	0.108

Symboles: R = coefficient corrélatif à plusieurs variables; R<sup>2</sup> et R<sup>2</sup> corrigé = valeur brute et valeur corrigée des coefficients déterminants à plusieurs variables; F-reg. (dl1; dl2): valeur de l'épreuve F omnibus de la régression avec les degrés de liberté (dl1; dl2); degrés de liberté de l'épreuve F; F-reg. p< = niveau de signification de l'épreuve F; emreg. = erreur moyenne de la régression

**Résultats des régressions linéaires à plusieurs variables pour les sélectionnés**

Prenant P8 comme variable dépendante, j'ai trouvé trois équations. Il est facile d'interpréter la première équation (*tableau No.3*): les variables indépendantes P1, P2, P4 et M5 exercent toutes un effet favorable sur P8. Les coefficients ne devenaient jamais négatifs (tout au plus quelquefois non significatifs). L'interprétation des coefficients des deuxième et troisième équations était bien plus compliquée et leur faculté explicative décroissait (l'indicateur R<sup>2</sup> était de 57,4% et de 54,4% manquant de plus de 10% celle de l'équation première). Les variables M et Td de la même période exerçaient un effet contraire (celui qui au cours d'un nombre égal de matchs et de compétitions a obtenu davantage en touches données, a été probablement plus efficace).

Tableau 3.

**Regressions à plusieurs variables pour estimer P8, pour les sélectionnés**

Variable	b	esb	bêta	esbêta	t(56)	p<	Toler.	Regression	Valeur
Constante	0,027	0,055			0,50	0,622		R	0,830
P2	0,365	0,098	0,363	0,098	3,71	4,8E-4	0,581	R <sup>2</sup>	0,689
P1	0,237	0,107	0,249	0,112	2,22	0,031	0,441	R <sup>2</sup> corrigé	0,666
P4	0,217	0,055	0,247	0,115	2,14	0,036	0,418	F-reg(4;56)	30,95
M5	0,001	4,9E-4	0,177	0,084	2,12	0,038	0,796	F-reg p<	1,3E-13
								emreg.	0,061

Variable	b	esb	bêta	esbêta	t(54)	p<	Toler.	Regression	Valeur
Constante	0,426	0,081			5,26	0,001		R	0,758
M2	-0,003	0,001	-1,267	0,584	-2,17	0,035	0,023	R <sup>2</sup>	0,574
Td2	0,001	2,9E-4	1,171	0,576	2,03	0,047	0,024	R <sup>2</sup> corrigé	0,527

ESCRIME: PLANIFICATION DU SUCCÈS OU PRÉPARATION DES ATHLÈTES DE HAUT NIVEAU

M1	-0,004	0,001	-1,147	0,392	-2,93	0,005	0,051	F-reg(6;54)	12,15
Td2	0,001	2,9E-4	1,171	0,576	2,03	0,047	0,024	F-reg p<	1,4E-8
Td1	0,001	2,4E-4	0,943	0,386	2,44	0,018	0,053	emreg.	0,073
P6	0,347	0,088	0,381	0,097	3,92	2,5E-4	0,833		
Td5	2,9E-4	1,2E-4	0,252	0,100	2,52	0,015	0,786		
Variable	b	esb	bêta	esbêta	t(62)	p<	Toler.	Regression	Valeur
Constant	0,184	0,064			2,87	0,006		R	0,738
e									
Td4	0,001	2,7E-4	0,661	0,313	2,11	0,039	0,082	R <sup>2</sup>	0,544
M4	-0,002	0,001	-0,596	0,307	-1,94	0,057	0,087	R <sup>2</sup> corrigé	0,515
P7	0,393	0,090	0,440	0,100	4,39	4,4E-5	0,750	F-reg(4;62)	18,49
P3	0,257	0,092	0,285	0,102	2,79	0,007	0,705	F-reg p<	4,8E-10
								emreg.	0,074

Symboles: b = valeur de la section axiale (constante de regression) et des coefficients de regression; bêta = coefficients de la regression standardisés; esb et esbêta = erreurs moyennes des coefficients de regression standardisés et non standardisés; t = épreuve de la signification des coefficients; p< = niveau de signification des coefficients de regression; Toler = tolérance; R = coefficient corrélatif à plusieurs variables; R<sup>2</sup> et R<sup>2</sup> corrigé = valeur brute et valeur corrigée du coefficient déterminant à plusieurs variables; F-reg. (d1; d2): valeur de l'épreuve F omnibus de la regression avec les degrés de liberté F-reg. p< = niveau de signification de l'épreuve F; emreg. = erreur moyenne de la regression. L'explication de la première colonne se trouve au tableau No.1.

La deuxième et la troisième équations démontrent que les données des résultats de toutes les périodes sont en corrélation positive avec celles de la dernière période. La variable P5 ne figure nulle part dans les équations parce que cette variable a exercé très peu d'effets sur P8. Les deuxième et troisième équations montrent que les variables indiquant les charges des première, deuxième et quatrième périodes de compétitions ont eu un effet plus grand sur P8 que les autres (indiquant les charges des périodes 6, 3 et 7). Autrement dit, les proportions de victoires (P1, P2, P4) des charges d'entraînement et de compétition de la préparation pour les tournois de la Coupe du Monde – Nancy(1), Moscou(2), Hanovre(4) – prédisaient les résultats des Championnats du Monde et des Jeux Olympiques en 66,6 %. En même temps, la proportion des victoires (P5) de la préparation pour la compétition de New York n'a pas influencé les résultats des Championnats du Monde et des Jeux Olympiques. Le tournoi de New York s'avérait donc presque inutile. Le P5 ne figure pas parmi les équations.

**Régressions linéaires à plusieurs variables pour les escrimeurs non sélectionnés**

Pour les non sélectionnés, j'ai trouvé également trois équations, mais leur ajustement était très peu satisfaisant: la valeur de R<sup>2</sup> était au-dessous de 50%. Contrairement au cas des escrimeurs sélectionnés, ici très peu de variables périodiques pouvaient être mises en relation avec P8; j'ai donc employé en plus des variables L<sub>1-7</sub>, M<sub>1-7</sub> et Td<sub>1-7</sub>.

Comme pour les escrimeurs sélectionnés, j'ai procédé à l'analyse des transformés logistiques des classements de la dernière période de compétition. En fin de compte, nous avons aboutis aux mêmes équations que pour P8

***Résumé des conclusions***

J'ai constaté que le travail préparatoire aux championnats du monde et aux Jeux olympiques des escrimeurs français de haut niveau était tout aussi insuffisant du point de vue d'acquisition de routine compétitive que d'entraînement. Il fallait donc y remédier. Pour pouvoir évaluer l'effet des charges nouvellement introduites, j'ai soigneusement observé et noté le nombre des leçons individuelles, des matches, des touches données et des victoires pendant dix années. Comme se manifestait une différence nettement marquée dans presque toutes les données quantitatives des charges dues aux compétitions et à l'entraînement entre les deux groupes d'escrimeurs de haut niveau, il fallait prendre à part les huit participants faisant partie de l'équipe nationale et les 21 non sélectionnés.

Pour pouvoir tirer des données autant d'informations utiles que possible, j'ai eu recours à des techniques itératives et régressives. On pouvait observer une multicollinéarité très forte entre le nombre des matches et celui des touches données, mais le nombre des leçons individuelles semblait également être trop fortement lié aux proportions de victoires de certaines périodes. La technique la plus efficace pour traiter le problème de la multicollinéarité s'avérait être l'emploi des résidus purifiés de l'effet troublant de la variance de colinéarité. Il n'était pas possible d'établir d'une manière satisfaisante, si l'autocorrélation avait ou non déformé les régressions estimées; les différences de premier ordre amenaient à une perte d'informations; les résultats tout en étant très semblables ne pouvaient pas être directement comparés aux données originales. J'ai développé plusieurs modèles pour rendre compte des relations complexes existant entre les données quantitatives étudiées et la proportion des victoires obtenues aux compétitions les plus importantes de la saison. Ces modèles ont mis à jour des effets inattendus, parfois surprenants: relations de réciprocité, influences se manifestant après un laps de temps relativement long (par exemple certains effets des leçons individuelles n'entrent en jeu qu'à la saison suivante), et finalement, mais pas en dernier lieu: l'importance très diverse des résultats des différentes tournois de la coupe du monde pour les proportions de victoires finales.

L'analyse de statistique descriptive et de régression a démontré que:

- les escrimeurs sélectionnés différaient de ceux du cadre de réserve en toutes leurs données une;
- du point de vue des championnats du monde ou des JO, ni l'utilité, ni le pouvoir pronostique des compétitions de sélection augmentaient proportionnellement au temps écoulé; les quatre premières compétitions prédisent les résultats finales en 66,6%,

- des facteurs de charge paraissant purement quantitatifs ont souvent eu des effets tout à fait indirects dont certains ne se manifestaient qu'après un temps considérable et parfois même en se contrecarrant

Par conséquent, l'examen multilatéral et approfondi de ces facteurs est non seulement justifiable, mais il peut révéler des enchaînements jusque-là restés inaperçus dont il faut tenir compte en esquissant les projets d'entraînement et des compétitions.

Le modèle ayant la meilleure accommodation pour les sélectionnés:

$$P8=0,027 + 0,237 \cdot P1 + 0,365 \cdot P2 + 0,217 \cdot P4 + 0,001 \cdot M5 \quad \pm 0,061; \text{corr.}R^2=0,666$$

Le modèle ayant la meilleure accommodation pour les membres non sélectionnés:

$$P8=0,188 + 0,488 \cdot P1 + 0,325 \cdot P7 - 0,014 \cdot L6 \quad \pm 0,084; \text{corr.}R^2=0,432$$

où

M: nombre des matches

L: nombre des leçons individuelles reçues soit aux cours de l'entraînement, soit au cours des compétitions

P: proportion des victoires= nombre des victoires divisé par le nombre des matches

Td: nombre des touches données

Le numéro qui suit le signe caractéristique des variables indique les périodes de la saison, le numéro 8 se rapporte aux périodes des Championnats du Monde et des Jeux Olympiques. Placée à droite des équations se trouve l'erreur moyenne du modèle et la valeur corrigée

*L'analyse quantitative des données de chargement a en tout cas aidé à expliquer les succès internationaux obtenus par les escrimeurs français durant la période examinée, et même au-delà. Jean François Lamour est devenu champion olympique en 1984 à Los Angeles, en 1988 à Séoul et champion du monde en 1987 à Lausanne. L'équipe du club Racing (Lamour, Guichot, Delrieu, Ducheix, Bolle) a gagné en 1990 la Coupe d'Europe des Clubs Champions. Chaque membre de l'équipe de France (Lamour, Guichot, Delrieu, Daurelle, Granger-Veyron) a obtenu une médaille ou a été finaliste aux championnats du monde ou aux jeux olympiques. Exploit unique et inouï dans l'histoire centenaire du sabre français.*

\*\*Le but de la méthode de régression multiple est moins de faire de la prédiction que de voir quelles variables indépendantes ont le plus d'influence.

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