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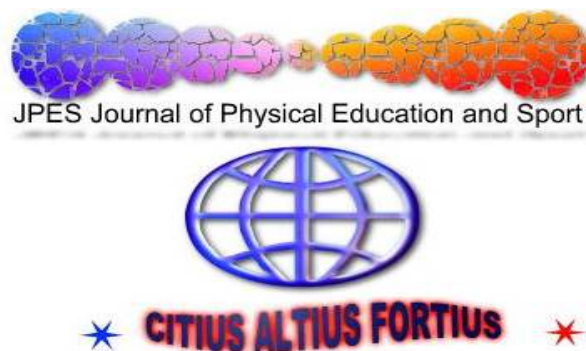
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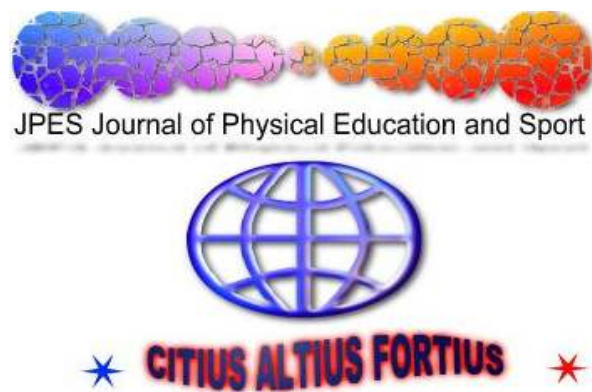
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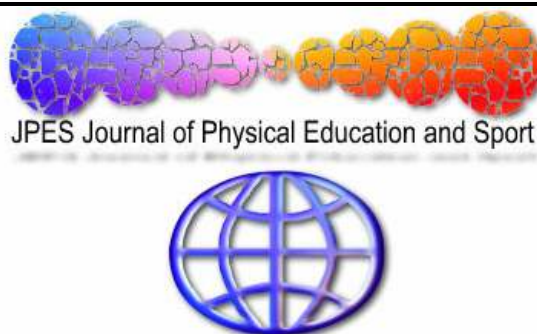
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EDITORIAL

CONCERNING THE ADVANCED SCIENCE IN HIGH PERFORMANCE SPORT¹

ADRIAN GAGEA,

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Director of Interdisciplinary Research Center,
University of Physical Education in Bucharest

KEY WORDS: Advanced science, Sport

ABSTRACT

The advanced sciences are based on the most recent huge increasing of technology and on interdisciplinary commencement of great interest topics, as top sport is considering. The main problem in top sport seems to be the obtaining high sport's performance in as short as possible time, having great efficiency and minimum risks.

The cell-engineering domain, in which the author of this paper has a modest contribution, is a means of genetic control for human performance, including sport, gene expression, molecular interactions within the cell, intracellular signalling, cell mechanics and motility etc.

The domain of *Psyche*, of controlling feelings and manifestations, is also, on the focus of top sport interest, especially for the reason that, from inside of this domain, is feasible to accede at the biological reserves unavoidable in normal conditions, but avoidable in emergency or surviving situations.

The new knowledge about energetic metabolism, about the rotation of ATP molecules, or coming out from scientifically experiments of association of nutrients or of reconsidering the recovery stimulants after effort, are providing, also, very useful information for top sport practitioners.

It is not to disregard the contribution of the new information about the human physical limits, biomechanics, tactics of doing and controls the physical effort by means of sensorial biofeedback or the performance's advantages coming from new high-minded techniques and materials of sport accessories

¹ Actualization of editorial "Despre știința avansată în sportul de performanță"
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Volumul IX, Nr. 3 (33), Septembrie 2008, 179□184

REZUMAT

DESPRE ȘTIINȚA AVANSATĂ ÎN SPORTUL DE PERFORMANȚĂ

Încercăm să semnalăm implicațiile descoperirilor științifice de avangardă și a tehnologiilor moderne în forțarea limitelor performanțelor sportive. Nu comentăm aspectele etice sau pe cele ale unor norme de protecție a sănătății în aplicațiile grăbite, dar suntem tentați să remarcăm că tendința de a obține performanțe sportive cu eficiență crescută și în timp cât mai scurt aduce inevitabil în discuție gradul de risc biologic și urmările sale pe termen lung. Se pare că sportul de performanță actual are tendința de extindere a spiritului său competițional și a formei sale spectaculare la business și la ceea ce se poate înțelege prin „fenomen social manipulabil”. De aceea, o serie de procedee experimentale se aplică deja fără cântărirea efectelor negative, cu intenția vădită de „performanță cu orice preț”. Pe de altă parte, implementările noilor cunoștințe despre procesele intime, celulare și moleculare, ale conversiei energetice musculare, ale controlului emoțional și ale reglajului stărilor psihice, asociate cu strategii flexibile și managementul profesional al pregătirii sportive individualizate au, neîndoiește, efecte benefice, reprezentând forma specifică a progresului observabil în toate domeniile vieții.

INTRODUCTION

The advanced sciences are based on the most recent huge increasing of technology and on interdisciplinary commencement of great interest topics, as top sport is considering. The main problem in top sport seems to be the obtaining high sport's performance in as short as possible time, having great efficiency and minimum risks.

The cell-engineering domain, in which the author of this paper has a modest contribution, is a means of genetic control for human performance, including sport, gene expression, molecular interactions within the cell, intracellular signalling, cell mechanics and motility etc.

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STEM CELL ENGINEERING

In the beginning, the stem cells, so called "*mother of all cells*" are pluripotent, and are able to reproduce indefinitely. These cells are able to split into more than 200 cell types, such as heart, liver and muscle and so on until the nerve cells. It is hard to believe that, in the next few years, it will be possible to replace the devastated tissues of many terrible diseases, like Parkinson, diabetes or chronic heart dysfunction, as a result of stem cell-engineering. This development gives great hope and optimism to those involved in this science. For me, having seen under the microscope how the nervous cells multiplies and develops, it is not doubt that these predictions can become reality earlier. Some years ago, culture from these cells has been grown in nutritive three-dimensional medium by nanotechnologists, protein chemists and polymers experts, now the specifics stem cells are stimulated to multiply and grow *in vivo*, using ions pumps. Long time it was supposed that in the case of a very infrequent disease of uncontrolled hypertrophy of muscles should be a genetic ground. The patients of this terrible syndrome were obliged to made frequent complicated surgical rejections for to reduce own muscular mass. In our day the defected gene was identified. Let us imagine how grotesque will looking the spectacle of sport if the idea of voluntary modifying under genetic engineering of this gene would be putting in practice in high performance sport?

The surprising beneficial effects on human health start to come not only from dethroning the DNA myth or old scientific beliefs such as, for instance, the impossible multiplication of nervous cells, but also from the innovative designs of monoclonal antibodies, so called "magic bullets". This new source of potent therapeutic drugs, no longer allergenic, due to its human origin, will revolutionize the diagnosis, the prognosis and the treatment of many diseases considered incurable as AIDS was. Finally, for most natural molecules, these "magic bullets" will force our immune system to produce antibodies.

Following the experimental models on animals, it may be possible to identify some gene responsible for sport aptitudes and attitudes in top athletes.

We should not be surprised if, due to cell-engineering, it will be possible to control the multiplying of human blood cells, eliminating the use of the (prohibited) pseudo-transfusion techniques using one's own oxygenated blood.

At the moment, it is only the cost of surgery that makes it difficult to substitute a broken meniscus with a new one grown in vitro from a cell extracted previously from the injured sportsman. The cell, reproduced and developed into a nutritive medium and three-dimensionally designed on protein support, becomes mechanical process material, and finally, a "spare part" that will not be rejected by the body. All specialists in top sports know that speed (or velocity) is a native motric skill and are sceptical of the vast improvements in an athlete's speed during the training process. In other words, the stability of an innervating regime makes the skeletal muscles predominantly slow or fast (red or white). Will cell-engineering change our classical convictions about muscle contraction speed? The above-mentioned applications, more or less actual, do not represent an inventory, and are not a list of selected applications. They serve only to provoke and generate questions or controversies.

Long time it was supposed that in the case of a very infrequent disease of uncontrolled hypertrophy of muscles should be a genetic ground. The patients of this terrible syndrome were obliged to make frequent complicated surgical rejections for to reduce own muscular mass. In our day the defected gene was identified. Let us imagine how grotesque will look the spectacle of sport if the idea of voluntary modifying under genetic engineering of this gene would be putting in practice in high performance sport?

PREDICTABLE MODELS

Some shifting are to be observed regarding the scientific methods of research; the competition between theory and practice becomes a strong and efficient collaboration, due the high powerful computers. Today, the frontiers of unknown are enquiring no more by opportunity, but conversely on the basics of modelling, looking direct to the scientific target.

A kind of modelling is using predictive logic-mathematical patterns. For instance, the predictive logic-mathematical pattern of the control of multiplication, growing or development of the cells, on which the author of these lines consider himself a specialist, are the aptitude to decide the practical solutions, the kind of exciting. Regarding this idea, we also addressing, the conviction, due to different reasons, religion included, do not accepted that the nature and the life can be copy at all, saying that we are on the same estimation. The reason is not so much the models, which can't replace the originals, indifferent of its performances, but the reason can be the fact that the eutrophy is not in our human systemic mode of thinking.

May we add that, if we attribute in our logic-mathematical models a rudimental intelligence to the cell, holographic to human intelligence, always is coming out the necessity of taking into account of a paratyping factor, different as genotyping or phenotyping ones. It is the same as, in spite of chromosomal information, of medium stimuli that produces adaptation or mutation reactions, might be necessary a strange supply, non-definite as energetically or informational entropy.

DRUGS SUPPORT

As particularly in this paper, the approach of doping topic² is different from the general one due to the fact that we are not referring to its combating, but to its prevention, putting into attention that cell engineering and hormonal sustain can be used, besides noble meaning, for the artificial amplification of sport performance (by increasing of physiological aptitudes and psychical attitudes).

From the wholesome and humanitarian desiderates of using of cell engineering to the production of oxihemoglobin conveyer blood cells for athletes, to the mutation of cells which can accelerate the re-synthesis of ATP or to the modification of the phasic-tonics contraction regime of muscle, is only a step, but a step over one deep crevasse... one ethical crevasse which diverge virtuous using of hormonal support for medical purpose from immorally using of it for instrumental doping.

Some stimulants (e.g. [caffeine](#), [methylphenidate](#) and the [amphetamines](#)) are considering doping substances, but ampakines do not seem to have unpleasant, long-lasting side effects. They are currently being investigated as potential treatment for a range of conditions involving mental disability such as [Alzheimer's disease](#), [Parkinson's disease](#) or neurological disorders as [Attention Deficit Hyperactivity Disorder](#) (ADHD), among others. Lately, study they were shown to have an effect after they had left the body, continuing to enhance learning and [memory](#). More recently developed ampakine compounds are much more potent and selective for the AMPA receptors used in sport activity, fact that becomes in the attention of sport specialists.

² Knowing that doping is both unhealthy and dangerous for the athlete as much as it is immoral and unethical; usually the discussions about doping are focuses over the records by anti-doping control and over the sanctions by applying the anti-doping code.

Well, we are trying to use the about mentioned idea to alert and prevent *on time* the family of sport friends about the possibilities of unfair destination of advanced research results like these from cell engineering, not *post factum* as it happened before with many doping substances, first find out in athletes, and after reached on the prohibits list.

It is well know that nutrition has significantly contributed to the success and outgoing improvement of performance in health and sport. Surprising is the fact that scientists are still focus their attention on new formulae of energizing nutriment. Theoretically saying, science of nutrition has not yet riches his limits; some examples are good arguments but not enough for demonstration, maybe commercial interest is involves

The feeling of tiredness, exhaustion, ache, physical and psychical uncomfortable can be signs or signals of excessive mechanical energy consummation upon a weighty physical sport effort. These states are beneficial for the body, sustaining the homeostasis effect of defence. Their complex mechanisms of action include chemical and hormonal mediators.

No far ago, some neurotransmitters, like analgesic endorphins discharged by explicit organs or tissues, where discovered. The analgesic endorphins break the homeostasis effect and can produce a euphoric sensation and ecstasy of success. Recently, scientists have hypothesized that the release of endorphins is the neurochemical cause for the feeling of pleasure. For example, a marathon runner's "high," which has been compared to the "rush" following opiate use, is the product of endorphin release³. After a physical injury, endorphins activate opiate receptors and produce an analgesic effect, alleviating severe pain. During times of emotional stress, endorphins are released in the limbic system of the brain and produce a euphoria that lessens anxiety and melancholy⁴

It can be questionable the practice of the artificial stimulation of the effect of analgesic endorphins for pushing the limits of sport's performance, but, certainly, the exogenous takings of these neurotransmitters is a doping demarche, not yet being of the "black list" and probable not easy for detecting.

In our assays for to vectorize the potential of disposable energy in physical sport effort, we have placed up a hypothetical orthogonal constituent of this potential, called "nervous energy". We have sufficient reasons to consider that analgesic endorphins diminish the symptomatic effect of the nervous component of the potential of energy.

As well as in medicine where the joining of two drugs can produce a different effect as a summation of the each solitary effect, on nutrition, the mix of two or more nutrients can be sometimes favourably or detrimentally for the efficiency of training practice. As for instance, in the trivial combination of cheese and tomatoes, besides delicious, some acids from tomatoes makes insoluble gastric the calcium from cheese, diminish the returns of ionic calcium for compensation of the calcium used in effort process.

For a good function of the muscular effectors, it is necessary some correlation and equilibrium between minerals, as for instance, between those containing calcium and those containing magnesium.

One of the top technology of testing, dosing and control of the de disequilibrium of the corporal minerals is TMA (Tissue Mineral Analysis), on which by analysis of a hairbreadth, a some weeks mineral history can be recognized. Many top athletes are using TMA for dynamic correction of the diet and mineral supplements. In some scientifically acknowledgment of nutrition for athletes is mentioned not only the mix way, but also the correctly successive management of the nutrients.

PSYCHOLOGICAL INSTRUMENTS

The high sport's performance is closely depending of efficiency of emotions control and of resistance at stress factors. There are many psychological methods of sport training on which the level of emotions are wherever controlled and the mechanism of reducing the stress effect is ameliorated. The most recent way of controlling the nervous instances involved in producing emotions and stress effects refers to sensorial feed-back; on which the inadequate reactions are vanished.

We successfully tried an acoustic feed-back of the cortical activity level, sounding the cerebral rhythms during the psychological training. After some applications, the athlete learns itself how to control the cortical activity level, and circuitously, how to reduce the supplementary emotions and exaggerated reactions at stress factors. The process can be committed to memory and used in competition, without any reactive feed-back.

Between well-known natural human being instincts, recently, was accepted also the competitive instinct. At some infrahuman species, this instinct is very evident, as for instance at very young vultures or farrows, which are fighting till to the end for food. From human being point of view, this fight is apparently very cruel, but the nature have created this instinct as a necessity for survive competition. The competitive instinct can easily confounded with well-known belligerent comportment of human male, but it is to mention that the

³ Hawkes, 1992

⁴ Rang et al., 1995

competitive instinct is something else as an effect of male hormones. Humans periodically attempt to raise the standard of their competition closer to the way nature intended, by playing sport. Then they can compete for fun, and according to rules and rituals, in a similar vein to those that are so widespread throughout nature. Of course, they often take their sport too seriously, especially when money is involved or when they allow their pitiful sense of struggle to get the better of them.

We joint to whoever scientist accept that the competitive instinct is a characteristic of a sequence from the common genome of evaluated beings. The genetic structure responsible for competitive instinct came under focus because of medical interest, but it's easily to suppose that sport interest can come soon. It is to observe that people who are bodily undersized strive to be more aggressive and to have improved spirit of competition as gigantic persons. Maybe, it is a kind of instinctive compensation using dynamics and speedy reaction against force or impressive sizes. The Galton theory of regression, meanings that the human being soma trend to middling, seems to have a scientific explanation on competitive instinct. Otherwise, the human race could come polarized; meaning that from massive pears would results massive descendents, having dominative tendency and vice-versa.

Tele-suggestion and hypnosis are considered doping instruments and are forbidden. It is not yet clear how much self-suggestion influents the high sport's performance and if self-suggestion can be harmful that need to be not allowed.

In some practice based on belief as religious conviction, the self-suggestion can have the same effect as tele-suggestion, inducing spectacular morpho-functional modifications and, much more; can contribute to cure oneself some maladies. By other hand, we have measured 5-7 times bigger isometric forces in athlete, in the case of cataleptic state (a kind of body rigidity) by voluntary hypnosis, than in normal conscious state. It is known that the liver can ensure survival with only 10% of its functional potential, that the heart of top athletes can execute 5-7 times its normal work, that normally, we use only 8-12% of our brain capacity and so on. It is to suppose that self-suggestion can also open access to the corporal reserve of energy. The true problem seems to regard to the cost and the consequence of the access to the corporal reserve of energy; taking into account the fact that nature does not give us anything without us having to pay.

In sport, the method of autogenic training use some means of self-suggestion as mental training and relaxation exercises. The mental picture of the biomechanics of sport techniques is at this moment a current practice for the autogenic training (or so calls theoretical sport grounding).

Today self-suggestion use advanced techniques of sensorial control, on which the movement is not only mental representation, but also executed and perceived at the effector's level as mechanical tensions in successive sequences. The consciously movement seems to become a means of psycho-somatic training. There are sufficient reasons for us to consider that psycho-somatic training can help a lot in the case of sport event where the executing techniques are important.

BIOMECHANICS AND MATERIALS

We have extended the biomechanical analyze to analytical biomechanics, meaning that some similarity, as for instance, the relationship between the debit of the fluids and their hydrostatic pressure, can be call up in mechanical work of an athlete.

In most sports, performance is based upon maximal speed and the time the former or a similar speed can be maintained. From a causal point of view, maximal speed is determined by the difference between the active force and the resultant of the resistive forces (i.e. net force), using as a means the personalized measure called (like in electricity) *admittance*. In our opinion, admittance (the manner in which speed depends upon force), is conditional upon several factors, as are the forces resisting movement, gravitational acceleration, duration of the action, promptness of neuro-muscular commands, the condition of the contractile effectors, the manner in which the energetic substrate is resynthesized, etc. Admittance has, as regards biomechanics, the dimension $[T \cdot M^{-1}]$ and appears as a variable coefficient or an individual constant (in case of maximal speed).

The modern technology extended from military research, as high speed video recorders of movements, today don't needs markers for to recognize a point trajectory, fact that simplify the analyze of sport technique by quickly offering the velocity, accelerations and force graphics. Any body segment or sport object can be recognized on each frame by a group of pixels having small differences of color, contrast or brightness, compared by surrounds.

Without detailing the calculation and without invoking the premises of the logical-mathematical model which connects the execution speed with the active force, we may say that *maximal speed* depends especially on the value of *active force*, the weight of the body segment or the object set into motion, the *load or the opposing forces*, the *distance* of the mechanical work, and the *an individual factor included into the admittance*. In this case the aspiration of analytical biomechanics is to find a way for to increase the admittance.

In some kind of sports are useful elastic adaptable bandages, tourniquets or malleable equipment twisted on corporal parts. A new material enclosed in these accessories; the intelligent polymers has the enquiring propriety to self-adjust on mechanical tension or temperature gradient, being named *intelligent*⁵ just because of the fact that its stretchy is variable and controllable. The intelligent polymers enlarge their aria of application from medicine to top sport.

The corporal equipment or clothes having the propriety of conducting humidity only in one way are already classics, but the materials of equipment that force the water to flood linear on its surface, without any turbulence, imitating the dolphin skin, seems to be inspirited from *science-fiction*, in the spite of the fact that, by now, some athlete or sport devices are used it. Only the expensive prices of this material make taboo, not yet enough sport or ethics rules.

We have to observe, that lately the designation of training periodization and selection of appropriate number of repetition and sets are based on short feed-back of biological reaction in sportsman. It's meaning that efficiency of sport preparation needs to enlarge the classical training team-work.

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⁵ Stimuli-responsive, "intelligent" polymers are polymers that respond with large property changes to small physical or chemical stimuli. They are also known as "smart", "stimuli-responsive", or "environmentally sensitive" polymers. These polymers can take many forms; they may be dissolved in aqueous solution, adsorbed or grafted on aqueous-solid interfaces, or cross-linked in the form of hydrogels....



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ORIENTATION ARTICLE

THE MANAGEMENT OF THE SCIENTIFIC RESEARCH PROJECT

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Abstract

In the context that the management “in spreading everywhere in the modern society” (T. Gavrilă, V. Lefter, 2002) and that is “part of the every social institution” (P. Drucker) gets a major importance concerning the elaboration and promotion of the scientific research projects from superior education. The promotion of the managerial thinking in the framework of the (multiannual) scientific research projects fulfills major roles and generates a remarkable potential impact to some essential components, having effects in the positive and decisive influence of the work processes realized in systemic and synergic context in order to achieve the goal. Starting from the previous expressed premise that the management is part of any social institution, the promotion of the managerial thinking within the framework of the scientific research project concept realized by us was reflected by the content elements that will be revealed forward. In the framework of the conceptualization phase, by the promotion of the management through objectives, there were formulated five objectives that were considered by us as necessary in order to achieve the purpose that results from the research project theme

Key words: *scientific research, management of project, managerial perspective*

The context of the research

The scientific research in the superior education represents, in the same time, a necessity of the activity specific to the knowledge improvement and a professional obligation. This can be realized through the scientific projects that are elaborated according with the market requirements in the framework of some teams that are constituted in this direction, projects that are agreed to receive financing from the structures representing the public or the private domain.

Our investigation realized on a significant scientific papers and documents elaborated by specialist from the physical education and sport superior education emphasizes two aspects (conclusions) that we consider to be significant and with impact for the future activity in this domain:

- the first, that represents a strength point, is that in the Physical Education and Sport fundamental domain there are demonstrated competencies in order to elaborate valuable specialty concepts concerning the scientific research, in concordance with the social necessities and requirements;
- the second, that represents still a weak point, is that in many situations the valuable specialty concepts are not sustained by a adequate managerial approach, context where the general valuable projects' potential is decreased and the finance chances are minimal.

The National Council of the Scientific Research from Superior Education elaborated formal and content requirements for the scientific research projects that are financed from the state budget and also criterions to evaluate the financing requirements, requirements and criterions that concern, both the scientific specialty component and the quality of the project managerial approach.

Content, methodology

From the methodological view point, our research is based on the bibliography documentation that underlined to the theme and the extrapolation of some concepts founded in the specialty literature, as well as on the case study and the experience gained within the framework of the no.5, appendices Ia, NCSRSE code 1172 project and grant (grant contract no. 35GR/2007) called “Educational strategies concerning the social integration of the minors in the reeducation centers”.

The purpose of the project was to determine the ways by which the means of the physical education and sport can be used more efficient to reform the human personality of the young institutionalized from the minors’ reeducation centers and to favoring a more quicker and efficient social insertion of them after they get out of center.

Within the framework of the project we started from the hypothesis that the access of the institutionalized children from the reeducation minors’ centers to the educational complex process and adequate to their particularities by using the physical education and sport means will activate in a grater way the educational levers, especially of the moral education and will determine an adequate social insertion after institutionalization.

From the managerial perspective we considered that the identification and using of the specific management concepts in the multiannual scientific research project will provide the fulfillment of the NCSRSE criterions will generate the increasing of the financing possibility and will represent a work instrument in the projects’ running and completion in efficiency conditions.

The documentation regarded to the project led to some concepts’ shape and activation, considered by us as being fundamental:

1. The praxiologic vision according which a well done thing is the result of a well thinking approach and that this approach can be achieved only by respecting the following trajectory: objectives – contents (activities, methods, resources, organization) – evaluation, (D. Colibaba Evuleț, 2007);
2. The managerial vision, that supposes provisional activities of organization, managing and control-evaluation, grouped in three phases: conceptualization, coordination and commensuration;
3. The conceiving and managing of the research project will realized at superior parameters if the specific methods of management by objectives, results and budget will be used in a complex and modern vision.

The achievement of the scientific research projects in the physical education and sport domain specific conditions supposes the browsing of some significant importance stages:

- the identification and concretization of the research interest domain by studying the requirements of the market, specialty and normative context the provisioned impact of the research completion;
- the elaboration of the research concept based on the conditions/criterions that are formulated by the potential founder as a scientific research project;
- the ongoing of the research project by realizing the actions that are related to the established objectives and the allocation of the necessary managerial resources;
- the research release and valorization in order to emphasize the utility and durability of the project and to open new research and knowledge horizons

Starting from the previous expressed premise that the management is part of any social institution, the promotion of the managerial thinking within the framework of the scientific research project concept realized by us was reflected by the content elements that will be revealed forward. **So, in the framework of the conceptualization phase**, by the promotion of the management through objectives, there were formulated five objectives that were considered by us as necessary in order to achieve the purpose that results from the research project theme. In order to achieve those five objectives there were identify 21 activities that were associated to the objectives as it follows: objective 1 – 4, objective 2 – 5, objective 3 – 5, objective 4 – 4, objective 5 – 3 (table 1).

Table 1. Involvement of the team members

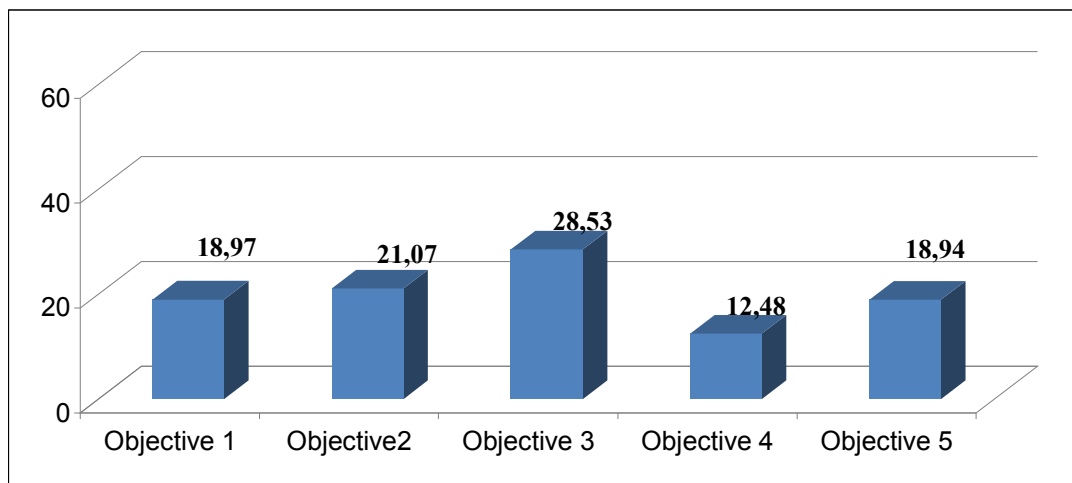
Member of the team Activities	0	1	2	3	4	5	6	7	8
1.1. Organizing the research and its resources (First year – 2007)	Yes	Yes	Yes						
1.2. Research into the specialty literature corresponding to the project's subject (First year – 2007)		Yes	Yes	Yes				Yes	
1.3. The examination of the syllabuses and of the training strategies specific to the pre-academic education (First year – 2007)		Yes				Yes	Yes		Yes
1.4. Carrying out the audit of the organizational environment submitted to the research (First year – 2007)		Yes	Yes			Yes	Yes		
1.5. Self-evaluation concerning the objective achievement (First year – 2007)	Yes	Yes	Yes	Yes					
2.1. The processing, the analysis and the interpretation of the Yesta and information resulting from the achievement of the objective 1 (First year – 2007)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2.2. The elaboration of the instructional strategy project containing curricular and extra-curricular activities of physical education and sports (First year – 2007)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2.3. The analysis and completion of the instructional strategy project (First year – 2007)	Yes	Yes		Yes		Yes			
2.4. Self-evaluation concerning the objective achievement (First year – 2007)	Yes	Yes	Yes						
3.1. Organizing the activity and providing the necessary resources in order to apply the proposed models (First year – 2007)	Yes		Yes						
3.2. Experimenting the models while carrying out the center's activities for the 1 st semester (First year – 2007)	Yes		Yes		Yes		Yes	Yes	
3.3. Self-evaluation concerning the application of the proposed strategy for the 1 st semester (First year – 2007)	Yes	Yes	Yes	Yes					
3.4. Experimenting the models while practicing the activity of the centre during the 2 nd semester (Second year – 2008)	Yes		Yes		Yes		Yes	Yes	
3.5. Gathering, registering and processing the information resulting from the application of the experimental strategy (Second year – 2008)			Yes	Yes	Yes	Yes	Yes	Yes	Yes
3.6. Self-evaluation concerning the application of the strategy (Second year – 2008)	Yes	Yes	Yes	Yes					
3.7. The valorization of the research's partial results through communication and publishing (Second year – 2008)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4.1. The optimization of the models that have been used according to the conclusions resulting from the experimental application self-evaluation (Second year – 2008)	Yes	Yes		Yes	Yes	Yes			
4.2. The elaboration of the final models concerning the curricular and extra-curricular educational-instructional strategies of physical education and sports meant to determine the favoring of the institutionalized children' re-education and social integration (Second year – 2008)	Yes	Yes	Yes				Yes	Yes	
4.3. The results valorization through the elaboration of the syllabuses for this social category (Second year – 2008)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4.4. The elaboration of the final report concerning the project achievement (Second year – 2008)	Yes	Yes							
4.5. The valorization of the research's results through scientific communications, by publishing articles and by editing a book (Second year – 2008)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

We believe that an objective can't be achieved by less than three actives and more the five. For each activity we identified the necessary expenditure types and its quantum, what led to the establishment of the project budget on the trajectory of each activity related expenditure → necessary expenditure for each objective achievement → total project expenditure on types of expenditures (table 2) The distribution of the expenditures

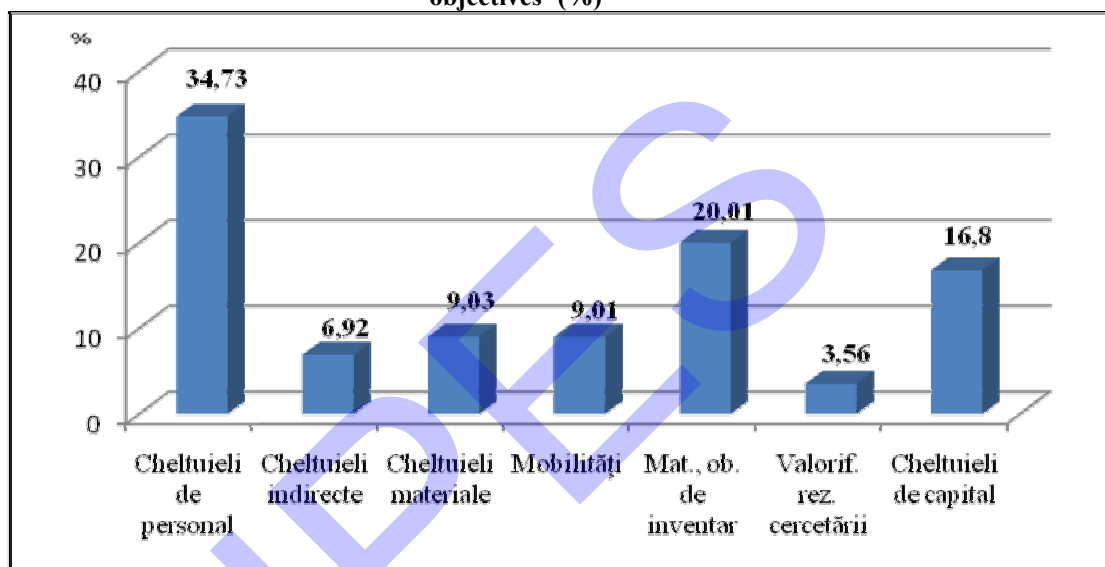
was framed between 2 – 6% to 18 limits activities and in only two cases (when there was necessary capital expenditures) they exceeded 11, respectively 15 %. The judicious distribution of the financial resources on activities generated a balance share of the expenditure for each objective achievement (graphic 1), the third objective having a bigger share because of the capital expenditure.

Table 2 Objectives and activities within the project.

Year *	Scientific objectives (Objective name)	Associated activities* *	Requested value for activities (RON)***
2007	1. The theoretical and methodological substantiation of the research	1.1. Organizing the research and its resources	17.210
		1.2. Research into the specialty literature corresponding to the project's subject	3.640
		1.3. The examination of the syllabuses and of the training strategies specific to the pre-academic education	3.590
		1.4. Carrying out the audit of the organizational environment submitted to the research	3.890
		1.5. Self-evaluation concerning the objective achievement	3.390
	2. The elaboration of the project concerning the instructional strategy	2.1. The processing, the analysis and the interpretation of the Data and information resulting from the achievement of the objective 1	3.390
		2.2. The elaboration of the instructional strategy project containing curricular and extra-curricular activities of physical education and sports	3.640
		2.3. The analysis and completion of the instructional strategy project	3.640
		2.4. Self-evaluation concerning the objective achievement	3.390
	3. Experimenting and evaluating the proposed models	3.1. Organizing the activity and providing the necessary resources in order to apply the proposed models	12.435.7
		3.2. Experimenting the models while carrying out the center's activities for the 1 st semester	5.740
		3.3. Self-evaluation concerning the application of the proposed strategy for the 1 st semester	3.350
2008	3. Experimenting and evaluating the proposed models	3.4. Experimenting the models while practicing the activity of the centre during the 2 nd semester	6.710
		3.5. Gathering, registering and processing the information resulting from the application of the experimental strategy	6.410
		3.6. Self-evaluation concerning the application of the strategy	3.110
		3.7. The valorization of the research's partial results through communication and publishing	4.710
	4. The elaboration of the final models, the project completion	4.1. The optimization of the models that have been used according to the conclusions resulting from the experimental application self-evaluation	3.110
		4.2. The elaboration of the final models concerning the curricular and extra-curricular educational-instructional strategies of physical education and sports meant to determine the favoring of the institutionalized children's re-education and social integration	5.210
		4.3. The results valorization through the elaboration of the syllabuses for this social category	4.910
		4.4. The elaboration of the final report concerning the project achievement	3.110
		4.5. The valorization of the research's results through scientific communications, by publishing articles and by editing a book	7.660



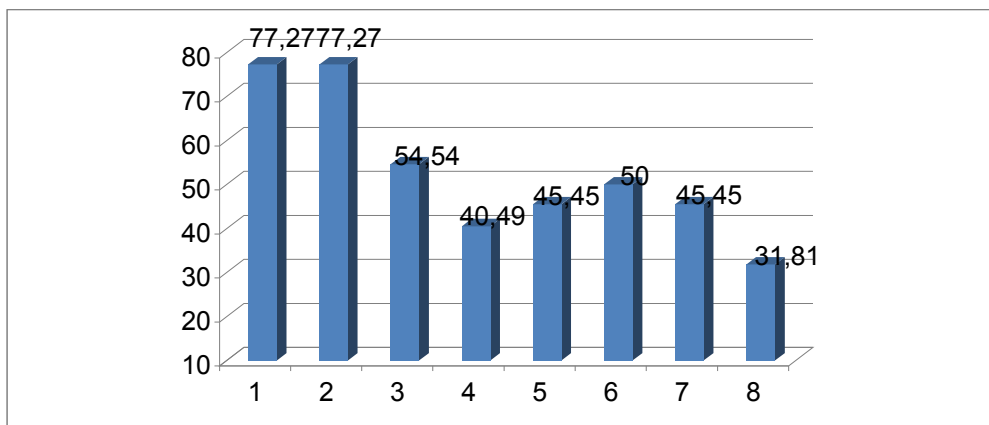
Graphic 1. The share of the expenditure that was necessary for the achievement of the research project objectives' (%)



Graphic 2. The distribution of the expenditures on expenditures types (%)

The utilization of the financial funds, grouped on 7 types of expenditures (graphic 2) was realized to assure the material support of the education – educative activities that made the object of the instructional strategy, in order to sustain the material component that was necessary the realize the research activities, as well as for the expenditures regarded to the mobility of the research members team, personal and research results recovery. From the total of 21 activities, 4 assumed 6 expenditures types (19%), 9 – 5 (42, 85%), 7 – 4 (33, 33%) and 1 – 3 (4, 72%).

The load of the research team members concerning the implication in the activities achievement, determined by their nature and team members competences (graphic 3) was a balanced one, two persons were involved in over 77 % of activities, 4 between 45 – 55 % and two between 30 and 40 %. The achievement of the Gantt diagram concerning the project activities – as a specific management technique – led to a chronological staging of the activities achievement and members for each activity. In this context it was valued the team work – 80 % of activities were achieved by 4 up to 8 members and valued the individual competences. The risk factor, inherent to every research approach, was diminished by promoting the managerial control – evaluation. The fulfillment of the activities that were associated to each objective was evaluated by double action – the self-evaluation of the members and the evaluation realized by persons designated by the project manager, the results being appreciated in direct correlation with the objectives of the research. The partial – at the end of the first research year - and final results were appreciated by the external evaluators from the Scientific Council of the University and NCSRSE, the ratings related with the activity achieved being beyond those that generated the financing.



Graphic 3. The share of the research team members' involvement in the activities achievement (%)

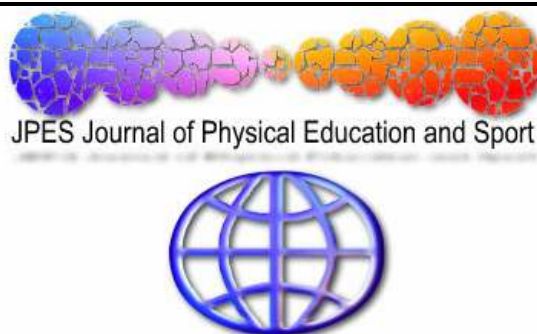
Conclusions

The obtained results after the implementation of the research project confirmed the positive impact of the instructional strategies proposed upon the behavior of the institutionalized minors on the communication, integration and team work line, respecting the game roles, assuming the responsibility, etc. these were valued by the elaboration of the physical education syllabus for the institutionalized children, book editing and communication in international scientific manifestations.

In conclusion, the promotion of the managerial thinking and the implementation of the scientific management concepts in the designing, achievement and evaluation of the scientific research projects is a vision that valorizes the project in the evaluation phase and facilitates the achievement of the activities, resources utilization, as well as the action and managing of the research team members.

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ORIGINAL RESEARCH

PACING DEVICE FOR SWIMMING. MECHANICAL CONSTRUCTION OF CONSTANT SPEED.

MESSINIS S. & PLATANOU T.

*Faculty of Physical Education and Sport Science, University of Athens***Key words:** swimming, pace, mechanical construction**Abstract**

The pace in swimming is very important because it allows swimmers to allocate their forces accordingly, and therefore a distance to travel as quickly as possible. The training pace at different swimming speeds and combinations thereof, is an important part of training before the competitions.

The definition and maintenance of the stable and swimmer specific speed is difficult to achieve and requires considerable effort and experience. To determine the desired rate of accuracy by the researchers and their coaches used till now, various audio and visual media.

However, some of these institutions did not very accurately measure the rate and not all styles of swimming, while other aspects affect the proper swimming. In this construction, a key objective is to solve the problems occurring in the previous constructions, the modern technological development of them and the adaption of the specificities of different swimming styles.

This device consists of an electro 3 / 8 of the horse, a flange, a single inverter from 3 / 8 to 1/2 of the horse, pulleys with taper Bush, flange axle, pulleys, platforms and a 52 meters cable. The assembly and operation is as follows: At the edge of the pool next to the platform is placed the base of pulleys, the electro set is connected to the inverter and the axle flange.

Precisely opposite is positioned the other base. Along the pool «moves» the cable that connects the two bases, located 150 cm above the water. A fixed point on the cable is marked with paint in order to be visible to the swimmer during backstroke swimming while for other styles we adapt a lamination at the cable vertically in the pool, above the surface a sheet of 15 cm which is painted with strong color that is visible from the athlete and will precede him. Setting the speed with inverter it starts from one end of the tank leading to the other, doing a circular motion.

The swimmer is required to follow the marked point of the cable in the backstroke or lamination in other styles. Practical applications of the use of speed regulator: 1) Determination of constant speed (rate) of the athlete, without movement problems 2) Growth rate of change in perception of the athlete. 3) Verification of proper technique 4) Training in the change of pace, planning and competition tactics.

Introduction

The aim of training is the periodic functional body charge of creating long-term operational adjustments so the swimmer to achieve the highest performance (Nikolopoulos, 2000).

The training of swimming has evolved over the years, initially aiming to improve the technical characteristics of different swimming styles and later to improve training methods focusing on energy characteristics and in particular mechanical and physiological functions of the human body.

One of the major factors for achieving high performance is the increasing power of the athlete. Presumption of these is research of Sharp et al. at 1982 on which was found significant relationships of power in swimming velocity. A protocol was implemented for the strength of hands in default speeds.

This is also the view of Birrer and Levine in 1987 under which the power of hands is major in maximizing the efficiency. Previous research on the power in swimming, made reference that the isotonic training enhances the performance of trainees (Chui, 1950) in contrast with new ones that showed significant improvement of strength by isokinetic exercises (Pipes & Wilmore, 1975 & Mitsumasa & Hiroaki, 1982).

However strength training these days apart from the various sets of training that followed, it is with the use of supports within and outside water. Thus used in swimming pool paddles (Payton, 1995), rubber attraction proposed by the researcher Kalitsis and his colleagues in 2004, tethered swimming (Hoper, 1983) and training with clothes (Choi et al., 1994 & 2000). Outside water weights are used (Platanou 1994) and swimming bench (Mitsumasa & Hiroaki, 1982). The strength is directly related to the speed which depends on the frequency and length of stroke (Craig & Pendergast, 1979).

As findings of the previous seems, the constant speed helps increase strength and at the same times the cultivation of neuromuscular synergy. Several are the methods of determining constant speed.

Methods & Procedures

The swimmers should be able to swim a distance in accordance with the time that has been requested by the coach in training or in competition, changing the rate (constant speed) of swimming. This often is not easy and requires great effort and experience.

Several investigations have been done to study effects on the rate of swimming. To determine the desired rate of accuracy by the researchers and their coaches used till now, various audio and visual media:

- 1) Walking alongside the researcher with the athlete
- 2) Acoustic instruments such as Aqua pacer which give the rhythm to swimmers emitting sounds
- 3) Small lights (pace lights) electronically adjustable, which were in the water along the pool gave the rate
- 4) Balloon which was moving along the pool tied with rope (Clinton, 1964). This was an evolution of previous construction by Abraham, 1937 and Levenstein, 1953.

The mechanical construction presented in this work is adapted for determining the constant speed in backstroke, breaststroke and butterfly style.

This device consists of an electro 3/8 of the horse, a flange, a single inverter from 3/8 to 1/2 of the horse, pulleys with taper Bush, flange axle, pulleys, platforms and a cable 52 meters F3. The assembly and operation is as follows: At the edge of the pool next to the platform is placed the base of pulleys, the electro set is connected to the inverter and the axle flange. Precisely opposite is positioned the other base.

Along the pool «moves» the cable that connects the two bases, located 150 cm above the water. A fixed point on the cable is marked with paint in order to be visible to the swimmer during backstroke swimming (fig. 1) while for other styles we adapt a lamination at the cable vertically in the pool above the surface of water and marked with waterproof paint.

Setting the speed with inverter it starts from one end of the tank leading to the other, doing a circular motion. The swimmer is required to follow the marked point of the cable in the backstroke or lamination in other styles.

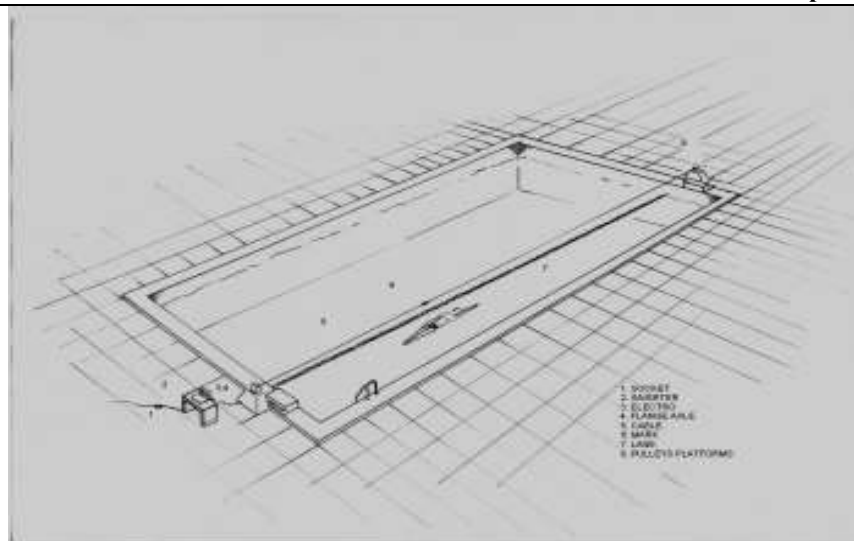


Figure 1. Mechanical construction of constant speed swimming in backstroke

Practical applications of the use of engineering design patterns: A) Training in breaststroke, butterfly and backstroke at the maximum speed of each athlete following the lamination (race conditions). B) Growth rate of change in perception of the athlete. C) Check training readiness of the athlete before the race and likely return forecast. D) Training in rate changes and planning race tactics. E) Determination of constant speed (rate) of the athlete, without movement problems F) Improve the pace of the athlete (visual stimulus) G) Verification of proper technique.

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ORIGINAL RESEARCH

STUDY REGARDING THE DYNAMICS OF THE EXPLOSIVE FORCE MANIFESTATION IN THE LOWER LIMBS, IN 8- 18 YEARS OLD BOYS

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Faculty of Movement, Sport And Health Sciences**Keywords:** correlations, take-off height, power**ABSTRACT**

The present study is an investigation of the explosive force in the lower limbs, in 8-18 years old boys. The study comprised 15 subjects, represented by the students, some of them being competitive athletes. We tried to emphasize the dynamics of the take-off height and the existent correlations between the age, weight and height parameters and the 10 indicators calculated with a specialized program. As evaluation drill for the spring, we used the “15 Jumps Test”, recorded with the “modified Miron Georgescu” sensor board. The results were recorded and analyzed with the “Microsoft Office Excel 2003” and “SPSS” (Statistical Package for Social Science) software. The conclusions of this study show that there are positive and stable correlations for each indicator represented by the average unit power, rise height, maximum height, accomplished maximum unit power, maximum possible unit power according to age, weight and height, having values between 0.514 and 0.846, thus confirming only partially the first hypothesis. Also, the average ground time and minimum ground time recorded negative values, between -0.366 and -0.233, close to -1, which indicates a reverse correlation to the age, weight and height, while the maximum unit power jump, as well as the energetic variability coefficient, has a value between 0.418 and 1.197, closer to 0, showing a lack of correlation between variable to age, weight and height. The take-off height does not depend mainly on age, thus the second hypothesis is confirmed.

I. INTRODUCTION

Considering that the height of take-off is the result of a maximum effort snapshot of a sudden enlargement, a rapid increase of force or a strong impulses and short, easy to emphasize its importance in sports-type explosive. The height of vertical separation, usually known and imprisonment meets in a more complex or simple, "can not be considered a secondary quality of speed, a simple variant of explosive speed, it came into action only in the second phase. The first phase, the slow training is of equal importance with the explosion. Added to this is "critical moment of sudden transition from one phase to another. But the essential characteristic of it is "very discontinuous structure and achieve a perfect homogeneity between the two parties completely contradictory" (Gloria Rata, 2001, p. 30).

Outside normal control samples, used by coaches and teachers to evaluate the height of take-off is also used a complex sample, called the " modified Miron Georgescu drill " it was improved by I Stupineanu, O. Ciubotaru, and P. De Hillerin, quoted by M. Epuran 2005. This test has the great advantage that is achieved with a sensor plate and the indicators present some information that might be reference data for a certain amount in the preparation.

Target-force-power relationships, specifically expressed in the report of evidence of force to the main sporting gestures make possible that detention is placed on the curve of maximum power and maximum speed, closer to power than speed, an idea supported by Wilmore and Costil, 1998 which warns that "presenting the appearance of explosive muscle strength of the force produced by movement speed.

What speed is especially an innate quality, which is improved relatively by training, especially force is one that allows the improvement of power", but the power depends on the individual's age. Speed the transition from one phase to another in the achievement of the 15 lessons offers us very important data on the power of the high jump is' reporting height of take-off from body weight "(Mihai Epuran, 2005, p. 362) and is given by how quickly the work is carried out..

II. OBJECTIVES

In the present study, ascertaining transverse type, I aimed for the following objectives:

- Knowing the height of take-off event at boys aged between 8 and 18 years, the legs;
- Highlighting the correlation that exists between indicators of assessment resulting from the assessment by the control test carried out on the modified Miron Georgescu drill as the "15 jumps", age and anthropometric indices (height, weight).

III. HYPOTHESES

Analysis of indicators drawn from the evaluation of the take-off height can highlight important issues concerning the values of the indicators. In proceeding with this study, we started from the following hypotheses:

- Between the 10 indicators drawn from the evidence of jumps and age correlations are positive;
- Height of take-off is greater in older than younger subjects and depends on the average unit power.

Analysis of results indicators can explain the relationship between strength and speed and its importance for the preparation.

IV. RESEARCH PROCEDURES AND METHODS

The **subjects** in this research are 15 male students. They have been selected out of a group of 600. Besides being students, some of them practice sports professionally, and at that particular age they had the best results regarding the vertical take-off height.

Assessment methods

For this study we recorded data regarding their: age, anthropometrical development (weight, height), the „15 jumps test” - through the modified Miron Georgescu platform. The test comprised 15 take-offs from the platform, which was connected to a computer containing the recording and analysis software.

V. RESULTS OF THE RESEARCH – ANALYSIS, INTERPRETATION AND GRAPHICAL REPRESENTATION

The data recorded in the control drills was organized and analyzed through the „Microsoft Office Excel 2003” software and the „SPSS” (Statistical Package for Social Sciences) software. The data interpretation was based on the analysis of the arithmetical mean between the maximum and minimum values and the Spearman correlation coefficient. The Spearman correlation coefficient was calculated through SPSS.

V. 1. Results of the research – analysis, interpretation and graphical representation with Microsoft Office Excel 2003

Results from Table 1 highlight the evidence of indicators between certain values that have specific meanings.

Age (A) is between 8 and 18 years with an average of 13.33, standard deviation 3.04 stresses the value of a lack of uniformity, appearance already known.

Weight (W) has an average of 48.87 kg of extreme values of 80 and 30 kg. Individual values are normal.

Height (H) presents extreme values of 1.78 m and 1.35 m and an average of 1.60 m. The individual values are normal, in terms of anthropometric development.

Average unit power (PU) recorded an average of 4.36 wat group, but values between 3.25 wat and 5.18 wat. The difference between the maximum and minimum and average and the average is 0.81 wat respectively 1.11 wat, so an appreciation of the sea. It is noted that the power of take-off does not meet the age hierarchy. Boy of 14 years and an output greater than one unit of 17 years and 18 years and the highest value recorded a performance not a sport but a student of 16 years.

The take-off height (H_{flight}) expressed in centimeters minimum value is between 0.23 cm and a maximum of 0.43 cm, with an average of 0.32 cm. The differences are quite large between the maximum and minimum, but it is observed that subjects included in the groups performance would have better values than those who are not sports performance, or that babies that age have a lower value.

Time of remaining on the ground (V_{rep.}) is the minimum value of 0.17 s and a maximum of 0.37 s, with an average group of 0.23 s. There is a large difference between the maximum and minimum time contact with soil, but that it affects the height of take-off.

Energy variability coefficient (CVE) recorded the lowest value 1.77, the highest value of 7.07 and an average of 3.92 per group. As we see large differences between minimum and maximum. It is interesting that the lowest value observed to the person making the highest average height of take-off and power unit.

Structural variability coefficient (CVS) is manifested between the value of 4.19 and 13.96 and an average of 8.43 per group.

The recorded values for the *minimum ground time (T. SOL.)* are between 0.31 and 0.14 s and an average of 0.20 s. It is noted that the average time on the ground corresponds to the best average height of take-off.

Maximum height (H_{max}) for each of the 15 subjects is between 0.26 cm and 0.47 cm. Also pointed out that the maximum height of take-off is directly proportional to the power unit against the maximum, but with average unit power in inverse relation to the duration of contact on the ground;

The *accomplished maximum unit power (RMP)* has values between 3.66 and, 5.55 wat, with an average of 4.74 wat.

The *jump accomplished with the maximum unit power (S. PRM)*, is between the second and 13 repeat. Not observed constancy in terms of achieving maximum separation after a certain number of jumps.

The *maximum possible power unit (PMP)* has values between 3.73 and 5.360 wat, with an average of 4.86 wat. It is noted that each subject is likely to improve the maximum achieved power unit, which makes us say that there is a chance that each of the subjects of inquiry can achieve a better separation height..

V. 2. Results of the research – analysis, interpretation and graphical representation with „SPSS” (Statistical Package for Social Sciences)

Statistical analysis based on correlation "Spearman correlation coefficient, the results in Table 1, is shown in Table 2 and highlights the correlations between age, height, weight and other indicators.

Rank correlation coefficient (Spearman) test the degree of correlation between 2 qualitative variables, is non-parametric alternative to "Pearson correlation coefficient, and can range between -1 and 1. Negative values close to -1 indicate an inverse correlation. A value close to 0 means correlation between variables. If non-parametric correlation coefficient values are high, close to 1 when there is correlation between variables and stability.

The values in Table 2 highlight the positive and stable correlations for each indicator represented the average unit strength, height of flight, maximum height, maximum achieved power unit, power unit relative to the maximum possible age (chart no.1), weight (chart no.2) and height (chart no.3).

Among other indicators of repetition rate, energy variability coefficient, the coefficient of variability structural minimum time on the ground, jump with the maximum achieved power unit and age, weight, height there is a correlation of variables.

Average time on the ground and the minimum time on the ground have negative values between - 0.366 and - 0.233 close to -1 which we show an inverse correlation with age, weight and height.

Maximum jumping power unit, as the coefficient of energy variability has a value between 0.418 and 1.197 so close to 0, which means to link variables to age, weight and height.

Structural variability coefficient has a value that indicates to link variables to age and height and inverse correlation to weight.

Table 2 - Correlations between age, height and weight and the spring assessment indicators

BOYS: Spearman correlation coefficient		Age		Height		Weight	
	N	Correlation Coefficient	Sig. (2-tailed)	Correlation Coefficient	Sig. (2-tailed)	Correlation Coefficient	Sig. (2-tailed)
Average unit power (PU)	15	0.746**	0.001	0.599*	0.018	0.527*	0.043
Average jump height (H.jump)	15	0.811**	0.000	0.603*	0.017	0.514*	0.050
Average ground time (V_rep)	15	-0.295	0.286	-0.319	0.246	-0.233	0.403
Energy variability coefficient (CVE)	15	0.052	0.854	0.190	0.498	0.145	0.607
Structural variability coefficient (CVS)	15	0.072	0.800	0.002	0.995	-0.182	0.516
Minimum ground time (TSOLm)	15	-0.345	0.208	-0.366	0.180	-0.233	0.403
Maximum height (HMax)	15	0.846**	0.000	0.639*	0.010	0.576*	0.025
Accomplished maximum unit power (PMr)	15	0.824**	0.000	0.621*	0.014	0.529*	0.043
Jump accomplished with the maximum unit power (S.PMr)	15	0.418	0.121	0.322	0.241	0.197	0.481
Maximum possible power unit (PMp)	15	0.822**	0.000	0.640*	0.010	0.555*	0.032
Valid N (listwise)	15	**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).					

V. CONCLUSIONS

The analysis of the results shows that:

1. correlations are positive and stable for each indicator represented the average unit power, flying height, maximum height, maximum achieved power unit, power unit relative to the maximum possible age, weight and height, with values between 0.514 and 0.846, so the first hypothesis confirmed only in part;
2. average time on the ground and the minimum time on the ground have negative values between -0.366 and -0.233 close to -1 which shows an inverse correlation with age, weight and height;
3. jump with maximum unit power, and energy variability coefficient has a value between 0.418 and 1.197 so close to 0, which means to link variables to age, weight and height;
4. structural variability coefficient has a value that indicates to link variables to age and height and inverse correlation to the weight;
5. height of take-off does not depend mainly on age, so the second hypothesis is not confirmed;
6. the mean height of flight depends on the average unit power;
7. the most powerful jump is between take-offs 2 and 13.

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Rezumat

Studiul de față este o cercetare privind manifestarea forței explozive la nivelul membrelor inferioare la băieții de 8-18 ani. Studiul a cuprins 15 subiecți reprezentați de elevi, unii dintre ei practică sportul de performanță. Am urmărit să evidențiez dinamica manifestării înălțimii de desprindere și a corelațiilor existente între parametrii de vârstă greutate și înălțime și cei de 10 indicatori calculați printr-un program special. Ca proba de evaluare a detentei am folosit „Testul celor 15 sărituri”, înregistrat cu ajutorul plăcii cu senzori „Miron Georgescu adaptată”. Rezultatele au fost prelucrate pe baza programului „Microsoft Office Excel 2003” și cu programul

de analiză statistică „SPSS” (Statistical Package for Social Sciences). Concluziile studiului evidențiază că există corelații pozitive și stabile pentru fiecare indicator reprezentat de puterea unitară medie, înălțimea de zbor, înălțimea maximă, puterea unitară maximă realizată, puterea unitară maximă posibilă raportat la vârstă, greutate și înălțime, cu valori cuprinse între 0,514 și 0,846, deci prima ipoteză se confirmă doar parțial. De asemenea media timpului pe sol și timpul minim pe sol au valori negative cuprinse între – 0,366 și – 0,233 apropiate de –1 ceea ce ne indică o corelație inversă față de vârstă, greutate și înălțime, în timp ce săritura cu putere unitară maximă, ca și coeficientul de variabilitate energetică are o valoare cuprinsă între 0,418 și 1,197 deci mai apropiată de 0, ceea ce înseamnă necorelarea variabilelor față de vârstă, greutate și înălțime. Înălțimea de desprindere nu depinde în principal de vârstă, deci a doua ipoteză nu se confirmă.

Chart 1 BOYS: Spearman correlation coefficient
Vertical take-off and indicators for the assessment of the muscular force – Age

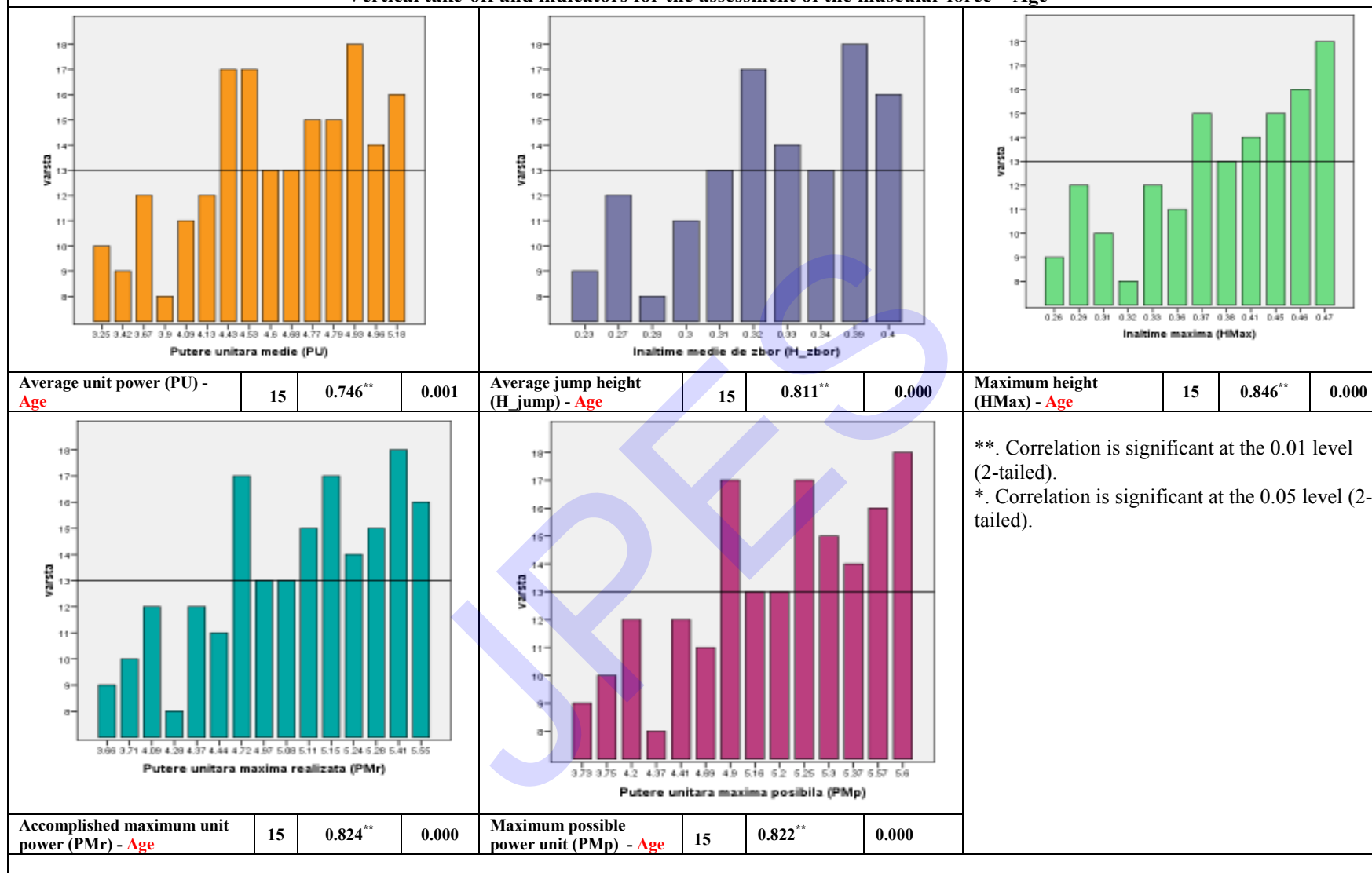


Chart 2 BOYS: Spearman correlation coefficient
Vertical take-off and indicators for the assessment of the muscular force – Height

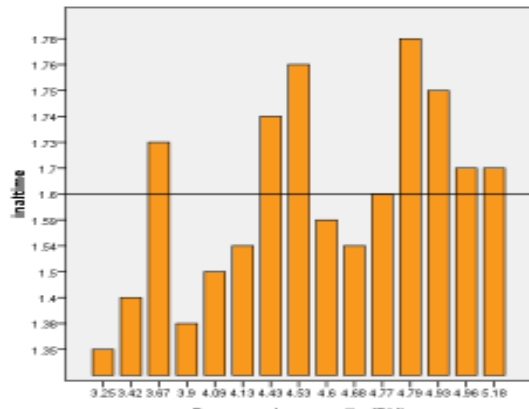
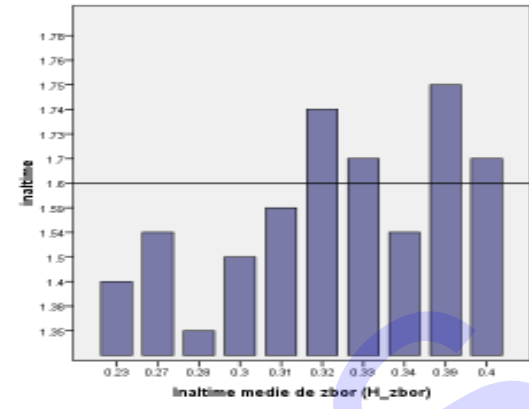
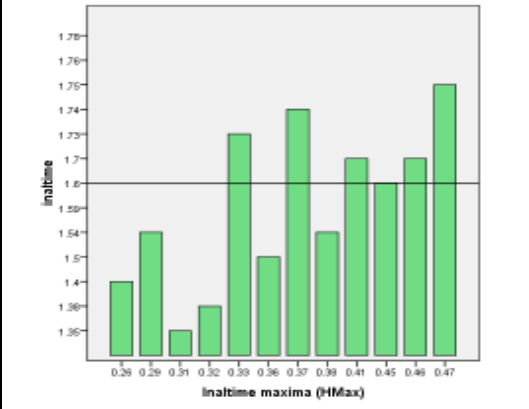
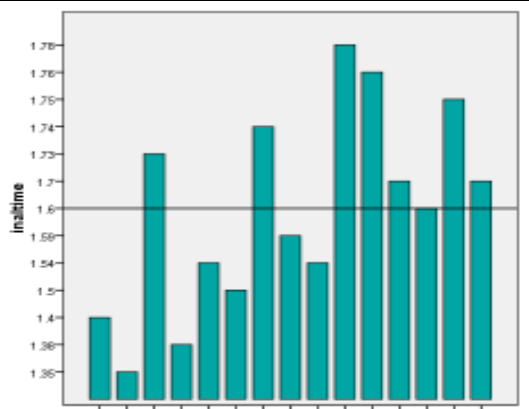
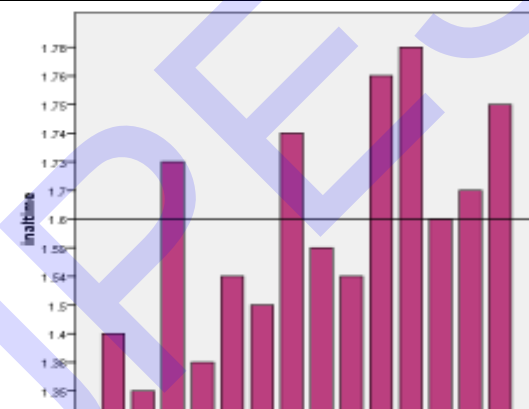
											
Average unit power (PU) - Height	15	0.599*	0.018	Average jump height (H_jump) - Height	15	0.811**	0.000	Maximum height (HMax) - Height	15	0.639*	0.010
								** . Correlation is significant at the 0.01 level (2-tailed). * . Correlation is significant at the 0.05 level (2-tailed).			
Accomplished maximum unit power (HMax) - Height	15	0.639*	0.010	Maximum possible power unit (PMp) - Height	15	0.640*	0.010				

Chart 3 BOYS: Spearman correlation coefficient
Vertical take-off and indicators for the assessment of the muscular force – Weight

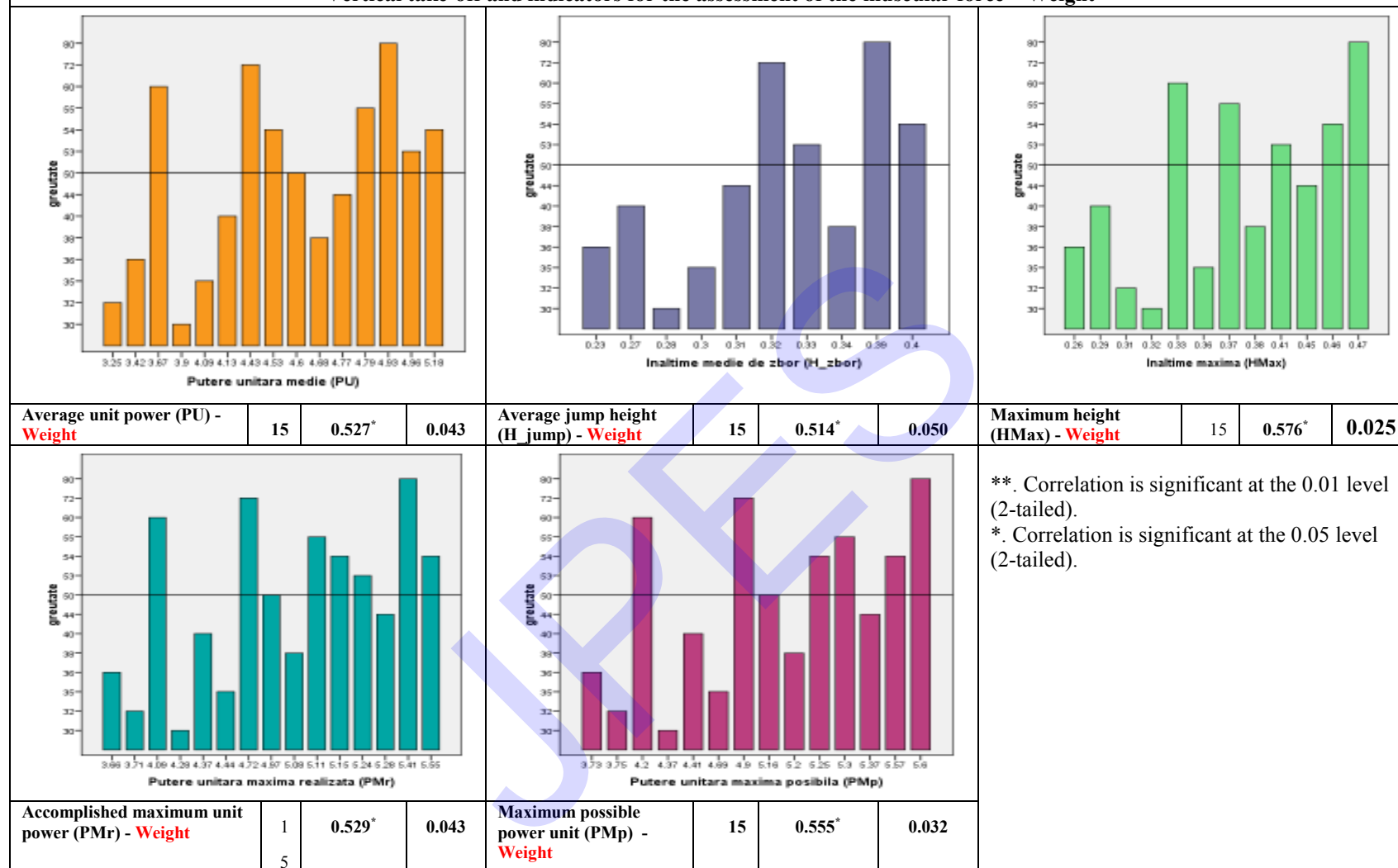
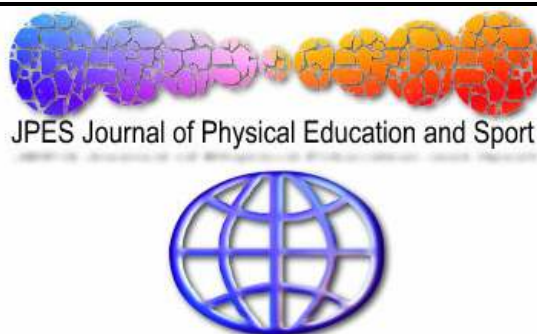


Table 1 Vertical take-off and indicators for the assessment of the muscular force in the 8 and 18 years old boys

	Unit	Initials	A.	H.	W.	(PU)	(H_jump)	(V_rep)	(CVE)	(CVS)	(TSOLm)	(HMax)	(PMr)	(S.PMr)	(PMp)
2	Ferd.	P.A.	9	1,40	36	3,42	0,23	0,24	3,57	4,19	0,22	0,26	3,66	2	3,73
3	Ferd.	U.E.	12	1,73	60	3,67	0,27	0,27	7,07	4,51	0,26	0,33	4,09	6	4,2
6	Bad O	D.M.	12	1,54	40	4,13	0,27	0,18	2,49	7,39	0,17	0,29	4,37	2	4,41
1	Oneş.J	A.R.	10	1,35	32	3,25	0,28	0,37	4,79	11,81	0,31	0,31	3,71	7	3,75
4	Ferd.	N.V.	8	1,38	30	3,9	0,28	0,23	3,05	10,49	0,21	0,32	4,28	3	4,37
5	OneşJ	G.A.	11	1,50	35	4,09	0,30	0,24	4,63	7,33	0,21	0,36	4,44	8	4,69
9	L. lib. O	B.E.	13	1,59	50	4,6	0,31	0,17	3,26	9,44	0,14	0,36	4,97	7	5,16
7	L. lib. O	P.A.	17	1,74	72	4,43	0,32	0,21	3,47	6,48	0,19	0,37	4,72	13	4,9
10	Bad O	T.A.	13	1,54	38	4,68	0,33	0,18	4,09	8,74	0,16	0,38	5,08	7	5,2
12	L. lib. O	P.S.	15	1,78	55	4,79	0,33	0,17	3,88	9,87	0,14	0,37	5,11	7	5,3
8	Ferd.	M.B.	17	1,76	54	4,53	0,34	0,23	5,50	13,96	0,19	0,41	5,15	10	5,25
14	OneşJ	C.C.	14	1,70	53	4,96	0,38	0,20	2,72	9,10	0,17	0,41	5,24	6	5,37
11	OneşJ	B.A.	15	1,60	44	4,77	0,39	0,25	3,82	4,99	0,22	0,45	5,28	10	5,37
13	Ferd.	H.B.	18	1,75	80	4,93	0,40	0,23	4,71	7,28	0,21	0,47	5,41	5	5,6
15	Ferd.	I.A.	16	1,70	54	5,18	0,43	0,23	1,77	10,86	0,20	0,46	5,55	5	5,57
Arithmetical mean			13,33	1,60	48,87	4,36	0,32	0,23	3,92	8,43	0,20	0,37	4,74	6,53	4,86
Standard deviation			3,04	0,15	14,53	0,59	0,06	0,05	1,31	2,78	0,04	0,06	0,61	3,02	0,63
Maximum value			18	1,78	80	5,18	0,43	0,37	7,07	13,96	0,31	0,47	5,55	13	5,6
Minimum value			8	1,35	30	3,25	0,23	0,17	1,77	4,19	0,14	0,26	3,66	2	3,73

Legend: Age (A), Height (H), Weight (W), Average unit power (PU), Average jump height (H_jump), Average ground time (V_rep), Energy variability coefficient (CVE), Structural variability coefficient (CVS), Minimum ground time (TSOLm), Maximum height (HMax), Accomplished maximum unit power (PMr), Jump accomplished with the maximum unit power (S.PMr), Maximum possible power unit (PMp)



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ORIGINAL RESEARCH

OPTIMIZING THE MUSCULAR TRAINING THROUGH ALTERNATED CONTRACTION REGYMES AT JUNIOR FEMALE PLAYERS I

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Introduction

The muscular training is amongst the most important factors and, in some cases, indeed the primordial ingredient of the sport training with a view to reaching high performance results, for it influences the manner in which the training is organized throughout the macro-cycle stages. It must be done organically and well balanced for each motrical aptitude solicited by the practice of the performance volleyball.

The selection of the muscular groups must be done in accordance with the technical requirements imposed by that sport branch, with the purpose of highly training the muscular groups implied in the specific movements, allowing the techno-tactical actions to be executed at high potential.

The physical training of sportsmen implies best establishing the relation in between the physical preparation, techno-tactical training and psychological training. The interdependency of the sport training factors is of major importance, as is the dominant physical training part. The need to continuously grow the specific and predominant motric qualities is one of the conditions of raising the players' efficiency. The muscular training is accomplished both by separate trainings inside the force room as through training sessions specific to volleyball, by appealing to muscle exercises. It is very important to alternate these training throughout the preparation, in order to obtain the desired effects, while the used means must be in accordance with the game pre-requisites.

When it comes to the muscular volleyball training, it is imperative that we consider the following aspects: the game specifics, the game concept, the players' specificities, the post characteristics, the game evolution tendencies, as well as optimizing the preparation.

The research purpose: is that of bettering the muscular training during the preparation process of the female junior I volleyball players, adapted to the game tasks, through elaborating and confirmation of the alternate contraction regimes programs, thus ensuring an optimal and rationalized training, with the purpose of reaching the proposed performance objectives.

The research hypothesis: by using the alternated contraction regimes to adapt the muscular training to the players' posts and morpho-functional particularities, we consider that we may determine the increase of the players' performance abilities.

Investigation methods: analysis and generalization of the special field of interest data, the measurements and tests method, the pedagogical experiment and the statistic-mathematical method.

Applied test trials:

- Throwing the medicinal ball (3kg);
- Abdomen exercises;
- Press genuflexions (1RM);
- Chest push-ups from a laid position (1RM).

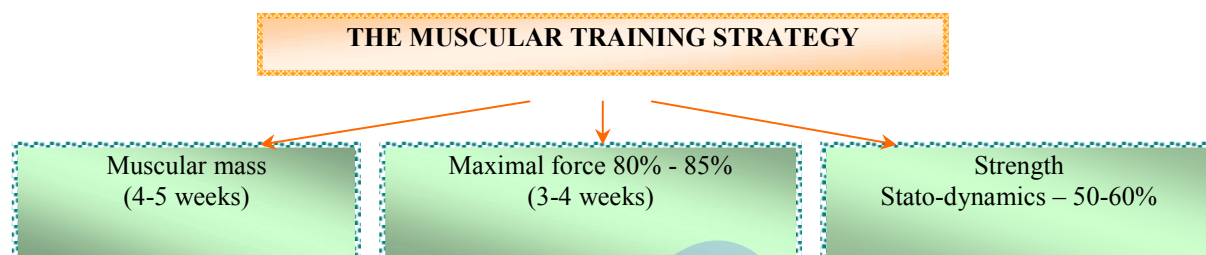
Organizing and unfolding the experiment

The pedagogical experiment we organized all throughout the June 2007 and May 2008 competition year consisted in a series of alternated (isometric-plyometric) muscular regime programs, applied to an experimental group (LPS Pitesti), whose results we compared to those of a witness group (the Craiova “Nicolae Titulescu” National College) that unfolded its activity according to the annual curricula, based on the coach proposed means.

Thus, as this very age (16-18 years), one of the main objectives from the training program was represented by the stress put on developing a solid anatomic and physiologic background.

The force-speed combination is quite decisive inside contemporary volleyball, while maximal force best benefits from speed transfers, as solicited by the game of volleyball. This is the reason why the muscular areas mostly involved in volleyball are specifically resorted to by making use of the contraction regimes and useful force indices so very much needed inside this activity.

In order to improve this aspect, the following strategy has been applied:



The muscular training strategy used for LPS Pitesti

The maximal force was obtained through the use of high loads, usually in between 80-85%. Developing the maximal force had the objective of developing the player's ability to recruit the highest number of muscular fibers, having as effect defeating resistance.

The stage that presupposes developing the players' strength through specific training including the use of loads 50-60% 1RM smaller when developing force, but also a higher execution speed and the use of medicinal balls and plyometrics. The result of this force training presupposes the increase of the reaction speed.

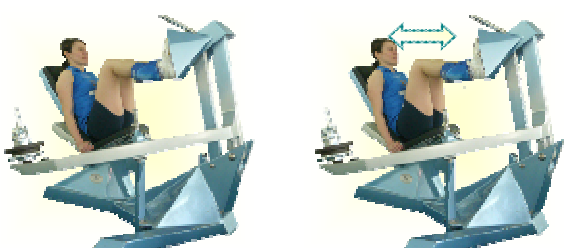
The force training was planned in correlation with other type of activities: technical-tactical exercise, speed training, resistance training. During the competition period, the trainings were meant to maintain the level of maximal force and strength reached after the preparation period, in order to facilitate obtaining performance during competitions. As for the transition period, we did organize some training, to contribute to the balanced muscular development.

We targeted the application of exercises ensuring the development of the superior muscles (improving the arms force and strength for the attack and serve ball), of the inferior ones (increase of power and explosion), of the back and abdominal muscles.

The most important aspect of the muscular training was the very choice of exercise and planning the preparation programs, for each female player shows different indices that need to be worked on in order to increase the game efficiency.

DEVELOPING THE MAXIMAL FORCE

Through alternate regimes (isometric – plyometric + isometric – plyometric)

1 The inferior limbs muscles  Dosage: 3 SERIES X 10'', 14 + 10'', 10 Pauză: 1-2 minute	2 The inferior limbs muscles  Dosage: 3 SERIES X 10'', 14 + 10'', 10 Pauză: 1-2 minute
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DEVELOPING THE SPECIFIC FORCE

Through alternate regimes (isometric – plyometric + isometric – plyometric)

2
The superior limbs muscles



Dosage: 5 SERIES X 10'', 21, 21 + 10'', 14, 14
 Pauză: 1-2 minute

Data analysis and interpretation:

The first trial subjected to the test was: “the throw of the medicinal ball”, for which the initial testing registered values of 4,70 m for the experimental group, versus 4.37 m at the witness group, while the final testing showed a 0.72 m progress of the experimental group, over a progress of 0.28 cm in the case of the witness group. The variability coefficient shows a high level of homogeneity both for the experimental, as for the witness group.

The “t” value in between the initial and final testing is of 2.373 (significant at a $p < 0,05$) for the experimental group and 1.666 (non-significant) for the witness group.

As for the game leader post, the experimental group scored a progress of 0.95m, while for the witness one, the value was of 0.25m. The value of the Student test (“t” dependant) is of 6.423 (significant $p < 0,01$) for the experimental group and 0.783 (non-significant) for the witness group.

The main players of the experimental group scored a progress of 0.70m, while the witness group showed a progress of 0.20 m. The “t” value from Fischer table is of 7.526 ($p < 0,005$) for the experimental group and of 0.651 (non-significant) for the witness group.

The table 1 graphic representation is eloquent for the results obtained by the two groups all throughout the experiment.

Table no. 1 The initial-final test results and the dynamics of the force indicator in the “ 3kg medicinal ball throw” for the experimental and witness groups

Tested trial	Group		Post/ no of players					
			Game leader n=2	Main player n=3	Secondary player n=3	Universal player n=2	Libero n=2	Team n=12
Throw of the 3kg medicinal ball (m)	Experimental group	TI	4,45	4,83	4,53	5,55	4,2	4,70
		TF	5,40	5,53	5,26	6	4,92	5,42
		Dif. med	0,95	0,70	0,73	0,45	0,72	0,72
	Witness group	TI	3,95	4,4	4,5	4,85	4,07	4,37
		TF	4,2	4,6	4,8	5,1	4,35	4,65
		Dif. med	0,25	0,2	0,3	0,25	0,28	0,28

Another trial applied inside our experiment was that of the “abdominal exercises on 30””. As it can be noticed in table 12.3.3, there was a slight difference in between the values of the two groups (the experimental group with 26.08 no of repetitions versus the witness group with 24.25 no of repetitions). In the final testing, a progress of 5.25 repetitions was registered in the case of the experiment group and of 2.91 repetitions for the witness group.

The “T” value for the experimental group is of 2.733 (significant for $p < 0,005$), while for the witness group, its value is of 2.827 (significant for $p < 0,01$). With regards to the variability coefficient, this one registers values indicating a high homogeneity both inside the experimental group (13.91%), as for the witness group (10.56%, 9.12%).

The players specialized as *game leaders* of the experimental group have scored a significant progress of 7 repetitions, while the witness group obtained a progress of only 3.5 repetitions. The value of “t” is of 7,007 (significant $p < 0,01$) for the experiment group and 3.133 (non-significant) for the witness group.

The players specialized as “leaders” obtained an increase of 5.37 repetitions for the experimental group and of 2.3 repetitions for the witness group. The value of the Student test is of 5.410 (significant for $p < 0,01$) in the case of the experimental group and of 0.655 (non-significant) for the components of the witness group.

The “secondary players” of the experimental group had an arithmetic average of 30 repetitions for the initial testing, respectively of 34 repetitions for the final testing; the control group progressed from 27 to 29.3 repetitions. The value of the associated Student test is of 3.679 ($p < 0,01$) for the experimental group and of 1.134 (non-significant) for the components of the witness group.

The players specialized as “false (universal players)” of the experimental group have obtained a progress of 6 repetitions, while those from the witness group have obtained a progress of 4 repetitions. The value of “T” is of 3.671 (significant for $p < 0,05$) for the experimental group and of 2.544 (non-significant) for the witness group.

The libero players of the experimental group have obtained a progress of 4.5 repetitions, while those of the witness group have obtained 3 repetitions. The “T” value from Fischer’s table is of 4.859 (significant $p < 0,05$) for the experiment group and of 4.275 (significant for $p < 0,01$) for the witness group. The results obtained are displayed in table no 2.

Table no2. The results in the initial and final testing and the dynamics of the force indicator for the “abdominal 30”” at the experimental and witness groups

Tested trial	Tested group		Post/no of players					
			Game leader n=2	Main player n=3	Secondary player n=3	Universal player n=2	Libero n=2	Team n=12
Abdomen 30” (no of repetitions)	Experimental	TI	21	25,66	30	26	26	26,08
		TF	28	31	34	32	30,5	31,33
		Dif. med	7	5,34	4	6	4,5	5,25
	The witness	TI	21	25,66	27	25,5	23,5	24,25
		TF	24,5	25,6	29,3	29,5	26,5	27,16
		Dif. med	3,5	5,34	2,3	4	3	2,91

The “*chest push-ups from a laid position*” through which we tested the maximal arms force shows a significant progress in between the initial and final testing of 12.33 kg at the experimental group and of 2.91 kg for the witness group.

The “t” value for the experimental group is of 4.376 ($p < 0,001$), and of 1.997 (non-significant). As for the variability coefficient, it has values that indicate a high homogeneity both for the experimental group (6.13%, 7.68%), as for the witness group (6.794%, 5.682%).

The players specialized on the post of *game leader* registered a progress of 12.5 kg for the experimental group and of 1.5 kg for the witness group. The “t” value is of 8.425 ($p < 0,01$) for the experiment group and of 1.090 (non-significant) for the witness group.

The ones acting as *main players* have obtained an increase of 13.66kg for the experimental group and of 3.34 kg for the witness group. The value of the Student test is of 10.25 ($p < 0,001$) for the experimental group and of 1.211 (non-significant) for the witness group.

The *secondary players* of the experimental group have scored an average of 38.66 kg in the initial test and respectively of 51 kg in the final testing; the control group started from 37.66 kg and reached 40.66 kg. The value of the Student test is of 8.510 ($p < 0,005$) for the experimental group and of 1.459 (non-significant) for the components of the witness group.

The players specialized as *false (universal players)* of the experimental group have obtained a progress of 12kg versus that of 3.5 kg of the witness group. The “t” value is the following one: 3.157 ($p < 0,05$) for the experimental group and 2.655 (non-significant) for the witness group.

The *libero* players of the experimental group have obtained an increase of 10.5kg, while those from the witness group have improved by 3 kg. The “t” value is of 9.433 ($p < 0,01$) for the experiment group and 2.676 (non-significant) for the witness group. The results are graphically shown in table no3.

Table no 3. The results in the initial –final testing and the dynamics of the force indicator for the “chest push-up-s from a laid position”- the experimental and witness group.

Trial	The tested group		Post/ no of players					
			Game leader n=2	Main leader n=3	Secondary player n=3	Universal player n=2	Libero n=2	Team n=12
Chest push-up-s from a laid position (kg)	The experiem	TI	41	42	38,66	39,5	36	39,58
		TF	53,5	55,66	51	51,5	46,5	51,91
		Dif. med	12,5	13,66	12,34	12	10,5	12,33
	The witness	TI	43	40,66	37,66	41	37	39,75
		TF	44,5	44	40,66	44,5	40	42,66
		Dif. med	1,5	3,34	3	3,5	3	2,91

Another trial applied with a view to testing the maximal force (1RM) of the inferior limbs was that of the press genuflexions. As can be noticed from table 12.3.4, the initial testing showed a small difference in between the values of the two groups (the experimental group: 129.3 kg versus the witness group: 131.25 kg). The final test showed a 26.53 kg progress for the experiment group and 8.75 kg in the case of the witness group.

The “t” value for the experimental group is of 4.135 ($p < 0,001$), while for the witness group, the “t” is of 2.455 ($p < 0,05$). The variability coefficient reaches values that show a great homogeneity both for the experimental (6,46%, 6,95%) and for the witness group (5,92%, 5,77%).

The players specialized as *game leaders* inside the experimental group have an average of 132,5 kg in the initial test versus 162.5 kg in the final test (30 kg progress), while the control group has an average of 132 kg in the initial testing versus 141 kg in the final trial (a9kg progress). The “T” value calculated in between the initial and final test is of 10.434 (significant for $p < 0,01$) for the experiment group and of 2.111 (non-significant) for the witness group.

The *main players* from the experimental group have registered an average of 131.66 kg for the initial testing and 155 kg for the final one. The value of the Student test, calculated in between the initial and final testing, indicates 7.006 (significant $p < 0,005$), and 4.008 for the witness group (significant $p < 0,05$).

The *secondary* experiment team players have scored a progress of 33.33 kg in between the two testings, while those from the witness group have progressed by 8.33 kg. As for the “t” value, calculated in between the initial and final test, the results are significant for both the experimental ($p < 0,005$) and the witness group ($p < 0,05$).

The *false post of universal player* of the experimental group resulted in a 22.5 kg progress sin between the initial test (137.5kg) and the final one (160kg); the witness group progressed by 9.5 kg in between the two tests. The “t” value from Fischer’s table corresponds to for the experiment group at $p < 0,01$ (9,014) and is not significant for the witness group (2,311).

The *libero* players of the experimental group obtained an arithmetic average of 113.5kg in the initial test and 135 kg in the final one. For the witness group, the initial test was scored with an average of 119.5kg versus 127 kg in the final test trial. The “t” test shows a $p < 0,005$ (14,342) for the experiment group and is non-significant for the witness group (3,009).

Table no 4. The results in the initial-final tests and the dynamics of the force indicator evolution at the "press genuflexion" trial for the experimental and the witness groups

Trial	Tested group	Post/ no of players						
			Game leader n=2	Main player n=3	Secondary player n=3	Universal player n=2	Libero n=2	Team n=12
Press genuflexions (kg)	The experime	TI	132,5	131,66	130	137,5	113,5	129,3
		TF	162,5	155	163,33	160	135	155,83
		Dif. med	30	23,34	33,33	22,5	21,5	26,53
	The witness	TI	132	133	131,33	139,5	119,5	131,25
		TF	141	142,33	139,66	149	127	140
		Dif. med	9	9,33	8,33	9,5	7,5	8,74

Following the application of the "t" test in the 4 trials specific to the indices of muscular training, we may observe that the experimental group obtained significant values for 4 out of the 4 trials (abdomen30", throw of the medicinal3kg ball, chest push-up-s from a laid position, press genuflexions), while the witness group only obtained significant values at 2 tests (abdomen 30" and press genuflexions). Table no 5 displays the scored results.

Table no 5. The results in the initial-final test and the dynamics of the evolution of the force indicator at the 4 tests, both for the experimental, as for the witness group

No.	Group		Abdomen 30'' (no of repetitions)		Throw of the medicinal 3 kg ball (m)		Chest push-up-s from a laid position (kg)		Press genuflexions (kg)	
			TI	TF	TI	TF	TI	TF	TI	TF
1.	The experimental team n=12	X	26,08	31,33	4,70	5,42	39,58	51,91	129,3	155,83
		S	3,62	2,605	0,703	0,513	2,42	3,98	8,35	10,83
		Cv	13,91%	8,31%	14,94%	9,46%	6,13%	7,68%	6,46%	6,95%
		t	3,733		2,737		4,376		4,135	
		p	significant <0,005		significant <0,05		significant <0,001		significant <0,001	
2.	The witness team n=12	X	24,25	27,16	4,37	4,65	39,75	42,66	131,25	140
		S	2,562	2,480	0,415	0,412	2,70	2,42	7,78	8,07
		Cv	10,56%	9,12%	9,49%	8,86%	6,794%	5,682%	5,929%	5,77%
		t	2,827		1,666		1,997		2,455	
		p	significant <0,01		Non-significant		Non-significant		significant <0,05	

Conclusions:

The means targeting the muscular training through alternated contraction regimes have been adapted to the objectives and requests of each preparation period.

The use of the alternated contraction regimes for training purposes lead to accomplishing a superiour muscular training of the female junior volleyball players, through improving the force indicators.

The elaborated muscular training programs have enclosed exercises that clearly set the number of repetitions and series, in function of the female player' capacity to deal with effort; the length of the pauses was also a pre-established element.

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ORIGINAL RESEARCH

A COMPARATIVE STUDY RELATING PASS BETWEEN MALE AND FEMALE BASKETBALL PLAYERS

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ABSTRACT

The main goal of this research is to examine the importance of different kind of passes through their frequency of appearance and success that male and female basketball players execute in Greek championships. The sample consisted of male and female teams of Thessaloniki - Greece. The 1st group consisted of male teams (18 from different divisions) while the 2nd group consisted of female teams (10). Data collection was based on personal observation by a research team, who registries the kind of passes that took place either from the sample team or the opposite teams. The passes that were registered are: behind the back, chest, overhead, push, hand with hand, bounce and baseball pass. The analysis of variance (Anova) in types of passes was formed, based on the factor "sex" (male-female). Specifically the comparisons were made between: a) the total number of each pass b) their successful number c) their frequency of appearance d) and their total successful percentage. The results indicate that statistically significant differences exist between the two sexes, concerning the total number, the successful number and the percentages of success for the most used passes in Greek basketball. The analysis indicates that male and female basketball players tend to use different kind of passes during activity.

Key words: basketball, pass, male, female.

INTRODUCTION

Passing, dribbling and shooting are the fundamentals of basketball in offence. Proper execution is of great importance in a basketball game, and their practice should take place in a daily basis, in order players to be more effective. (Pitino,1994).

At present time coaches give less importance in dribble than they gave last years, since the game after the 24 sec regulation becomes faster. Dribble is not the best way to move the ball fast from defense to offence. Passing now is of major importance for basketball, because is the fastest way to run the fast break (Tsamourtzis et al., 2005) or to set a play in less time. (Colbeck,1985, Wissel,1994). For some successful coaches, pass is the most important element in offense (Cousy et al., 1970) because they think that even the shot is a kind of pass towards the basket (Wooden,1980), and for some others is the second most important element of technique after the right execution of shooting (Pim,1994, Cousy,1970).

Another aspect say (Leonov et al 1990) that it's allowed to the shooter to have at least a 50% field goal percentage, but for the pass he should have the absolute 100%. Therefore, it's a status for coaches to teach their players to reward their teammates that gave them the assist to achieve a great field goal (Wooden, 1980).

A basketball assist requires court intelligence, coordination, timing and especially exquisite execution of passing ability (Melnick, 2001). Seventy five percent of successful field goals comes from passes (Miller, 1994). According to Nickols (1994) “pass could be a lost art, since many players don’t make the right and proper pass per occasion”. But still, practicing the pass must be one off the most neglected element of basketball (Wissel, 1994)

Some types of passes undergo some changes, meaning that some types of them become more important and some tend to disappear. Pass is not only the fastest way to move the ball in the court, but also the main cause of loose games, because the superficiality and mostly the disability to move right the ball leads to mistakes. (Anastasiadis, 1979). Increased number of mistakes results to increased odds of loosing a game (Ibanez et al., 2003). Immediate improvement in technical execution of the pass means reduction of mistakes, and also leads to assists that strongly contribute to a win game (Melnick, 2001, Angel et al., 2006, Manley, 1989, Trupin & Cuzens, 1989, Calipary, 1996).

On the other hand, the change of the game with great emphasis to pressure defense has made the successful field goal a very difficult situation. The zone defense is rarely used, while the main type of defense is pressure man to man and some other more complicated types of it. The main forms of offence that most of the teams use during game (pick & roll, drive to the basket and pass outside-split out) have as an essential component the right pass in the right time. (Garefis et al, 2006).

All these tend to differentiate the kind of passes that can or should be used. At the present time since pass is one of the most important elements in offense, her right technical execution is of great importance.

Passes that are usually being made during a basketball game are:

Chest pass, bounce pass with one or two hands, overhead, push pass, baseball, hand with hand, hook pass, and behind the back (Bambakoudis et al 1989, Anastasiadis, 1979, Tsitskaris, et al 1992, Neumann, 1984, Hankinson, 1979, Goodrich et al 1976). There are of course some other passes referred literally, but these are the main ones. The researchers agreed that chest pass is the basic pass during the last decades, while bounce pass, overhead, baseball and hand with hand pass are the ones that follow in percentages of use during the game.

Nowadays basketball is more athletic. The increased man to man pressure renders push pass (with one hand), of great importance and significance (Newell et al 1962, Stavropoulos et al 2001). On the other hand, behind the back passes tend to vanish as being pretty dangerous named as the main reason for steals or mistakes that all trainers trying to avoid (Wooden, 1980). The same thing happens with baseball pass, which is avoided although it can offer great show since it is used for fast breaks. Bounce pass, which is a quite slow pass and can easy be stolen, if it’s not perfectly executed (Cousy, et al 1970) does not appear also so often. It’s being used mainly when passing the post man, at zone defenses, or by players that are being trapped. (Krause, 1994).

Beyond these references (that are in relation to men’s activity) uninvestigated still remains, the attitude and relation of all these passes in correlation to women’s basketball, that presents during the last years an important quality evolution. In the past, some research have been made dealing with the differences between male and female athletes, concerning physical condition (Weesner, et al 1986, 1991, Hakkinen, 1991), or file goal percentages (White et al 1989, Elliot, 1992), or free throws (Looney, et al 1996). The control of possible relations or differences that can turn up between sexes in basketball for pass does not exist.

Therefore the purpose of this research is the multisided exploration of the use of the main passes in basketball, between male and female basketball players, in an effort to take knowledge to:

- which might be the role of each pass in nowadays basketball between the two sexes,
- which are the most used ones between them, and
- As a consequence due to their percentages of use to which coaches must give special attention in practice.

More specifically this research has the purpose to control:

- The total number of passes
- The total successful number of passes
- The successful percentage of each pass and finally
- The percentage of use of each pass.

METHODOLOGY DESCRIPTION

SAMPLE. The sample of this research composed by male and female basketball teams of Thessaloniki, Greece, divided in groups. The first one consisted of 18 male teams from different divisions, while the second group consisted of 10 female teams. A total number of 280 matches compose the sample data. (10 matches for each team).

The selection of these teams was randomly selected -cluster sampling- (Bountolos, 1990) with the aim to have as large sample as possible among the total number of Thessalonica’s teams. The discrimination of sexes in number of games was satisfactory (180 male and 100 female games).

DATA COLLECTION. This research was based on personal observation of a research group. During observation the kind of passes that took place from sample teams or from the adversary teams were registered. Registration was based on a steady protocol, quite simple, designed by the researchers and based on the kind of passes that frequently used in Greek basketball. In this protocol successful and unsuccessful passes were registered, their kind and of course the total number of them during the game. The passes in which the registration was based are: 1. behind the back pass, 2. chest pass, 3. over the head pass, 4. one hand pass, 5. hand with hand pass, 6. bounce pass and 7. baseball pass.

STATISTICAL ANALYSIS.

The elaboration of data was made with statistical package SPSS, formed by the one way analysis of variance (Anova) with a significance level of $p < .05$. Correlation's that took place were between: the total number of each pass, the successful number of each pass, the percentage of use of each pass, the total successful percentage of each pass.

RESULTS

The main descriptive elements of each pass in total are presented in tables 1 and 2.

TABLE 1. Means & St. deviations for the successful number, total number, successful percentages and percentages of use of passes for the total sample.

	Behind the back		Chess		Overhead		Push		Hand with hand		Bounce		Baseball	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
successful number	0,19	0,5	88,5	26,3	58,7	21,44	38	18,0	6,02	4,35	31,4	14,0	1,5	2,36
total number	0,25	0,58	90,2	26,7	61,4	21,79	39,7	18,5	6,11	4,34	32,6	14,4	1,8	2,62
successful percentages	73,6	33,3	97,3	1,22	95,5	1,03	95,9	1,58	98,5	1,96	96,1	1,22	84,	9,15
percentages of use	0,10	0,26	38,8	9,47	26,4	7,73	17,1	7,74	2,67	1,91	14,1	6,19	0,8	1,58

TABLE 2. Total values for the successful number, total number, successful percentages and percentages of use of passes for the total sample.

	Behind the back	Chess	Overhead	Push	Hand with hand	Bounce	Baseball	Total
successful number	109	51116	34082	22094	3499	18214	889	130003
total number	146	52325	35573	23319	3538	18961	1049	134911
Successful percentage	72%	97%	95%	94%	98%	96%	84%	96%
Percentages of use	0,01%	23,9%	26.36%	17,28%	2,62%	14%	0,77%	-

Variance analysis that was made between different kinds of passes in relation to «sex», are presented in tables 3 and 4.

TABLE 3. Means and statistical significance for passes concerning total number, and successful number of passes among sexes.

	TOTAL NUMBER		SUCCESSFUL NUMBER	
	MALE	FEMALE	MALE	FEMALE
	M	M	M	M
behind the back	0,2 ^a	0,1 ^a	0,2	0,1
chest	91,9 ^b	85,9 ^b	89,8 ^a	83,3 ^a
Overhead	59,9 ^c	65,4 ^c	57,2 ^b	62,5 ^b
push	39,4	40,4	37,7	38,7
hand with hand	6,9 ^d	3,8 ^d	6,8 ^c	3,7 ^c
bounce	36,5 ^e	22,4 ^e	35,2 ^d	21,4 ^d
baseball	1,6 ^f	2,3 ^f	1,3 ^e	1,9 ^e

a, b, c, d, e, f: statistically significant difference.

TABLE.4 Means and statistical significant for passes concerning percentages of use and successful percentages of passes among sexes.

	PERCENTAGES OF USE		SUCCESSFUL PERC. OF USE	
	MALE	FEMALE	MALE	FEMALE
	M	M	M	M
behind the back	0,1 ^a	0,06 ^a	65,7 ^a	93,7 ^a
chest	38,9	38,7	97,7 ^b	96,9 ^b
Overhead	24,9 ^b	29,1 ^b	95,3	94,8
push	16,8 ^c	17,8 ^c	95,8	95,1
hand with hand	3,0 ^d	1,7 ^d	98,2	97,8
bounce	15,7 ^e	9,9 ^e	96,1	95,5
baseball	0,7 ^f	1,1 ^f	79,3	80,5

a b,c,d,e,f: statistically significant difference.

RESULTS – DISCUSSION

Based on the data (table 1 & 2) this research confirms previous bibliography or initial thoughts referring to the differentiation in the use of various passes regardless of sex. It proved that chest passes are athletes' favorite (Wooden, 1990, Babouskin, 1991) with 38,8% percentage of use and an additional high successful percentage (97,68%). Second in preference with 26,4% percentage of use are overhead passes, with a successful percentage of 95,8%. The increasing role of push pass in today's basketball is confirmed by 17,3% percentage of use and a rather high percentage of success (94,74%). The bounce pass follows with 14% percentages of use and success 96,06%. The passes mentioned above are at the top of the list in use for the basketball players. The results confirm Stavropoulos et al, (2001), referring almost the same order of passes' importance in men teams.

The second group consists of passes that play a restricted role and tend to vanish : a) hand with hand passes with a high successful percentage 98,89% but low percentage of use (2,6%) b) baseball passes with 0,7% percentage of use and c) behind the back with 0,1% percentage of use. It is worth noting, that the success percentages are low too, with 84,74% and 74,65% respectively, showing also a weakness in the execution of these specific passes.

Maybe this is the reason for the continuous reduction of their appearance.

The interpretation of the results of the statistical analysis that came out of the discrimination of passes based on sex lead to some interesting thoughts.

As far as it concerns the total number, the total successful number and the percentages of use in most of the passes among male and female statistical significant differences are present.

Concerning the total number of passes, it is interesting to mention that female teams have bigger values for overhead and baseball passes in relation to male teams where statistically significant difference appear ($p=0.001<0.05$ & $p=0.006<0.05$ respectively). A certain predisposition of the female athletes to use quite often the overhead pass can be assumed. According to Wissel (1994), overhead pass is usually used by starting a fast break, or at zone press defenses at full court. This pass is quite easy in technical execution but has the weakness that the athlete who makes it, isn't in the right position to shot to the basket. This probably means that either not all the female athletes are good in offense, or they use the zone defense a lot during their games, that is the most likely to happen.

Baseball passes appear in high percentages too, assuming that females teams don't return quickly enough to their defense area, since only in certain occasions that pass can happen (fast break). That can also prove in a way, the difference in physical condition that surely exists among male and female teams.

On the other hand men proved to be more spectacular during their game because they appear to have higher values at behind the back passes ($p=0.009<0.05$). A pass that can be used mainly in fast break situations and it is enormously hazardous, because of its difficulty in execution.

Men are using also in greater numbers chest ($p=0.016<0.05$) and bounce pass ($p=0.000<0.05$). As far as it concerns chest pass (that is the main form of passing), it seems that male players are more patient in offence and consequently to passing activity. It's being said (Hurley, 1994, Colbeck, 1985, Wissel, 1994), that a team that makes up to four passes before it makes a shot, has better probabilities in having a good offence.

In addition bounce passes are good for show time (preferably in men's game), but present difficulty in execution because it's a quite slow pass and bad execution can be the cause for mistakes. It's more reasonable to be used by male teams, since they use this pass for their main offensive moves (pick and roll or low post passing), and they have the technical ability to execute it without mistakes. According to Brown (1995) and

Papadimitriou et al.,(2000) “good things can happen to your offence if you have good passers that can pass the ball to the post”.

The 1st group (male) also present statistical difference in relation to the 2nd group (female) in hand with hand passes($p=0.000<.05$) The high values of this particular pass are mainly the result of the “hand-of” move as a form of play especially the last few years. Despite the fact that this move can cause trap troubles, the high ability level of athletes minimize such a probability, but it can be used by both sexes.

And of course it’s an interesting result that push pass, doesn’t present statistically significant difference among the two different groups. That probably means that coaches of both sexes, give great credibility in the right execution of this particular pass at all levels (divisions), with a simultaneously reduction of mistakes.

As far as it concerns the variable “successful number of passes”, the results support even more the above mentioned. Behind the back passes and push passes present no statistical significant difference. Even though men look like they prefer to make behind the back passes in their game more than females, almost equal number of successful passes is registered for both sexes. The statistical significant difference for chest, bounce and hand with hand passes are in favour to men revealing the general picture of the way they play. That means that they are very patient in offence in relation to women, they pass the ball to the post even more and they use the hand off movement a lot more in relation to women.

Women use a lot more the zone defences and their game is characterized by more fast break situations, that is why they use more the overhead and the baseball passes.

Concerning the variable of “percentages of use”, all registered passes present statistically significant difference, except chest pass. Push passes ($p=0.000<.05$), hand with hand passes ($p=0.013<.05$) and behind the back passes ($p=0.007<.05$) present higher values for the male teams confirming previous thoughts. Overhead pass ($p=0.001<.05$), as it has already mentioned for total number, present high percentage for female teams, while proportionally high values for the same group present for baseball passes too ($p=0.003<.05$).

Of special interest in this specific analysis, is the statistically significant difference that exists for push pass ($p=0.000<.05$) with higher values for the female teams. Despite the fact that this difference isn’t big enough, the high defensive pressure of the male teams (theoretically bigger than in women’s basketball) would lead to the thought that this kind of pass, should be used in bigger number by males. But it appears that this specific pass has the same importance-perhaps bigger- for women’s basketball and so we must reevaluate the thought concerning low tension in female activity. In the past (5 to 6 years ago), ball size could be a restricted factor for the use of push pass at women’s basketball, since they use in Greece the same ball as men did. Female players tend to avoid that kind of pass, because they didn’t feel safe about its technical execution. Since this rule changed and women use now balls no 6, push pass is being used from both sexes with same frequency.

Based on the analysis of variance for successful percentages, appeared that only behind the back passes ($p=0.000<.05$) and chest passes ($p=0.000<.05$) present statistically significant difference.

Great interest presents the big difference among the two groups, were behind the back pass presents values in favour of women, confirming previous thought that men despite the fact that they are font of making spectacular actions in their game, they are not effective enough. Controversial is the situation with chest pass, where higher successful percentages present for male teams. This result is very important since this pass is the most frequent one in basketball. Therefore, male basketball players are more reliable to their passes, even though the differences at mean values are minor. In addition successful percentages of chest passes for both sexes considered to be high (over 95%).

Either through general values for both sexes or through statistical analysis, new elements arise concerning the pass in basketball. Surely chest pass still keeps the main part in activity, concerning sexes. Overhead pass is also very important, with greater popularity at female activity.

But the new tendency in today’s basketball appears along with the high levels of appearance for push pass with 17,3% percentage of use. The use of this specific pass is almost equal at both sexes.

Bounce pass still remains popular, especially for men despite the fact that it is characterized slow and can easily be stolen by intelligent players. But surely its appearance is a «must» in specific cases of offence. Special attention must be given, based on the low levels of appearance and success at hand with hand pass (we can see them especially from men), baseball pass (we can see them mainly in female basketball because of their physical condition) and behind the back pass (appeared almost exclusively in male athletes).

They are passes with low levels of appearance and success and here comes the question, if and how much training time must be spent for their practice.

CONCLUSION

As a proposal based on the above, coaches should keep on giving great importance in practicing chest and overhead pass, because basketball players used them a lot and with high successful percentages. Special attention should be given to push pass that constitutes a new important solution for pressure defence, while limited must be the practice time spent for bounce and hand with hand passes.

A question still remain, about which must be coaches' attitude towards baseball and behind the back passes because, even though they offer great show, they set victory at risk, something that every coach is trying to avoid.

Perhaps it should be better, that these kinds of passes are allowed to be executed only by players with extensive ability, limiting the mistake probabilities.

Based on the fact that the number of surveys dealing with the importance that each pass can play for the game is extremely small, indispensable and very important is further investigation of this sector, if coaches are willing to follow scientifically the evolution of basketball.

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ORIGINAL RESEARCH

TRAINING STRATEGY DEVELOPMENT OF EXPLOSIVE STRENGTH IN VOLLEYBALL

Marian Crețu, PhD¹ Larisa Vladu, PhD²^{1,2}The University of Pitești, Romania**Key words:** *muscular training, volley ball, izometrics, plyometric..***Abstract**

The muscular training is one of the most important factors and in some cases the most important admixture of sport training, with a view to reaching high performances, influencing the way the preparation is undergone. This training must be completed on a uniformly and balanced basis for each of the motric aptitudes required by the performance sport. The purpose of this paper is that of improving the muscular preparation by introducing alternate contracts schemes inside the training of the volley players (16-18 years).

Introduction

At the level of the high performance teams we notice an acceleration of the game rhythm, an increase of the number of attack stimulations, and a modification of the attack allotment over the net, with the purpose of increasing the incertitude degree and preventing the efficient organization of the opposite defense. One also notices the increase of the ball force which becomes more and more a team's weapon of attack.

The actual volley game is characterized by the increase of the execution speed and default of the reaction speed, which asks for the more intense training into effort of the solicited segments and of the whole body, as well as **the increase of the explosive force**. One other improvement is that of the complexity and variety of the technical and tactical actions, which led to the shortening of the pauses between the game phases, the increase of the effort intensity and to a limitation of the recovery time. The metabolic substratum of the effort is especially the anaerobe, alternative for short periods with the aerobe one. The locomotive apparatus is constantly solicited at the lower and higher level. The cardio-vascular apparatus solicitation is medium, with the exception of the submaximal intensity effort phases. The respiratory function is very much solicited all through the game; in the disputed game phases the organism can contract a pretty high oxygen need.

For the **performance** level (juniors), the strategic objective is centered on: improvement of the game actions which are integrated to the collective tactics and subordinated to the efficiency requests of competitions, doubled by the necessity of accomplishing a high level of **specific physical and psychical training**.

The volley instruction must be realized as a specialized process of developing and forming the player's personality, acting towards the goal of a maximal performance capacity, taken into consideration both as a whole and per its biological, technical and tactical, motrical, psychological and theoretical components.

The muscular development into a homogenous form, without disequilibrium encumbering the ulterior preparation and sport performance is needed in order to form players. Attention must be focused especially on developing the great muscular groups, while the force training must be gradually introduced into the preparation,

first making use of the exercises based on one's body weight, then facile exercises with medicinal balls, weight exercises, and ending with exercises specific to the practiced sport area, ensuring a high competitive level..

The physical preparation represents a determined structural side of the sport training inside the game of volley ball and an important content factor conditioning the technical-tactical level and the performance capacity. The more and more obvious specificity advanced through the biomechanical structures appropriated to the trial, game, influencing means, but also through the degree of the respective physical and psychical effort, is conclusively oriented towards developing the motric qualities specific to the volley game.

Measuring and evaluating the female sportive neuro-muscular qualities in the explosive effort, by the intermediary of simple, non-specific movements, the vertical jump, may orient the muscular training both in the force-speed relation as in the general control of the movement phases for the inferior level. The important parameters investigated are the following: the height of the weight center, as a consequence of the impulsion projection by a maximal singular effort or by using the elastic muscular component and the take-off, or the average of the heights obtained by repeatedly jumps under effort conditions, as a motric action which, due to its form, is a part of the contest exercises of basic volley techniques an essential game phases (Bompa T. 2002)

Hypothesis: taking into consideration the predetermined role of the muscular preparation in defining the physical training for female Volley players, we presuppose that by applying the alternate regimes with a view to developing the specific force, we create the premises of a more complex preparation if compared with the usual methods applied by trainers.

Methods and Instruments

In order to evaluate the junior female sport performances, the **tests method** was used, by making use of the **Bosco Protocol**, applied on the force measuring platform Quattro Jump tip Kistler 9290AD.

Other investigation methods we appealed to were: the analysis and special field of literature data generalization, the pedagogical experiment, the statistic mathematical method.

Table 1 The Bosco Protocol evaluates 6 different jump types and calculates a variety of [parameters](#):

	Designation	Jump Type	Description
I	SJ	Squat Jump	Single jump starting from knees bent at 90 degrees
	SJbw	Squat Jump + Body Weight	Squat jump with an additional load of up to one body weight
II	CMJ	Countermovement Jump	Single jump starting with straight legs with a natural flexion before takeoff
	CJbref	Continuous Jump Bent Legs Reference	Series of 5 jumps with bent knees, used as reference to compare with CJb (15..60s)
III	CJs	Cont. Jump straight leg	Series of 5 jumps with straight knees
IV	CJb	Cont. Jump Bent Legs	Series of 15..60s jumping with knees bent

In order to test the force of the inferior limbs, we used in our paper *the platform of force measurement „Quattro Jump”*, accompanied by five of the six tests of the protocol:

Protocolul Bosco can evaluate the following by its components:

- Explosivity tests, detachment force, non –pliometrical SJ and pliometrical CMJ
- Hip force tests, CJbref, CJb
- Reactivity tests, CJs
- Additional tests SJBody weight SJbw, by use of the body weight

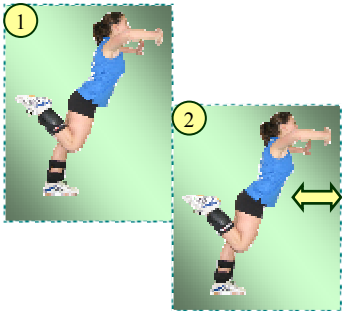
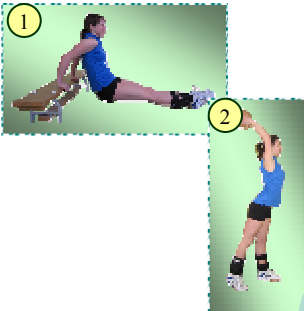
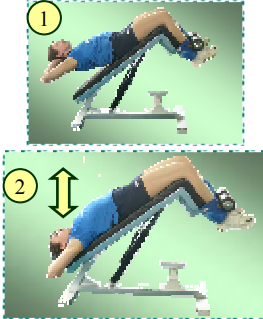
Sample: The experiment took place in the sport gymnasium of the National Highschool Alexandru Dima and at the localization of the Physical Education and Sport Faculty of Pitești, the selected group being the volley ball team of juniour females I, LPS Pitești, participant in the National Volley ball Championship. The lot is formed of 12 female players and is part of the LPS Pitești Sporting Club.

Procedure

The experimental investigation unfolded during the 15th of February 2008 – 15th of June 2008 period. It began with having the female players take 5 trials, then a training schedule was elaborated and used during their preparation.

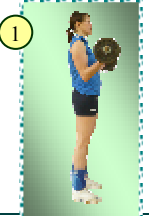
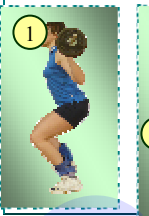
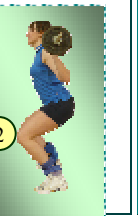
PROGRAMME 1

Table 6

A TYPICAL SESSION OF GENERAL MUSCULAR PROGRESS– by alternating the contraction regymes (isometric-plyometric)					
The warm-up	The superiour limbs muscles		The inferiour limbs muscles		The Abdominal muscles
					
Description: Moderate running.	Description: 1. From one leg standing and having the other one bent, athwart to the wall, arms bending and maintained isometrics (same exercise with the hold of the other leg against the wall). 2. From standing on one leg and having the other one bent, push-up fall (with wall hold) with the body at 45° and come-back to the starting position by pushing.	Description: 1. From standing backwards to the support gymnastics bench, backwards hold. Arms bending and maintained isometrics. 2. From standing with the left foot forward, the medicinal ball at hand (3 kg), ball throws to the wall.	Description: 1. From tip-standing position, legs apart, maintained isometrics. 2. Jumping on the gymnastics box with two legs.	Description: 1. Maintained semiflexed, legs bent at 90°. 2. Lateral jumps on two legs on the gymnastics box.	Description: 1. Lifting the body at 45° and maintained isometrics from a down and backwards position on an oblique surface, head down also. 2. Fast body lifting and come back from a down and backwards position on an oblique surface, head down also.
Dosage: 5 X 50-60 m	Dosage: 10'' isometrics, 14 of arms stretching and bending + 10'' isometrics, 14 of arms stretching and bending X 3-5 SERIES	Dosage: 15'' isometrics, 21 ball throws to the wall + 15'' isometrics, 21 ball throws to the wall X 3-5 SERIES	Dosage: 10'' isometrics, 7 jumps (40 cm) + 10'' isometrics, 7 jumps (40 cm) X 3 SERIES	Dosage: 10'' isometrics, 7 jumps (40 cm) + 10'' isometrics, 7 jumps (40 cm) X 3 SERIES	Dosage: 10'' isometrics, 14 lifts + 10'' isometrics, 14 lifts X 3 SERIES
Pause: 4 seconds	Pause: 2 minutes after each session	Pause: 1 minute and 30 seconds	Pause: 1 minute and 30 sec	Pause: 1 minute and 30 sec	Pause: 1 minute and 30 sec
Methodical indications: The warm-up must be complete and thus put together on a muscular and articular basis as to raise up to the intensity of the session to come.	Methodical indications: The height of the fall must be chosen in function of the muscular force of the superiour part of the player, but also of his or hers dorso-abdominal girdle.	Methodical indications: While launching the ball, the movement is spontaneously plyometrics. The posterior move of the ball towards muscular stretch is insisted upon.	Methodical indications: We look for the maximal lift of the weight centre, overcoming obstacles without excessive flexing of the inferiour limbs.	Methodical indications: Straight back. The lift is done rapidly, without pauses.	Methodical indications: Straight back. The lift is done rapidly, without pauses.

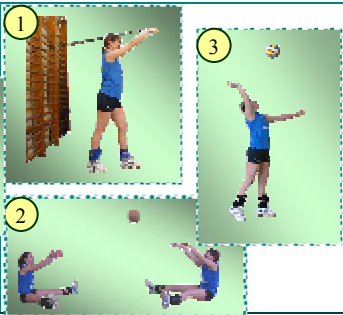
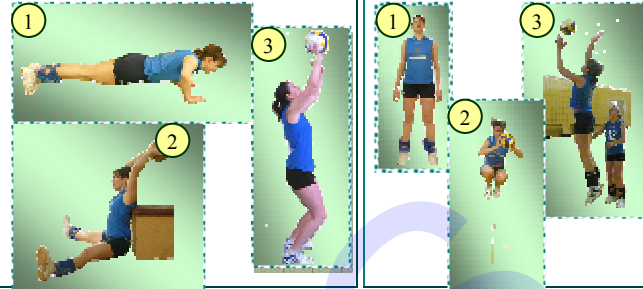
PROGRAMME 2

Table 7

A TYPICAL SESSION OF MAXIMAL FORCE PROGRESS— by alternating the contraction regymes (isometric-plyometric)					
The warm-up	The superiour limbs muscles		The inferiour limbs muscles		Relaxation
	 	 	 	 	
Description: 1. Moderate running; 2. Progressive rhythm running; 3. Speed running; 4. High speed running.	Description: 1. From backwaerd lying down on the gymnastics box, holding weights, elbow bending and maintained isometrics. 2. Weightsd push-ups from lying down.		Description: 1. Lifting the weight and maintained isometrics from standing. 2. Weight lifting at chest level and descending it from standing.		Description: 1. Knees bedning and maintained isometrics, from press standing. 2. Press flexions from a down position.
Dosage: 1. 6-7 minutEs; 2. 2 or 3 X 100 m; 3. 2 X 60 m; 4. 2 X 40 m.	Dosage: 10'' isometrics, 7 chest push-ups with a 60-90%weight + 10'' isometrics, , 7 chest push-ups with a 60-90%weight X 3-5 SERIES		Dosage: 10'' maintained isometrics, 10 lifts + 10'' isometrics, 10 lifts X 2 SERIES 40-60% weight		Dosage: 10'' isometrics, 14 press pushing + 10'' isometrics, 14 press pushing X 3-5 SERIES, with a 60-90%weight
Pause: 3 minutes	Pause: 1'30'; 2' after each series; 5' after the last series		Pause: 1'30'; 2' after each series; 5' after the last series		Pause: -
Methodical indications: The warm-up must be complete and thus conceived as to intensively solicit the muscular mass to be used during the session.	Methodical indications: The weight held at the shoulder's level. Each series is clocked.		Methodical indications: Too heavy weights are to be avoided here. The energetic use being very important, the maximal recovery between series will be used.		Methodical indications: Ample breathing movements.

PROGRAMME 3

Table 8

A TIPYCAL SESSION OF THE SPECIFIC FORCE PROGRESS (main thrower)– by alternating the contraction regymes (isometric-plyometric)					
The warm-up	The superiour limbs muscles		The inferiour limbs muscles		Relaxation
					
Technical description: 1. Running. 2. Stretching exercises	Technical description: 1. From a position of legs apart, the left leg forwards, the right arm lifted, holding the end of an elastic band. Taking the arm forward and stretching the band, with maintained isometrics. 2. Two players facing other two, from a seated position: throw of the medicinal ball. 3. Front, high serve.		Technical description: 1. Maintained isometrics from a tip position with legs apart. 2. Lateral jumps on two legs over the fences and holding the volley ball . 3. Ball-throw attack.		Technical description: 1. Maintained semiflexed position, legs bent 90°. 2. Two mattresses on the ground, 7 canes placed on them, at a 50 cm distance one from another. Jumps over them. 3. Attack throw.
Dosage: 1. 3-5 minutes 2. 10-20 seconds of maintaining it	Dosage: 10'' isometrics, 14 throws (3 kg) , 14 serves + 10'' isometrics, 14 throws (3 kg) , 14 serves X 3-5 SERIES		Dosage: 10'' isometrics, 7 jumps, 5 attack throws + 10'' isometrics, 7 jumps, 5 attack throws X 3 SERIES		Dosage: 10'' isometrics, 7 jumps, 5 attack throws + 10'' isometrics, 14 jumps, 5 attack throws X 5 SERIES
Pause: 1. 2 minutes 2. 10 seconds between exercises	Pause: 1'30'; 2' after each series; 5' after the last series		Pause: 1'30'; 2' after each series; 5' after the last series		Pause: -
Methodical indications: The warm-up must solicit the muscular masses to be worked during the session.	Methodical indications: Arms forward, the body slightly pushed forward also.		Methodical indications: The body is maintained in a vertical position and the knees are bent forwards.		Methodical indications: Ample breathing movements.

Results and discussions:

Table 9 The results of the initial-final testing and the dynamics of the jump height indicator for the 4 tests

No.	First and last name	h SJ		h CMJ		h CJbref		h CJS	
		TI	TF	TI	TF	TI	TF	TI	TF
1.	C.M	36.3	38.9	37.7	40.6	37.8	38.2	38.5	39.5
2.	Pr.A	38.1	40.7	38.2	40.6	34.8	38.6	41.8	43.5
3.	Pa.A	36.5	44.4	38.5	41.4	32.8	35.7	34.2	37.4
4.	M.A.	38.2	42.6	37.1	39.8	38.5	41.7	36.6	40.5
5.	I.M.	36.4	39.5	38.6	42.6	33.8	36.5	31.7	36.3
6.	M.A.	34.7	38.8	35	39.5	32.4	37.5	36.7	40.0
7.	G.D.	42.4	45.1	42.7	46.8	42.9	46.6	39.1	43.8
8.	T.R.	33.3	38.3	35.9	37	32.0	36.3	35.9	42.5
9.	T.A.	42.1	45.7	41.4	45.1	36.4	39.2	3	38.1
10.	P.D.	33.1	37.7	32.8	36.3	31.7	34.5	36.2	39.3
11.	C.A.	38.8	42.5	40.5	44.3	36.1	39.6	44.3	46.3
12.	U.D.	35.8	37.8	34.8	40.4	33.7	38.6	32.9	39.6
	X	37.14	41	37.73	41.2	35.24	38.58	34.24	40.56
	S	2.97	2.94	2.88	3.10	3.29	3.18	10.45	2.92
	Cv	8.01	7.17	7.63	7.53	9.35	8.24	30.53	7.20
	t		8.504		10.385		9.403		2.373
	p		< 0.001		< 0.001		< 0.001		< 0.05

The height indicator (h)

The jump height indicator registered significant increases for la SJ, CMJ and CJb at $t = 8,504$ la SJ, 10,385 la CMJ and 9,403 at CJb for $p < 0.001$. In the final CJs the evolution is significant, $t = 2,373$ $p < 0.05$.

Thus, the average for SJ increases from 37,17 in the initial testing at 41 in the final testing with a 3,8 difference at a very high performance homogeneity: $Cv = 8,01$ and decreases at 7,17 % in the final testing.

For CMJ the average raises from 37,73 in the initial testing to 41,2 in the final testing with a 3,47 difference and a great performance homogeneity of $CV = 7,63$ % at the initial test and 7,53 % in the final one.

In the CJb trial, the average goes up from 35,24 at the initial testing to 38,58 in the final one, with a difference of 3,34 at a great performance homogeneity of $Cv = 9,35$ % and goes down at 8,24 % in the final testing..

In CJs the average raises from 34,24 in the initial test at 40,56 in the final test, with a difference of 6,32 and a lack of homogeneity of performances, as $CV = 30,56$ % in the initial test and decreases at 7,20 % in the final testing, thus proving a large increase in homogeneity.

Table 10 The results of the initial-final testing and the dynamics of the power indicator at the level of the inferior limbs muscles for the 4 tests

No.	First and last name	P SJ		P CMJ		P CJB		P CJS	
		TI	TF	TI	TF	TI	TF	TI	TF
1.	C.M	13.1	17.3	23.8	30.2	26.6	28.4	45.1	46
2.	Pr.A	14.4	16.6	23.2	47.1	19.7	35.3	51.5	47.1
3.	Pa.A	12.3	14.7	21.3	22.4	18.0	32.8	35.3	34.2
4.	M.A.	12.1	14.7	19.7	27.5	17.7	27.9	28.1	35
5.	I.M.	15.6	19.7	20.1	24.1	19.5	21.3	27.6	32.6
6.	M.A.	11.7	15.1	20.2	22.0	18.3	23.8	38.0	34.1
7.	G.D.	18.3	20.1	21.3	24.2	22.5	20.5	41.4	40.2
8.	T.R.	10.2	14.2	20.3	22.8	20.2	19.2	38.5	32.9
9.	T.A.	11.7	14.9	23.2	31.0	21	26.5	37.1	38.6
10.	P.D.	8.2	12.4	19.7	20.5	17.7	19.1	28.1	34.7
11.	C.A.	15.8	17.5	24.7	24.2	26.3	30.5	53.6	50.9
12.	U.D.	14.4	16.9	23.7	24	22.2	31.4	35.7	34.9
	X	13.15	16.17	21.76	26.66	20.80	26.39	38.33	38.43
	S	2.728	2.273	1.83	7.18	3.09	5.56	8.54	6.25
	Cv	20.75	14.05	8.61	26.95	14.87	21.09	22.30	16.27
	t	2.876		2.564		3.341		0.081	
	p	< 0.05		< 0.05		< 0.01		> 0.05	

The power indicator (P)

The average of the power indicator for SJ raises significantly $t = 2,876$, $p < 0.05$ from 13,15 in the initial testing to 16,17 in the final one, with a difference of 3,02 at an average homogeneity of performances $Cv = 20,75$ and decreases at 14,05 % in the final testing.

For CMJ the average of the power indicator increases significantly $t = 2,564$, $p < 0.05$ from 21,76 in the initial testing to 26,66 in the final testing, with a difference of 4,9 at a very good homogeneity of performances in the initial test $Cv = 8,61$ and increases, becoming a lack of homogeneity for the final testing: $Cv = 26,95$ %.

In the CJb trial, the power average raises significantly $t = 3,341$, $p < 0.01$ from 20,80 in the initial test to 26,39 in the final test, with a difference of 5,59 at a mediocre homogeneity of performances $Cv = 14,87$ % in the initial testing and raises becoming weaker at 21,09 % in the last training.

For CJs the performances average increases in a non-significant matter, $t = 0,081$, $p > 0.05$ from 38,33 in the first test 38,43 at the final test, with a difference of 0,1 and a lack of homogeneity of performances $CV = 22,30$ % in the initial testing and decreases up to 16,27 % in the final test,

Becoming a medium homogeneity.

Table 11 The results of the initial-final testing and the dynamics of the leg equilibrium, (LE), Fast Twitch Fibres (FT), Effect of Prestretch (EP) characteristics for the legs muscles in the 4 tests

No.	First and last name	EP		FT		LE	
		TI	TF	TI	TF	TI	TF
1.	C.M	3.8	4.6	44.6	44.8	1.95	1.69
2.	Pr.A	0.1	0.4	39.9	43.1	2.08	2.63
3.	Pa.A	13.2	22.4	41.4	29.1	1.76	1.95
4.	M.A.	3.0	27.5	50.6	46.6	1.59	1.59
5.	I.M.	6.2	5.1	29.3	27	2.62	1.42
6.	M.A.	0.9	4.6	25.3	25.5	2.04	2.08
7.	G.D.	0.6	9.2	44.9	38.4	1.84	1.84
8.	T.R.	7.9	11.1	31.2	26.8	1.61	1.91
9.	T.A.	1.7	0.9	52.4	43.8	1.71	1.76
10.	P.D.	3.0	1.1	50.6	49.5	1.69	1.59
11.	C.A.	4.3	9.2	44.0	48.4	1.42	2.04
12.	U.D.	21.3	13.1	34.7	46.3	1.91	1.61
	X	5.5	9.1	40.74	39.10	1.85	1.84
	S	6.18	8.53	8.89	9.32	0.31	0.31
	Cv	112.45	93.65	21.84	23.83	16.75	17.33
	t		1.536		0.893		0.067
	p		> 0.05		> 0.05		> 0.05

The Pre-stretch Effect (Re-Use Elastic Energy) (EP) indicates the importance of the benefit produced by the pre-stretch (CMJ compared to SJ). The test results show insignificant evolutions at the level of the experimental group: $t = 1,536$, $p > 0.05$. One notices the effects of the training stimulations and the increase of the results average from 5,5 in the initial testing to 9,1 in the final one, showing the capacity to learn the reuse of the effective elastic muscular energy, thus reaching the optimal, recommended values. At an individual level, we find that a number of 4 female players reach excelency in what this indicator is concerned, 2 are at the optimum level, but the rest of the subjects reach inferior values, showing lack of ability to reuse the muscular elastic energy and a poor efficiency in strong vertical detachments in plyometrics execution conditions.

The percentage of Fast Twitch Fibres (estimation) indicates the percentage of fast muscle fibres responsible for the explosive force. The average of the two tests is kept around the data of 40,74 and 39,10 with insignificant evolutions at the level of the experimental group all throughout the experiment. The estimation of the percentage of fast muscle fibres shows a weak, bellow the average value, also determined by the lack of maturity of the young organism still growing and progressing, with an unstructured age, sex and training type connection.

The leg Equilibrium Index Equilibrium of the functional structure of the leg including three joints (hip, knee, ankle) and the upper and lower leg (thigh, calf)

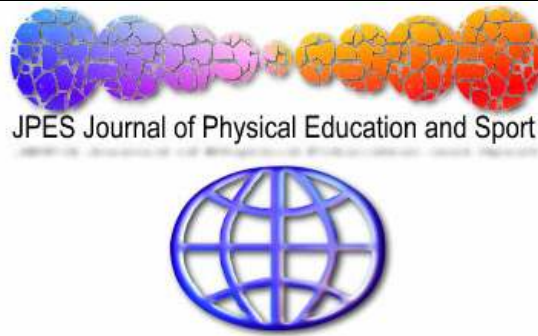
The average values of 1,85 and 1,84 in the two testing do not go through significant changes $t = 0,067$, $p > 0.05$, but show that the neuromuscular function of the knee, ankle and lower limbs are weaker than the hip and thigh. This is the reason why we may conclude that the force training for the legs muscles must be oriented towards the muscle evolution which consolidates the knee and calf joints, not to mention the neuro-muscular control capacity at this level.

CONCLUSIONS:

- Specific physical preparation must be one of the objectives which have precedence over others, in order to obtain optimal sporting performances;
- The muscular training objectives at this age were established for each period, in order to properly lead to its accomplishment at superior standards, and to favor its manifestation in optimal conditions during the competition period;
- Applying programmes of muscular training inside the preparation of young female volley players I, has contributed to improving the level of the technical executions and of their tactical behavior, a fact confirmed by the fulfillment of the game tasks and performance objectives, and it has also helped to decrease the number of accidents, thus creating premises for prolonging the sporting career.

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ORIGINAL RESEARCH

THE ANALYSIS OF THE QUALITATIVE ACQUISITION OF THE SCHOOL CURRICULUM IN HIGHSCHOOL PHYSICAL EDUCATION

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Introduction:

One of the basic criteria in the qualitative acquisition of the school curriculum in "Physical education" is the level of acquiring the technical elements and procedures within the three basic compartments, such as sports games, gymnastics and athletics.

In this regard, we found interest in the way that the qualitative indexes of the school curriculum are going to change in the case where the high school students' preparation was largely based on forming theoretical competences over the period of one school year, according to the proposed method.

Materials and methods: The research took place over 2000-2006, in three stages. In order to accomplish the objectives of the research, we used the following methods:

- The theoretical analysis and generalization of the specialty data
- The sociological survey (questionnaire, interview, discussions)
- The pedagogical observation
- The pedagogical experiment
- The mathematical-statistical method of data processing and interpretation
- The graphic and the tabular method.

Results and discussions:

In order to appreciate the quality of acquiring the "Physical Education" subject, there were selected three representative procedures of each compartment of the curriculum. Therefore, the "gaming sports" compartment was represented by: two steps shot (basketball), movement score (handball) and the spike or direct attack strike (volleyball); for the athletics compartment there were chosen: the extension long jump, oina ball pitching, and the 60m sprint race; for the "gymnastics" compartment there were analyzed the following: for boys, parallels – from equilibrium stance, to shoulder stance; for girls, uneven bars – from tuck on the lower bar swing to vertical handstand on the upper bar; punch vault over the vaulting horse (in length for boys and in width for girls) and the long roll.

All the above listed procedures have been symbolically divided into five phases, each having two points for correct execution, one point for partially correct execution and zero points for not fulfilling the task, the maximum score being ten points.

The evaluation of the quality aspect of the technical execution of the procedures was made by experts, while the statistical processing of their results was presented in centralized tables.

In the "gaming sports" compartment, for all three technical procedures of basketball, handball and volleyball, at the beginning of the pedagogical experiment, the groups were homogeneous, having approximately

the same preparation level. For instance, at the two steps basketball shot, the experimental group had 5.86 ± 0.41 points, while at the end of the experiment it rose up to 8.21 ± 0.43 points. The mathematical calculus proved a significant statistical growth, ($p < 0.01$) on this index.

Despite the fact that the positive difference of the score for the witness group shot was of 1.2 points, it did not bear statistical significance ($p > 0.05$).

The approximately same trend was noted in the case of the qualitative acquisition analysis of the handball movement score. In the beginning of the pedagogical experiment, the students of the experimental group registered an average of 5.63 ± 0.42 points, while the witness group had 5.68 ± 0.82 points. In the end of the experiment, the experimental group reached 8.06 ± 0.41 points, while the witness group had a score average of 7.13 ± 0.89 points. Just as in the previous case (the basketball compartment), the results growth was a statistically significant one only for the experimental group ($p < 0.001$).

The third test in the “gaming sports” compartment was the volleyball spike. This was a particularly complicated procedure and the initial testing showed low scores for both groups from a kinetic point of view of the technical execution of the procedure.

Thus, the experimental group had an initial 5.01 ± 0.43 points and a final 7.20 ± 0.41 points. The witness group had 5.04 ± 0.91 and 7.06 ± 0.89 points, respectively. The difference was statistically significant only for the experimental group ($p < 0.01$).

To a superior quality level compared with other compartments was the “athletics” one. Here there were analyzed three technical procedures reflected in the school curriculum such as the extension long jump, oina ball pitching, and the 60m sprint race. Observing the first procedure, the extension long jump, the initial testing brought by approximately similar results: the experimental group had 6.31 ± 0.35 points and the witness group had 6.29 ± 0.32 points. The final stage of the testing showed that the differences were statistically significant for both groups ($p < 0.001$).

Nevertheless, the experimental group had a better conduct than the witness group as it reached a 9.11 ± 0.36 score at the initial testing, a quite important score since the maximal score was 10.

Another analyzed procedure was oina ball pitching where, just as in the previous case, the beginning of the pedagogical experiment registered scores of 6.71 ± 0.35 points for the experimental group and 6.74 ± 0.52 points for the witness group. At the end of the experiment, those indexes rose to 9.24 ± 0.34 in the experimental group and 8.31 ± 0.53 points for the witness group. The differences were statistically significant for both groups, but the experimental group scored higher as their significance stage was $p < 0.01$, while the witness group had ($p < 0.001$) < 0.05 .

The last test of the athletics compartment was the 60m sprint race. As it was a relatively technically complicated test, the initial tests of both groups brought by sensibly qualitative equal results. For instance, the experimental group had an initial score of 5.82 ± 0.37 points, the witness group 5.79 ± 0.39 points. The final test showed that the experimental group progressed to 8.11 ± 0.40 points and the witness group to 7.23 ± 0.36 points. In both cases the difference was statistically significant, but the experimental group rose above the witness group ($p < 0.001$), which proves a better acquisition of the sprint technique at the 60m race.

The third examined compartment of the conducted research was “gymnastics”, where there were proposed three most representatives tests of the compartment, such as: the combined parallels exercise, the punching vault and the long roll.

Technically, the most difficult proved to be the parallels combination where the students, according to the school curriculum, had to swing from balance stance to shoulder stance. This was also proved by the initial tests of the pedagogical experiment where the students scored an average of 4.86 ± 0.39 for the experimental group and 4.82 ± 0.82 for the witness group. These indexes were tested again at the end of the pedagogical experiment and reached 8.21 ± 0.38 and 7.61 ± 0.84 , respectively. The statistical significance for the experimental group was $p < 0.001$ and $p > 0.05$ for the witness group.

Therefore, both groups had significant improvements in their results, but they were more conclusive for the experimental group where the students had a better theoretical preparation directed towards a clearer understanding of the tasks at hand during the physical education classes, including gymnastics classes.

Another procedure to represent gymnastics at pre-university level, as mentioned above, was the length vault. According to the centralizing table, both students groups had an approximately equal level of execution of the above mentioned exercise. The experimental group scored on average, 5.76 ± 0.37 points, while the witness group had 5.77 ± 0.56 points. At the end of the pedagogical experiment both groups had significantly better results, as the experimental group improved by almost three points, reaching 8.20 ± 0.39 ($p > 0.001$). The witness group progressed in what regards the vault, but to a statistically less significant level than the experimental group ($p > 0.05$). The reason, in our opinion, being that, despite the equal amount of practice for the witness group as for the experimental one, they lacked the theoretical knowledge which had a positive transfer regarding the element given in the experimental group.

The third procedure of the “gymnastics” compartment was the long roll on the floor, a basic gymnastics procedure of the floor exercises.

For the high school students, this exercise did not present any essential difficulties as regards the execution technique. This was obvious from the results registered at the beginning of the pedagogical experiment where both groups had virtually the same result with 5.84 ± 0.23 points for the experimental group and 5.80 ± 0.81 points for the witness group. At the end of the pedagogical experiment, both groups managed acquiring the procedure to a relatively high degree and both cases had statistical significance ($p > 0.001$ for the experimental group) and ($p < 0.05$ for the witness group). The final scores of both groups at the end of the pedagogical experiment were one of the highest compared to the other observed procedures, including those from the other compartments of the school curriculum. Therefore, the experimental group reached 9.26 ± 0.28 and the witness group 8.53 ± 0.87 points.

As mentioned before, all exercises were examined and marked by experts and the results were statistically processed with the purpose of appreciating the level of expert opinion agreement. Observing the table recorded data, it is clear that all three compartments and all analyzed tests the W agreement coefficient varied between 0.70 and 0.99 units, which proves a good opinion agreement over the exercises, thus ensuring that the objective recording of the results.

The same treatment was applied in the case of the school curriculum acquisition evaluation for the “Physical Education” subject for the girl’s lot where the experimental group had 62 girls and the witness group-60. The results were analyzed in the same manner for the three compartments where there were selected three procedures for each compartment, according to the high school curriculum: sporting games, athletics, and gymnastics. The level of school curriculum quality acquisition was evaluated with the aid of the experts and used the ten points marking system.

Following the evolution of the quality acquisition of the basketball procedure at the initial tests, the girls from both groups (experiment and witness) had virtually the same score: the experimental group had 5.70 ± 0.41 points and the witness group had 5.68 ± 0.89 points. In the final test, the girls from the experimental group improved their results up to 7.94 ± 0.63 points with a statistically significant rise ($p < 0.01$), while the witness group girls improved their indexes up to 7.21 ± 0.86 points. Although they also registered a rise of 1.53 points, it proved statistically insignificant ($p > 0.05$).

There is no practical difference in the evolution of acquiring the second technical procedure of the gaming sports, the handball movement score, where, at the beginning of the experiment, the experimental group girls had a score of 5.02 ± 0.39 and reached 8.24 ± 0.37 at the end., with a statistically significant rise ($p < 0.001$). The witness group had approximately the same result in the beginning of the pedagogical experiment (4.97 ± 0.81 points) and improved it by the end with only 2.38, thus having a statistically insignificant rise ($p > 0.05$).

The most difficult sporting games technical procedure was the volleyball spike or “direct attack strike”. The initial scores indicated by the experts did not go over five points for both groups. Thus, the experimental group had a 4.85 ± 0.52 points initially and the witness group had 4.67 ± 0.87 points. In the end of the experiment, the experimental group improved its index to 8.20 ± 0.39 points and the witness group to 7.19 ± 0.42 points. As in the previous cases, a statistically significant rise ($p < 0.001$) was recorded only for the girls experimental group.

As mentioned before, for the athletics compartment there were chosen: the extension long jump, oina ball pitching, and the 60m sprint race.

For the extension long jump, both girls groups had homogenous results at the initial test: the experimental group – 6.28 ± 0.42 points and the witness group – 6.24 ± 0.89 points. A better evolution in the end of the pedagogical experiment was shown by the experimental group girls who reached 8.84 ± 0.43 points, compared with 7.95 ± 0.78 points from the witness group. The mathematic calculus proved a statistically significant rise for both groups, but the experimental group had a more significant one ($p < 0.001$).

One of the relatively simpler procedures from the point of view of the technical execution was the oina ball pitching. This was pointed out right from the start of the pedagogical experiment when the girls from the experimental group registered the score of 6.33 ± 0.48 points and the witness group had 6.35 ± 0.39 points. In the end of the experiment, both groups had statistically significant differences, with higher values for the experimental group which had an average score of 8.35 ± 0.46 points ($p < 0.001$) and 7.46 ± 0.37 points for the witness group ($p < 0.05$).

The results for the 60 m sprint race were slightly lower as the most frequent mistakes made by the girls in the pedagogical experiment were related with the start position and the exit from the start position, which is why the initial test had the following scores: the experimental group 5.48 ± 0.39 points and the witness group 5.52 ± 0.81 points.

The end of the experiment brought progress for both groups as follows: the experimental group 9.02 ± 0.37 and the witness group 8.23 ± 0.83 points. In both cases there was a statistically significant rise, with a slightly better improvement for the experimental group ($p < 0.001$) compared with the witness group $p < 0.05$.

One of the more difficult to acquire compartments was the gymnastics one here the girls involved in the pedagogical experiment had to proceed with one or several gymnastics elements contained by the pre- university curriculum for the high school stage.

The most difficult from a technical point of view was the combined exercise on the uneven bars: from tuck on the lower bar swing to vertical handstand on the upper bar.

With respect to the appreciation of the quality of the uneven bars combination performance, the students managed to get the lowest scores compared with all the previous tests. Therefore, the experimental group was marked with 4.74 ± 0.45 points and the witness group with 4.77 ± 0.67 points. In the final test, the execution quality improved for the experimental group up to 7.94 ± 0.48 points and to 7.18 ± 0.61 points for the witness group. Regardless of the lower results for the final test, the results difference for both groups compared with the initial test had a statistically significant rise, in the first case $p < 0.001$ and $p < 0.05$ in the second.

The punching vaults were tested in the case of the girls, as well, where the vault was made over the width of the vaulting horse. The scores' average for the initial test was 4.83 ± 0.34 for the experimental group and 4.80 ± 0.65 points for the witness group, sensibly equal results. The final testing brought by a significant progress for the experimental group - with scores as high as 8.36 ± 0.35 points ($p < 0.001$), but only 7.28 ± 0.57 for the witness group ($p > 0.05$).

The final exercise from the gymnastics compartment and the general experimental block was the long roll on the floor.

This exercise faced no obstacles neither for girls or boys as to its execution. Therefore, the girls from the experimental group registered the initial score of 5.36 ± 0.39 points and the witness group had 5.39 ± 0.78 points. In the end of the experiment, both groups had statistically significant differences, with higher values for the experimental group which had an average score of 9.14 ± 0.34 points ($p < 0.001$) compared with 8.25 ± 0.80 points for the witness group.

The mathematic calculus determined the coefficient of expert opinion agreement with regard to the quality appreciation of the execution level for the technical elements and procedures on the three compartments of the pre-university curriculum of the "Physical Education" subject. Observing the recorded data, the agreement coefficient varied similarly to the case of the boys, from 0.63 (at the sporting games tests - basketball) to 0.91 (at the athletics tests – the 60m sprint race).

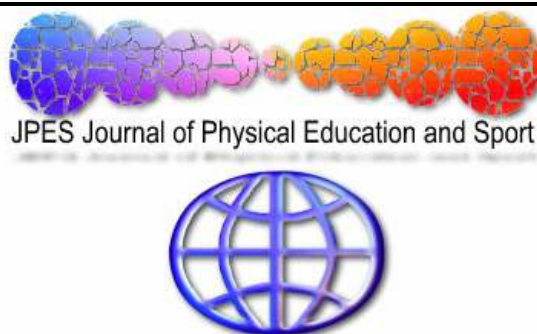
Conclusions:

As a result, the experts had approximately identical opinions regarding the quality acquisition of the execution technique for the evaluated procedures.

In general, analyzing the quality acquisition of the technical elements and procedures of the three compartments of the pre-university curriculum, there is noted a clear improvement of the results for the experimental groups of boys and girls who managed to acquire to a higher quality degree the subject matter comprised in the normative documents for the organization of the education process. There can be observed a clear correlation between the theoretical preparation of the students and the quality of the school curriculum acquisition. The more the theoretical preparation level grows, the more obviously increases the level of the technical procedures from the curriculum of the "Physical Education" subject. The given correlation expresses a thorough knowledge of the content and the necessity for the motor activities comprised in the school curriculum – a fact which had a positive impact on its successful acquisition by the experimental group students based mostly on the theoretical preparation of the high school students.

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ORIGINAL RESEARCH

SOCIOLOGICAL ASPECTS OF THE ULTRAS PHENOMENON IN THE CITY OF TIMISOARA

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Rezumat: Fenomenul ultras în Timișoara este reprezentat de galeria echipei de fotbal Politehnica Timișoara și se identifică cu numele de „Commando Viola Ultra Curva Sud”. Acest fenomen nu este nicidecum unul nou iar analizarea acestuia reprezintă o radiografie a grupului ultrasilor alb-violeti. Scopul lucrării de față îl reprezintă cercetarea modelului de suporter timișorean, caracteristicile și particularitățile sale la nivel de individ cât și grup.

Metoda anchetei, observației și a chestionarului au constituit mijloacele prin care s-au obținut datele cercetării. S-a constatat că în cadrul grupului se disting două tipuri de suporteri : suporterii simpli, veniți să încurajeze echipa și ultrasii, membri activi în Commando Viola, diferențele dintre ei remarcându-se la nivelul identificării : pentru ultrasii, echipa locală reprezintă totul în timp ce pentru suporteri, aceasta semnifică identificarea cu „a fi bănățean”.

Cuvinte cheie: fenomen ultras, suporter, identitate, galerie.

Summary: The ultras phenomenon in Timisoara has been represented by the gallery of the Politehnica Timisoara football team and has identified itself as „Commando Viola Ultra Curva Sud”. It is not at all a new phenomenon and its analysis implies radiography of the white-violet group.

The aim of the present paper is the research on the model of the Timisoara supporter, his or her characteristic features and peculiarities, both as an individual and as a group. The investigation method used in order to collect the research data has consisted of observation and questionnaire. It has been noticed that there are two types of supporters within the group: mere supporters, present at the games in order to encourage their team and the **ultras**, active members in Commando Viola. The main differences between the two categories of supporters being defined at the identification level: to the **ultras**, the local team means everything, while to the **supporters** it means to identify themselves to the concept “to be born in the Banat region”.

Key words: the ultras phenomenon, supporter, identity, gallery

Introduction

“Journalists and football club managers call the ultras wonderful spectators when everything goes well, but they call them hooligans every time there is trouble. In both cases, it’s about the same people.” (Dal Lago & Moscati, 1992).

The ultras represent a genuine football phenomenon through a set of characteristics. From the sense of identification to their own territory – that specific public enclosure marked off with one or several flags/ banners that wear the name or the symbol of the group, to the supporters’ outfits: pieces of clothes with the favourite team’s signs on, to which is added the almost compulsory wearing of a scarf in the colours of the team.

The Explicative Dictionary of the Romanian Language gives the following definition to the word *ultra*: “very/extreme/over/excessively”. “Ultras” stands for a group of young, fanatic supporters of a certain football team, sitting on the stadium in that particular area called “public enclosure” (that section that comes perpendicular on the sport field, where the visibility is not the best but the ticket is cheaper) who encourage their team, regardless the final result in a home game or away, using their own means (drums, petards, colour lights, smoking devices, flags, scarves, choreographies).

“Those who feel attracted to this style of supporting a team are usually young people, aged between 15 and 25, and this way of manifestation appeals to them because it is rebellious by its nature and it can also stand for a form of opposition, rebellion against a given rule. To a teenager, the fact that he or she has the possibility to socially represent himself/herself as an *ultras*, a rebel who breaks any rules, represents a major temptation. Thus, the teenager has the means to “get out of the box”, to skip the daily monotonous routine of his age and join some contemporary rebels.” (Beiu A., 2004).

The stadium, with its large and open spaces, allows the development of the phenomenon.

There are four main elements in the *ultra* mentality and in the definition of the ultras:

1. Regardless the result on the score table, nobody stops singing and cheering.
2. Don't sit down during the game.
3. No matter what the distance and the costs of the trip might be, an ultras always or as often as possible must accompany his team, both at home and away.
4. Total loyalty towards the section of the stadium, usually the public enclosure that hosts the *ultras* group.

A brief historical analysis of the phenomenon reveals that its first form appeared in Italy, in the early 50s. The first appearance refers to the group “Fedelissimi Torino”, in 1955 and the first name of an ultras brigade appeared in Sampdoria, in 1968, and it was the “Ultras Tito” group. In the late 60s and the beginning of the 70s the groups of supporters dramatically detached themselves from the classical, adult model, of the football spectator and they filled the public enclosures of the stadiums, those sections positioned perpendicularly to the sport field, where the visibility was not the best but the ticket was, and still is, cheaper. Nevertheless, together with the positive aspects brought to the sport show by its new type of supporters, unpleasant events, conflicts which sometimes turned into street fights between the galleries of the opponent teams or between galleries and police forces, dramatically ending in death causing violence, started to appear.

These events induced immediately an association of the ultras to the famous British hooligans (Russo & King, 2007). The ultras supporters' reply used to be, and still is, very clear cutting and it was sent through by messages written on hangers used during the games or street marches: “Ultras does not mean hooligans”. In Romania, the ultras movement appeared in the early 90s, thus it has a relatively short history because before 1989 the communist regime banned any forms of rebellious and beatnik organizations of the supporters, even if there were some attempts of manifestation at that time, too. For example, the supporters of the Rapid football team used to have a flag written with: Ultras Rapid (Beiu, 2004).

In Timisoara, the ultras phenomenon is represented by the F.C. Timisoara gallery “Commando Viola Ultra Curva Sud” who are located on the south public enclosure of the “Dan Paltinisau” stadium. Commando Viola (C.V.U.C.S) represent a social group whose goal is to perform, with their own means, a show at every game of FC Timisoara.

In 2003, the Professional Football League awarded C.V.U.C.S the trophy “The most beautiful football gallery in Romania” but still, violence cannot be denied, despite its low percentage compared to other groups in the country.

Although there are other football teams in Timisoara, too, no other gallery of any football team can be called an Ultras group of supporters, for several reasons:

- Once constituted, an ultras group must declare their identity.
- They must occupy a certain section on the stadium and identify themselves to it.
- They must support their team regardless the final score, both at home and away, no matter the distance.
- They must wear a scarf inscribed with the signs and the colours of the favourite team, round their necks.

Even if Timisoara does not have any other ultras groups, in Arad, the supporters of the UTA football team formed a similar type group but, the fact that the team is no longer taking part into the First League games, determines the lack of a real derby in the western part of the country and consequently, the absence of confrontations between the galleries. Nevertheless, the games in the Cup of Romania inflame the spirits and generate true hooligan behaviours.

The characteristics and peculiarities of the ultras “white-violet” phenomenon represent the object of the present research, starting with the mere presence of the supporters in the public enclosures to this group’s identification to Timisoara and the Banat region. . The supporter’s behaviour on the sports fields, their degree of implication in the activities of the group constituted around the football phenomenon, the type of support, the group as a social structure, its place and influence in society represent the main elements of this research. Making use of individual questionnaires, the research will focus on the activities and manifestations of the ultra group in order to distinguish their peculiarities.

Tasks of the Research:

- Apply a questionnaire to the supporters present at the games in the southern public enclosure; the questionnaire aims at gathering information about the perception of the ultras phenomenon, of sports in general, of violence on stadiums, the structure and organization of the white-violet gallery, marital status and educational level.
- Identify the influence of the ultra group over the entire stadium during the games.
- Identify the causes that generate violence, reciprocity towards some opponent teams and implicitly, towards their supporters.
- Underline the positive and the negative elements of this phenomenon and their impact on the ultras type supporter and society in general.

Hypothesis

The difference between the supporters and the ultras group is obvious at the identity level: if to the ultras, identification to the team is total, generating thus a way of life, to the supporters it’s only a matter of local identification, generating the pride of “belonging to the geographical region” (banatean)

Materials and Method

205 questionnaires were given out and 198 were recovered (a percentage of 96,6%) over the time of the return games during the national championship in 2008/2009. The questionnaires were distributed into various locations: the south public enclosure of the “Dan Paltinisau” Stadium of Timisoara, on the bus driving from Timisoara to Cluj for the game in the quarters of the Cup of Romania, played between F.C. Timisoara and Gloria Bistrita (April 15-th 2009) and during the weekly meetings of the ultras groups „MCMXXI” and „Hell Unit”. Method used: questionnaire type investigation, observation, mathematical-statistical method, graphical method.

Results

a. Categories of supporters of the FC Timisoara team

From the total of questioned persons, it was noticed that the supporters of the FC Politehnica Timisoara, in the South public enclosure, are divided into three sub-categories of which the ultras group appeared to be the most representative (54%), followed by the supporters (43%) and in a very small proportion (3%), by the self-declared hooligan group.

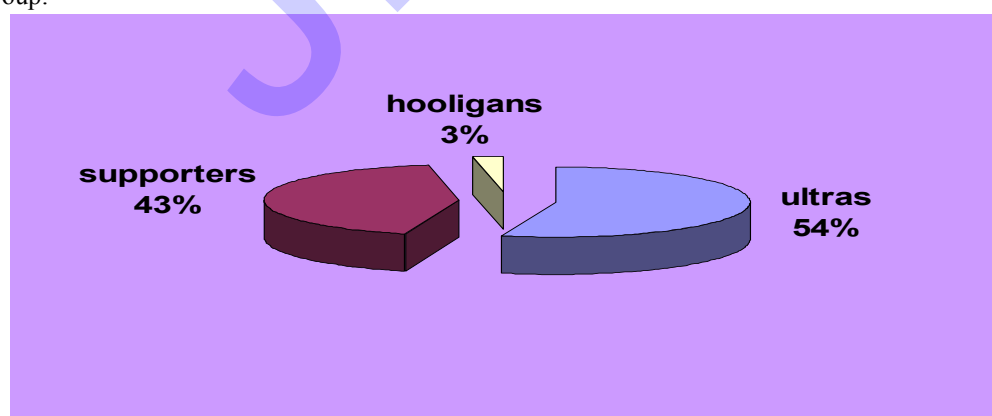


Figure 1

The questioned persons self-identified themselves as being ultras, supporters or hooligans.

In supporting their belonging to a specific group, we can notice from the table below that during a game played away, the ultras choose to support their team in proportion of 92% while the supporters only in a proportion of 66%.

Table no.1

Games Away	ULTRAS	SUPPORTERS
YES	92%	66%
NO	8%	34%
TOTAL	100%	100%

For the supporters, the games' selection criteria are set according to the level of the opponent's importance (70%) while for the ultras, they attempt to be present at half of the games played away (55%) and 34% of the ultras consider that being present at all the games is essential for their ultras status.

Table no.2

Travelling to away games	ULTRAS	SUPPORTERS
Important games	11%	70%
Every game	34%	5%
Half of the games	55%	25%
TOTAL	100%	100%

a. Team representation for supporters and ultras

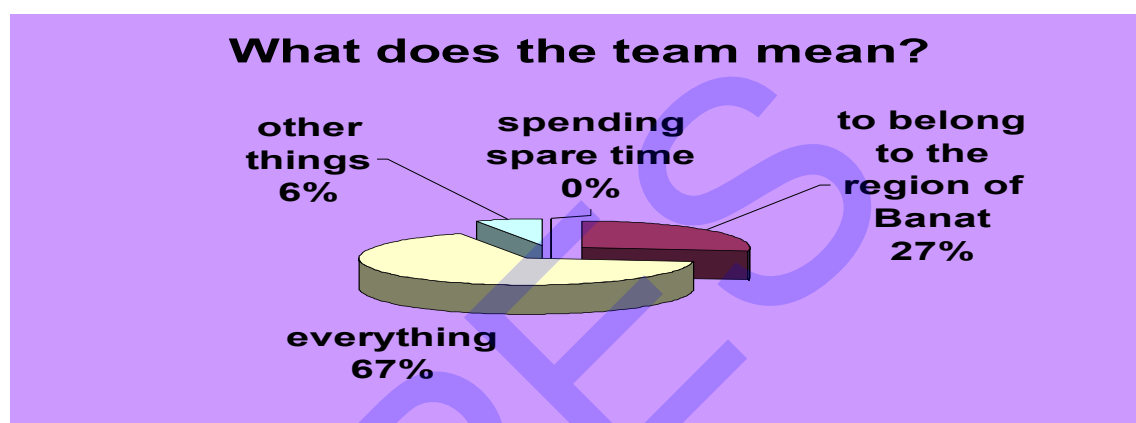


Figure 2- Ultras

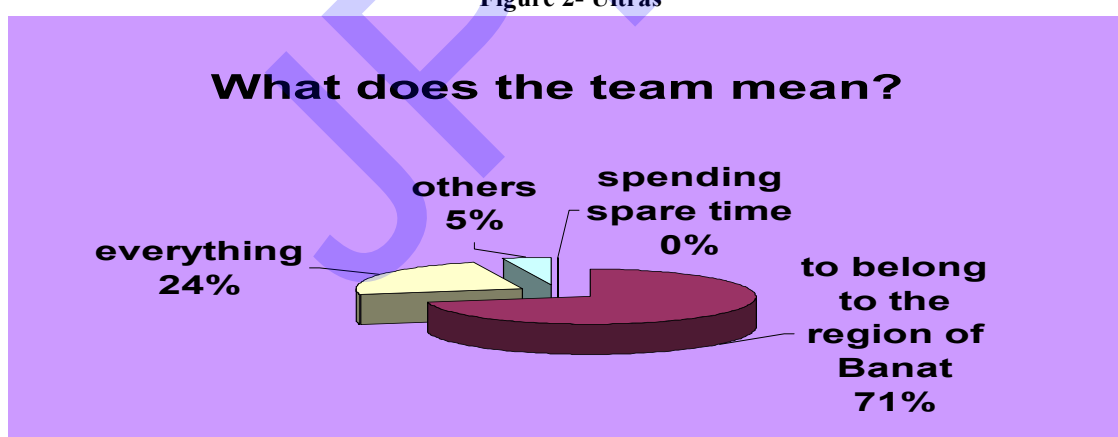


Figure 3- Supporter

The team is differently represented for the two groups that have the majority amongst the supporters; the ways of experiencing the phenomenon differs within the two groups: ultras and supporters. For 67% of the ultras, the FC Timisoara team represents “everything”, i.e. a way of life, while it represents only 24% for the supporters.

The difference between the ultras and the supporters can be also seen in their sense of identity, expressed in the concept “to be born in the Banat region”: if to the supporters, the concept is representative for 71% of them, in the case of the ultras, the concept is representative only for 27% of them.

Tabel no.3 illustrates that the majority of both ultras and supporters are born in Timisoara, which explains their local identity feelings towards the most representative club of the city.

Tabel no. 3

BORN IN TIMISOARA	ULTRAS	SUPPORTERS
YES	80%	81%
NO	20%	19%
TOTAL	100%	100%

b. Reasons for choosing the South Public Enclosure

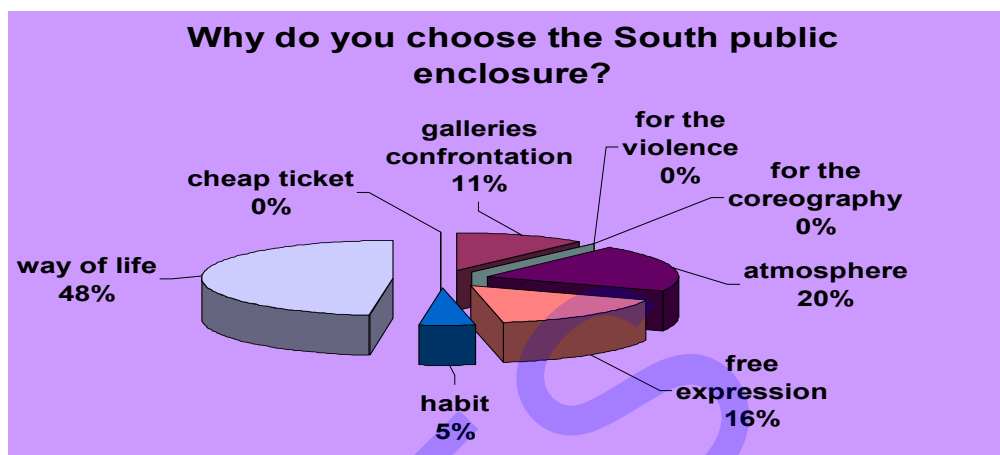


Figure 4 –Ultras

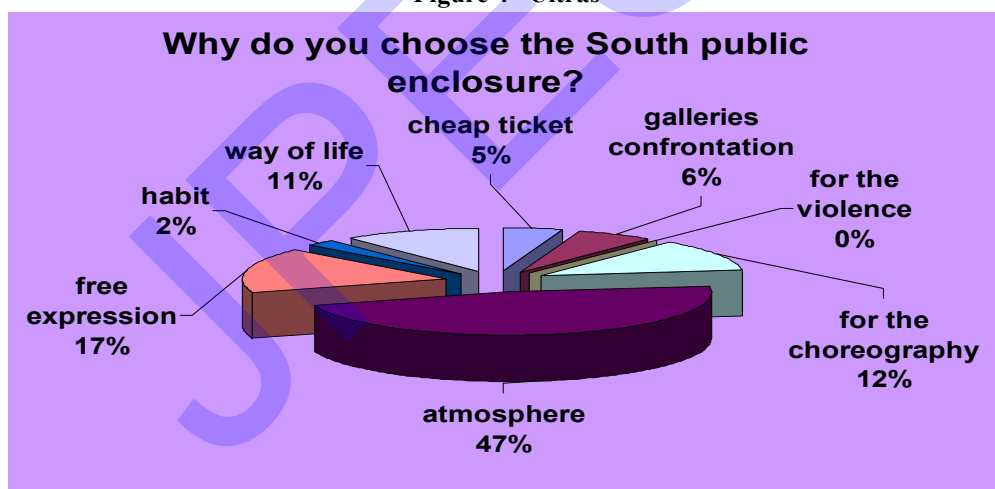


Figure 5 – Supporters

Comparing the two charts (figures 4 and 5), we notice that to the ultras, the South Public Enclosure is a way of life, a representative space in the entire architecture of the stadium, the place where they meet in order to produce their choreographies, banners, in order to send messages that most of the times go beyond sports and penetrates the social field that surrounds the football phenomenon. Among the supporters, those who choose the South Public Enclosure (47%) appreciate the atmosphere, taking part into the choreographies (12%) despite the fact that to the ultras, choreography is nothing more than a way of expressing the group identity, that “everything” which motivates the individuals to join the group.

Officially called “the most beautiful gallery” in 2003, for their fair-play spirit, the Timisoara gallery also chooses the South Public Enclosure for their possibility to express their feelings, to live the games (16% for the ultras, 17% for the supporters). The show created and performed during their team’s games is not an aggressive one, so even women and children spectators can enjoy it on the “Dan Paltinisanu” stadium.

Looking for a confrontation with the opponent gallery motivates 11% of the ultras and 6% of the supporters.

But the confrontation is achieved more at a symbolic level, by sending messages and not through violence (0% options both for the ultras and the supporters).

Table no.4 illustrates that in the direct confrontations between the galleries, 72% of the ultras were much and very much involved, which indicates a high level of implication compared to that of the supporters who declare themselves little involved (43%), the phenomenon being an accidental one and only when they have to face some aggression and defend themselves.

Table no.4

Level of involvement in the gallery confrontations	ULTRAS	SUPPORTERS
Very much	43%	12%
Much	29%	16%
A little	18%	43%
At all	10%	29%
TOTAL	100 %	100 %

To the ultras, the fact they are organized in an independent group, makes declare their attachment to the values of the group and the identity sense is expressed through that particular way of being, justifying thus their perception of the team as meaning “everything” to them, and inspiring a positive attitude (for 27% of them). The rate is the other way round for the supporters, to whom the positive attitude is the main reason to take part (53%). By “positive attitude” they mean taking part to the choreography, expressing their emotions, supporting their team.

Table no. 5

Reasons to participate	ULTRAS	SUPPORTERS
Group membership	49%	20%
Positive attitude	27%	53%
Decrease aggressive attitude	5%	5%
Self confidence	7%	9%
Socializing	12%	13%
TOTAL	100 %	100 %

d. Social Status of Supporters and Ultras

Table no. 6 illustrates that the ultras group's educational level is higher than that of the supporters. University and post-university education cover 43% of the ultras, while in the supporters group, this level of education represents only 29% of the group, the first percentage under the percentage of 33% of supporters with medium education (high school graduates). This picture can offer arguments for the fair-play spirit promoted by the gallery and for their fight against the decision made by the Romanian Football Federation concerning the sanctions that had been imposed to the club.

Table no.6

EDUCATION LEVEL	ULTRAS	SUPPORTERS
Elementary	1 %	6 %
Secondary	6 %	19 %
High school education	41 %	33 %
Post highschool	0 %	2 %
Vocational	9 %	11 %
University	27 %	24%
Post university	16 %	5 %
TOTAL	100 %	100 %

The age and the social status of the people questioned (table no.7) indicates the fact that adolescence (60% of the supporters under 20) is a time for exploring and searching for identity. Being present next to the ultras group, the possibility to express their feelings and emotions (17%), as well as a lower ticket price (5%) motivate teenagers' choice.

Table no. 7

AGE	ULTRAS	SUPPORTERS
Under 20	33%	60%
20-30 years old	61%	32%
Over 30	6%	8%
TOTAL	100%	100%

Table no. 8 shows that both ultras and supporters are not married (84% ultras, 83% supporters), thus having fewer obligations and family responsibilities which might prevent more or less directing their energy and feelings towards the football team.

Table no. 8

MARITAL STATUS	ULTRAS	SUPPORTERS
married	9%	11%
divorced	7%	6%
single	84%	83%
TOTAL	100 %	100 %

Conclusions:

The study reveals that there are differences among the supporters of the FC Timisoara team, regarding the way of involvement in the extra activities of the group they belong to.

If a supporter has a presence of 66% at the games away, an ultras will be present at 92% of the games away but the major difference is given by the sense of belonging to the team and the feeling of identity which come along with the status of supporter of the Banat team (for the supporters) as well as by the fact that the Banat team means “everything” to the individual who has declared himself an ultras.

Taking into consideration that both survey groups include mostly single individuals and that that are at the age of teen quests (under 20 for supporters) and of searching for their identity (between 20-30 years old for the single ultras) testifies the hypothesis of total or partial identification to the team of Timisoara.

A very low percentage (3%) think of themselves as hooligans, the type of supporter whose main feature is hatred for the supporters of the opponent team, expressed through physical and verbal violence, fanaticism which can get to the highest level.

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ORIGINAL RESEARCH

TRAINING STRATEGIES SPECIFIC TO THE PHYSICAL EDUCATION USED IN ORDER TO DEVELOP THE COORDINATIVE CAPACITIES - EQUILIBRIUM

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Abstract. Coordinative capacities express themselves in the gesticulation sphere and help the motor learning being connected to the organization, control and movement adjustment processes; a good coordination represents the condition necessary to an execution as much as possible close to the established motor program. The equilibrium capacity is defined as being the maintaining capacity of the body in a certain established position and its re-equilibration after high amplitude shifting and solicitations; in maintaining the equilibrium the vestibular analyser's role is determined.

Methods: Proper investigation methods have been used among which - the observation method, the measurements and recording methods (The Bass test, the Flamingo test, the Matorin test), the experimental method and the obtained data processing and interpretation methods – the statistic-mathematical method and the graphic one.

Results: The use in a higher percentage the means specific to the coordinative capacities – equilibrium, had as effect a significant increase, from one measurement to another, by applying the three tests, both for the female students pattern and for the male students, fact emphasized also by presenting the three graphics.

Conclusions: The use, in a higher percentage, the means specific to the development of the coordinative capacities – equilibrium, also the variety of working conditions during the physical education class, has contributed to the improvement of the calculated arithmetic means for the coordination tests – equilibrium. On this ground we can make a methodical line, in the analytical program, for the development of the students' coordinative capacities.

Key words: training strategies, physical education, coordinative capacities, equilibrium.

Introduction and research objectives

In the physical education, the coordinative capacities represent an important premise for the proper appropriation/execution of the motor skills at a superior level (rational and in a creative manner) and to quickly adapt at different working conditions, specific to the different sport branches; like speed, coordinative capacities are determined genetically, so the perfection possibility is lowered in the case of the subjects that do not have it innate.

Coordinative capacities are motor qualities very complex (psycho-motor), with an extremely rich content of components, they represent an essential role in the harmonious physical development and implicitly in reaching the training and competition objectives. Although there are a number of opinions concerning the coordinative capacities there are also common opinions in what concerns the components of these coordinative capacities [Dragnea A. and Teodorescu S., 2002, pg. 350], namely:

- *The movement combination capacity* has the role to make the connection between the automatic motor skills (between the elements and technical procedures specific to certain sport branches).
- *The spatial-temporal orientation capacity* allows the change of the positions and body movement in space and time, in comparison with a certain action field.
- *The kinaesthetic differentiation capacity* allows a smooth control, differential of the dynamic, temporal and spatial parameters of movement.
- *The equilibrium capacity* assures the body maintenance in a certain stable position and its re-equilibration after movements and solicitations of a high amplitude.
- *The reaction capacity* assures making certain fast motor responses at different stimulus.
- *The rhythm sense* represents the individual's aptitude to organize in time and space his motor executions.
- *The movement transformation capacity* allows that the motor program of a certain action in progress to be adapted or modified depending on the unpredictable transformations and completely unseen of the situation, being even able to require a movement interruption.

Specialists from the medical field, define equilibrium as representing a complex process that interests the reception and sensorial input organisation also as the program and movement execution, elements that assure the straight posture meaning the permanent maintenance of the weight centre in the sustaining base frame. Maintaining the equilibrium respective to the normal posture is based on the basic reflexes that contribute to the eyes, head and body orientation in concordance with the environment:

- *the vestibule-ocular reflex* allows the eyes and head movement coordination;
- *the vestibule-spinal reflex* assures the body's stability when we move our head (important in orthostatism to align and fix the body on the inferior limbs), allows the straight orientation, in the axe of the head, body, also of the looking forward;
- *automatic postural answers* have the role to remake the stability and are answers of the organism at every exit tendency of the weight centre from the support polygon, represent stereotypical movements;
- *anticipate postural answers* similar to the automatic postural answers but precede the equilibrium's perturbation in the case when it can be predictable; the organism takes in advantage a set of postural measurements of counteract, automatic measurements stacked in the stored experience;
- *Volitional postural movements*, perturbations of the equilibrium by translating the gravitational line of the body towards the stability limit.

The main objective of the dynamic equilibrium development is to contribute at the development of the man's capacity in order to make motor acts and actions with a superior level of coordination in efficient conditions and with a minimum energetic and nervous consumption. The equilibrium capacity educable in certain limits will have the role to diminish the accidents' risk during the executions and a precise role in the high performance capacity development. The research objectives aim at:

- assuring the theoretical and practical data base in order to understand the approach of the subjects during the physical education and sport;
- understanding the application, programming and interpretation capacity of the aspects concerning the equilibrium capacity development;
- gathering the updated information with reference to the approach of this psychomotor capacity – equilibrium;
- The acquisition of new documents and motor actions in order to enlarge the motor luggage and their application in adequate situations improving in this situation the coordinative capacity value.

Research hypotheses

- Specific means to the equilibrium development, also the variable working conditions, lead to the improvement of the equilibrium indexes, as a factor favourable to the perfection of the coordinative capacity.
- The conception of a methodical line of development of the coordinative capacity at students represents the premise favourable to the progress of the individual physical condition, rendered valuable by participating at sport competitions.

Research procedures and methods

The research has been developed during the physical education classes during the university year 2009-2010, at the professional study groups of the faculties of the *Petroleum and Gas University of Ploiesti*; in the research have been included 3 groups with a total number of 98 students (52 female students and 46 male students). The physical education classes are compulsory encountered in the educational program of the first and second years, 2 hours/week (1 module), representing 58 hours/university year. The experimental method consisted in applying during the physical education and sport means to develop the coordinative capacities –

equilibrium, in a higher percentage and making two tests: the first one in October 2008 and the second one, after using these means, in May 2009. For the good development of the experiment, proper investigation means have been used among which – the observation method, the measurements and recording methods, the experimental method and the obtained data processing and interpretation – the statistic-mathematic method and the graphic one. The measurements and recording methods have consisted in applying and recording the results at the following tests:

- *The Bass Test* [Epuran, M., 2005, pg. 370, figure 17.4] is consisted from the making of 10 jumps made on the marked spaces (11 marked spaces, dimension of 2,54 cm x 2 cm) with chalk or adhesive tape on the ground or floor; the starting position: from standing position with the left foot on the marked space, starting from jumping and landing on the left foot in the other marked space, in which he maintains the equilibrium position for 5", after which there follow a succession of taking-offs and landings alternatively on a foot and the other and maintaining the equilibrium for 5", until the track is over. The sole must cover completely the mark so that this is not seen. A good score consists of covering each mark with the sole without touching the ground/floor with the heel or other part of the body and maintaining the static position time of 5 seconds. 5 points are given for each landing and correct covering of the mark and we add one point for every second of maintaining the static equilibrium. The students can obtain a maximum of 10 points for every mark or a total of 100 points for the entire track. Every of the 5 seconds of trying to maintain the equilibrium will be counted in a loud voice, with one point given for every second and with the recording of the points for every mark. The subject is allowed to re-equilibrate, trying to maintain the equilibrium for 5 seconds, after he landed correctly.

- *The "Flamingo" Test* [<http://www.topendsports.com/testing/eurofit.htm>] consists of maintaining an equilibrium position time of 1 minute in a standing position on a foot, bare-footed or with socks, on a lath (5 cm high and 3 cm wide), with the other foot bended from the knee articulation and keeping with the hand the ankle; the arm is forward lifted, bended from the elbow articulation, he supports on the examiner's arm and has the role to maintain the equilibrium; the test starts in the moment in which the contact with the examiner's arm is being interrupted; time is measured as much as the equilibrium is maintained, meaning the time in which he does not let go of the bending foot and no part of the body enters in contact with the ground; if the hand releases the ankle that it sustains or if a body part takes contact with the ground, the test is taken again. The effective maintaining of the equilibrium time is being measured.

- *The Matorin Test* [Epuran, M., 2005, pg. 371] consists of making a jump with turning around the longitudinal axe of the body, towards left or right. It is being recorded every variant and the sum of the two rotations. The measurement is realized with the help of a compass in sexed-gesimal grades. Matorin has equalized the performance of over 360° with the qualifying "very good".

Specific method for the equilibrium capacity development

- Movement execution variation – combining certain partial phases, certain sequences, perhaps by varying the rhythm
- Extreme conditions variation – the variation of the conditions and space, devices dimensions
- Combining certain automatic skills by the successive or simultaneous binding of the appropriated motor skills
- Practicing by timing certain well known exercises
- Information variation – the extension or restriction of the received information by the athlete depending on the environment modifications.

Among these methods we can use the means: exercises made on a fatigue ground; exercises in which we follow the imitation of certain established motor sequences; executions from both sides – these last two methods allow a lot of variations and can be connected between them, their choosing being imposed by the nature of the coordination capacity that will be developed; all the exercises that stimulate the body's equilibrium or of certain controlled devices by athletes; exercises of elementary acrobatics. Used means during the physical education class, for the development of the equilibrium capacity:

- from standing, palms caught at the back, walk on the tip of the toes with eyes closed, distance of 10 – 15 m, 2 – 4 repetitions, break coming back at the starting line;
- walking/running in equilibrium on the gym bank with stops/starts at different signals, 4- 8 repetitions, break coming back at the starting line;
- walking on the tip of the toes on the gym bank with turning backs of 180°, 5 – 8 repetitions, break coming back at the starting line;
- walking with crossed step or walking on all fours 4 – 6 repetitions, break coming back at the starting line;
- standing with a stick near the leg: balance by taking it and maintaining it horizontally, grabbed by the end, 6 – 8 repetitions, break with coming back at the starting line;
- standing in equilibrium with arms sidewise, on a stick positioned longitudinally: leaving forward without touching the ground with the soles, 6 – 8 repetitions, break with coming back at the starting line;

- walking on the tip of the toes, on a line drawn on the ground in zigzag, 8 – 10 repetitions, distance of 15 – 20 m, break with coming back at the starting line;
- walking on the tip of the toes, squatter, with the face or back on the gym bank on the wide or narrow side at different heights from the ground, 6 – 8 repetitions, break with coming back at the starting line;
- walking on the gym bank, on both sides with different segments moves, throwing and catching a ball, with the skipping rope, with pirouettes, running and jumping over different objects, 8 – 10 repetitions, break with coming back at the starting line;
- jumping with a stick maintained vertically in equilibrium on the palm, 8 – 10 repetitions, duration 15 – 20", break of 20 – 30";
- balance alternatively on a foot and the other (it is being used the gym crossbar, the versed bank or with a log, a raised border), 6 – 8 repetitions, break of 20 – 30";
- standing on one foot, the other one stretched forward, spinning in a circle, 8 -10 repetitions, break of 20 – 30";
- from squatter position, brusque lifting in balance and maintaining it 10"- 15", 6 – 8 repetitions;
- intercalary running with simple and double pirouettes, on a distance of 30 – 40 m, 4 – 6 repetitions, break of 20 – 30";
- walking, at the signal squatter, turning back 180°, running, distance of 25 – 30 m, 6 – 8 repetitions, break of 40 – 60";
- running by two, on a bank, at the signal, changing places between partners, 6 – 8 repetitions, break with coming back at the starting line;
- equilibrium on a drum which rolls back and forth, 4 – 6 repetitions, break of 20 – 30";
- throwing the ball high, rolling forward and catching the ball, before it touches the ground, distance of 15 – 20 m, 6 – 8 repetitions, break of 20 – 30";
- in pairs: one in bent position with the hands on his knees, the partner with a ball, the exercise begins by throwing the ball up over the partner, jump at the "living goat" and catching the ball before it touches the ground, while the partner runs in his front laying in the same position, distance of 20 – 25 m, 4 – 8 repetitions, break with coming back at the starting line;
- jumps on the spot with moving the leg at the same time with hitting the palms forward and at the back, 3 – 6 repetitions, break of 45 – 60";
- jumps with the skipping rope going forward, laterally, with maximum speed, distance of 30 – 40 m, 4 – 8 repetitions, break of 40 – 50";
- jumps with the skipping rope, with maintaining the legs crossed, then with alternative changing of the crossing and changing the module of handling the skipping rope, duration of 30" – 50", 4 – 6 repetitions, break of 40 – 50";
- vertically jumps, with ample extension of the body, 1 – 2 series of 6 – 8 repetitions, break of 50 – 70";
- jumps with knees at the chest, as higher as possible and with maximum squat, 1 – 2 series of 6 – 8 repetitions, break of 60 – 80";
- lateral jumps from one side and another over a lath, over the versed gym bank or a extended rope, 1 – 2 series of 6 – 8 repetitions, break 60 – 90";
- relay race with the bat on which we keep in equilibrium a small ball, any fall of the ball from the bat is being penalized; (on the track there can be introduced also obstacles, over which we jump or we walk in equilibrium), 3 – 5 repetitions, break of 30 – 45";
- jumps on the elastic net (where there is and used with high caution), one of the most recommended apparatus for the development of the sense of equilibrium, spatial control of the body and movement coordination;
- different acrobatic exercises made in precarious equilibrium conditions, meaning at high distances from the ground (0,5 cm to 2m), on the gym crossbar, elastic boards fixed between two pillars etc., 6 – 10 repetitions;
- from the same position (in equilibrium on a crossbar high at 2m) the subject tries to imitate in a mirror quickly and correctly different moves, exercises, steps, turning backs or positions that other subjects makes then at the ground, 6 – 10 repetitions;
- Elementary acrobatic gymnastic consisting in: rolling forward-back; different jumps with and without a trampoline at different gymnastic apparatuses; different jumps and chaining of acrobatic elements and jumps with or without trampoline at gymnastic apparatuses; jumps on the carpet or different mats, 6 – 10 repetitions;

Research results and their interpretation

Obtained data processing and interpretation has been realized through the calculus of the arithmetic mean (X), the standard deviation (S), the variability coefficient (Cv%) and the significance of the difference between the means by calculating the "t" [Dragnea, A., 1984, pg. 27]. In the lack of a data base for these tests, the reports have been made on the basis of the obtained results after the initial and final measurements.

Table 1. Calculated statistic indicators

Test	Statistic indicators	Female students		Male students	
		Initial testing	Final testing	Initial testing	Final testing
Bass	X	77,23	87,67	80,97	89,07
	S	5,11	6,08	7,25	8,35
	Cv%	6,61	6,93	8,95	9,37
	„t”	9,66		5,01	
Flamingo	X	45,66	56,55	47,91	57,84
	S	8,12	10,65	11,23	10,71
	Cv%	17,78	18,83	23,43	18,51
	„t”	5,91		4,37	
Matorin	X	179,33	210,45	223,77	251,14
	S	12,09	16,23	16,61	13,46
	Cv%	6,74	7,71	7,42	5,35
	„t”	28,32		8,68	

The Bass Test

• *Female students.* By calculating the arithmetic mean (table 1, figure 1), $X = 77,23$ points, after the initial testing and $X = 87,67$ points after the final testing, we can notice an obvious progress of 10,44 points.

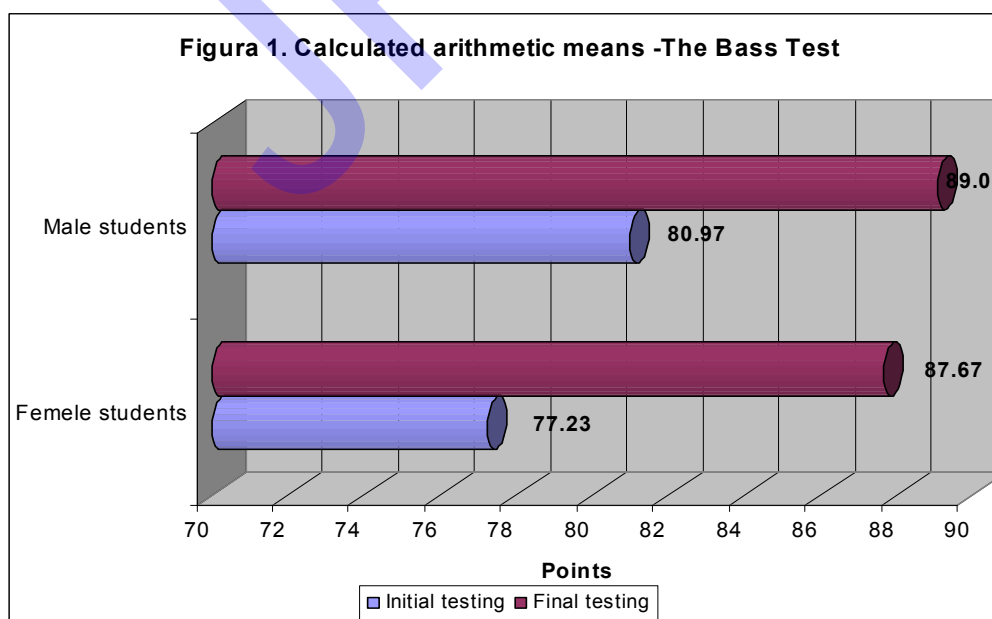
The calculated variability coefficient (table 1) frames the pattern, after the results from the two tests as having a high homogeneity.

By calculating the value of “t”, (table 1) that aimed the significance of the difference between the means, where $t = 9,66$, higher than tabular “t”, so the difference between the two means is significantly different in a percentage of 99%, chance interfering in a percentage of 1% at the significance level $p < 0,01$.

• *Male students.* By calculating the arithmetic mean (table 1, figure 1), $X = 80,97$ points, after the initial testing and $X = 89,07$ points after the final testing, we notice a progress of 8,10 points, but less significant than in the case of female students.

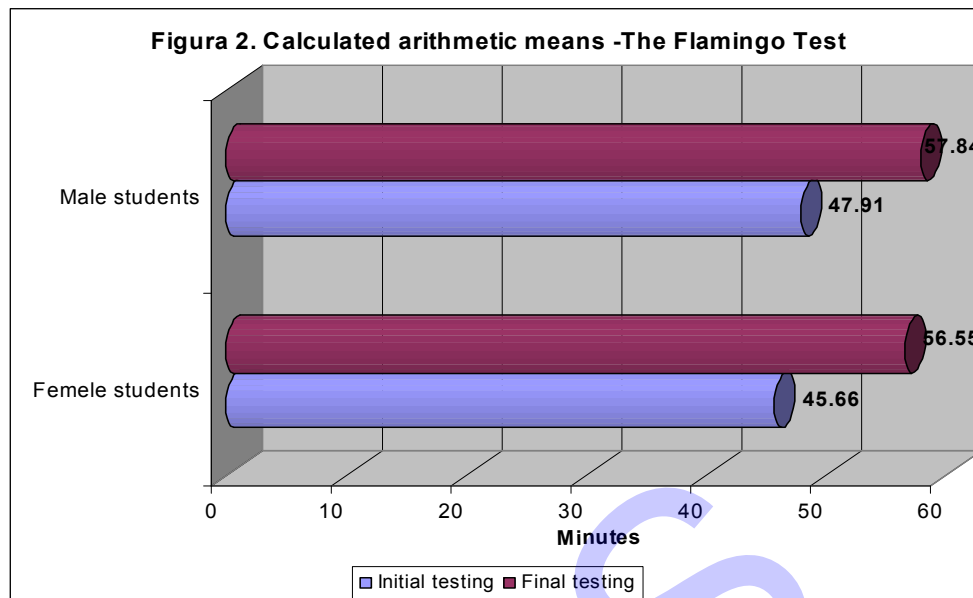
The calculated variability coefficient (table 1) frames the pattern after the results from the two tests as having a high homogeneity.

By calculating the “t” value (table 1) that aimed the significance of the difference between the means, where $t = 5,01$, higher than tabular “t”, so the difference between the two means is significantly different in a percentage of 99%, chance interfering in a percentage of 1% at the significance level $p < 0,01$.



The Flamingo Test

• *Female students.* By calculating the arithmetic mean (table 1, figure 1), $X = 45,66$ minutes, after the initial testing and $X = 56,55$ minutes after the final testing, we notice a considerable progress of 10,89 minutes, from a measurement to another.



The calculated variability coefficient (table 1) frames the pattern, after the results from the two tests as having a medium homogeneity.

By calculating the value of “t”, (table 1) that aimed the significance of the difference between the means, where $t = 5,91$, higher than tabular “t”, so the difference between the two means is significantly different in a percentage of 99%, chance interfering in a percentage of 1% at the significance level $p < 0,01$.

• *Male students.* By calculating the arithmetic mean (table 1, figure 1), $X = 47,91$ minutes, after the initial testing and $X = 57,84$ minutes after the final testing, we notice a progress of 9,93 minutes.

The calculated variability coefficient (table 1) frames the pattern, after the initial testing, as having a lack of homogeneity and after the final testing, a medium homogeneity.

By calculating the value of “t”, (table 1) that aimed the significance of the difference between the means, where $t = 4,37$, higher than tabular “t”, so the difference between the two means is significantly different in a percentage of 99%, chance interfering in a percentage of 1% at the significance level $p < 0,01$.

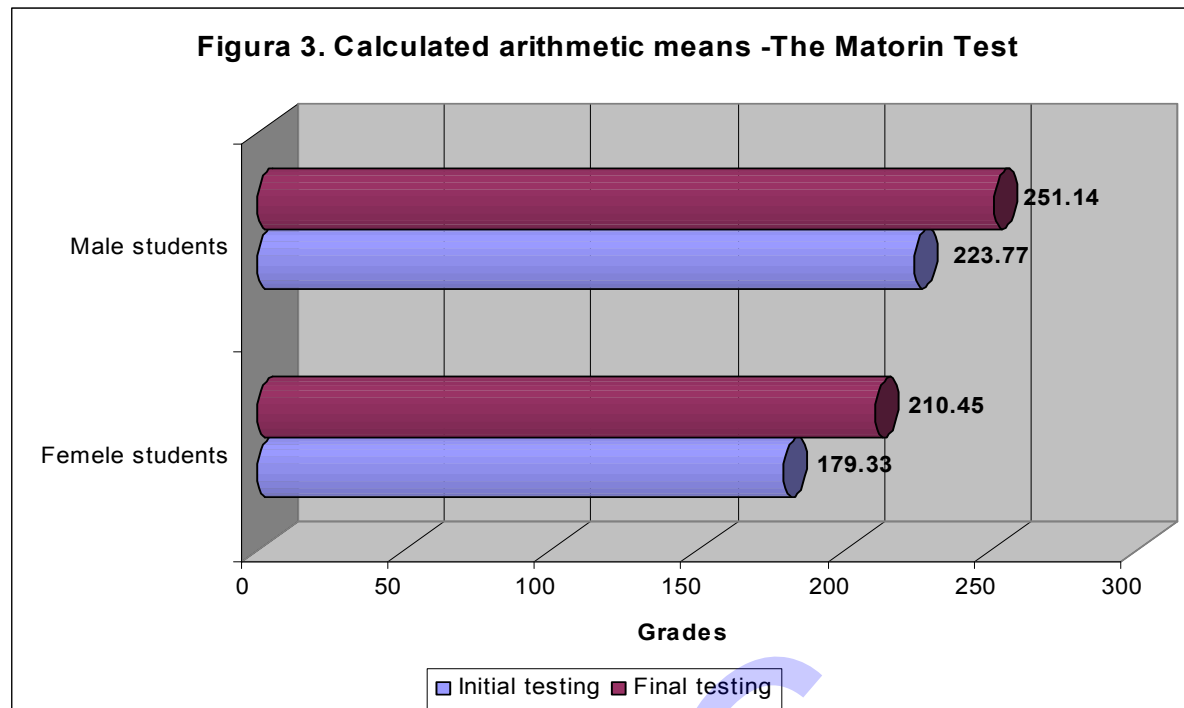
The Matorin Test

• *Female students.* By calculating the arithmetic mean (table 1, figure 1), $X = 179,33$ degrees, after the initial testing and $X = 210,77$ degrees after the final testing, we notice a progress of 31,44 degrees.

The calculated variability coefficient (table 1) frames the pattern, after the two tests, as having a high homogeneity.

By calculating the value of “t”, (table 1) that aimed the significance of the difference between the means, where $t = 28,32$, higher than tabular “t”, so the difference between the two means is significantly different in a percentage of 99%, chance interfering in a percentage of 1% at the significance level $p < 0,01$.

• *Male students.* By calculating the arithmetic mean (table 1, figure 1), $X = 223,77$ degrees, after the initial testing and $X = 251,14$ degrees after the final testing, we notice a progress of 27,37 degrees, but less significant than in the case of female students.

Figura 3. Calculated arithmetic means -The Matorin Test

The calculated variability coefficient (table 1) frames the pattern, after the results from the two tests as having a high homogeneity.

By calculating the value of “t”, (table 1) that aimed the significance of the difference between the means, where $t = 8,68$, higher than tabular “t”, so the difference between the two means is significantly different in a percentage of 99%, chance interfering in a percentage of 1% at the significance level $p < 0,01$.

Conclusions

- Using in a larger percentage the means specific to the coordinative capacities development – equilibrium, also the working conditions variability during the physical education class, have contributed to the improvement of the calculated arithmetic means for the coordination tests – equilibrium.
- In this base we can conceive a methodical line, in the analytic program, for the development of the students’ coordinative capacities.
- The improvement of the manifestation level of the coordinative capacities – equilibrium represents a premise favourable to maintaining/perfecting the individual physical condition, rendered valuable by participating at sport competitions and being beneficial for the students’ future occupations.
- The tests characteristic to the coordinative capacities have pointed out the motor receptivity of these subjects, highlighted through the higher values obtained after applying the specific means and the second measurement.
- Even if in time, by accumulating a significant data base of the respective tests during the university physical education class, these will be at a low level, remaining a starting and reporting point for the new researches.

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ORIGINAL RESEARCH

THE CORRELATION BETWEEN THE PHYSICAL TRAINING AND THE SPORT PERFORMANCES IN SPEED SKATING AT CHILDREN

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Abstract

Sport practice at an early age is a problem of high actuality, this being debated intensely by specialists, the solving of the problem in cause being appreciated as a highly important factor in the general conception of the complex process of sport practice, in this process a very important role being held by the physical training.

The present paper approaches the complex problem of the connection between the physical training and the sport performances at children through an experiment realized on 6 speed skaters, 4 boys and 2 girls, with ages of 8-9, experiment that had as purpose the demonstration of the importance of the multilateral physical training at skaters of an early age, of course without excluding the importance of the other factors necessary for superior results.

Through the obtained results we proved that there is a direct connection between the physical training and the sport performances at children, knowing that the superior results in speed skating, on a long period, depend also by the training quality at an early age.

Key words: correlation, physical training, sport performances, speed skating.

Introduction

As we already know, the sport practice at an early age is an actual problem and intensely debated by the specialists, the specialty literature lately starting to pay sufficient attention to this problem which is rather delicate, its solving being appreciated as a highly important factor in order to obtain top results at a worldwide level.

Renato Manoo (1996) defines sport practice as being “a complex process of intervention, of which purpose is to learn and improve the technique, under the simple or chained form, for an individual, a group or a team, and that aims at the development of the physical-psychic allowing to reach certain maximum sport performances, taking into account the subject's, group's or team's potential” [4, pg. 26].

Also, Dagnea A. (2002) considers that the process of sport practice as “a complex process developed systematically and continuously gradual, of adaptation of the athlete's organism at intense physical and psychic efforts, implied by his participation in competitions” [1, pg. 155].

Children, in general, present differences considered rather important both from the corporal constitution point of view and from the aptitudes, attitudes etc. It is considered that the main factors that determine the success in the performance sport are: the availability for performance, the physical aptitudes, the social environment, motivation etc.

At the same time, practice at an early age, and not only, can be understood as “a progressive reaction at systematic changes in the practice task and the determination of certain changes in the physical condition (*fitness*) and the fatigue level” [2, pg. 131].

It is considered that the tendency to lower the selection age has been made on the basis of perfecting the sport orientation systems and of motor evaluation also of the improvement of training methods and techniques [4, pg. 173].

The training of athletes of an early age must differ from the one of adults, the main characteristics of this complex process being [3, pg.69]:

- Training stages must be different from the adults' ones.
- The division into periods of the practice must be adapted and planned according to age particularities.
- Practice must not surpass the true needs of athletes.
- Sport practice at an early age must be adapted depending on the development and the maturity of the respective athlete.
- An inadequate motivation can lead to the progressive decrease of athlete's interest for the respective sport branch.
- The appearance and perpetuation of a stress state has as result the faulty learning of the technique, also the maintenance of the different motor problems existent at this age, etc.

Also, Martin D. and Nicolaus J. (2000) consider that, from the point of view of the contents and practice conceiving at an early age, this contains three tasks [5, pg. 104-107]:

- To discover talented athletes and promote them.
- Long term training of the performance to be initiated in an adequate manner, to develop multilaterally but, at the same time, specific depending on the practiced sport branch.
- Performance objectives must be chosen depending on the effort's capacity that all children have, taking into account the age and sex particularities.

Practice, in general, can be seen as being so general, and specific, the specific practice basing on the general one. At the superior levels of training for speed skating, and not only, we discuss at a superior level (from a scientific point of view) about the specific practice's gravity in comparison with the general one.

Speed skating practice is based, especially, on the relation between fatigue and recovery. It is known that made practices on a certain period of time, by successive cycles of practice, chosen depending on the athlete's particularities, can lead to an ascending increase of the performance level, of course based on a correct relationship with the recovery process. Through this alternation of quantitative, qualitative accumulations and of recovery special results can appear, in time, only if these have at their base scientific methods very clearly limited, especially at an early age.

Material and methods

In elaborating the present paper I started from the premise that, speed skating, in addition to this the majority of sport branches, it is susceptible to be perfectible by continuous study of its components, physical training being one of the most important. This experiment started from the research hypothesis that if we realize an adequate physical training, in concordance with the age and sex particularities, then also the results will be superior, being so a direct connection between the physical training and the sport performances at children, in speed skating.

The study we are talking about has been made in 2005-2006 on 6 speed skaters, 4 boys and 2 girls, with ages of 8-9, legitimated at the Petroleum Club of Ploiesti, experiment that had as purpose the demonstration of the importance of the multilateral physical training at skaters of an early age, of course without excluding the importance of the other factors necessary to the appearance of superior results.

The experiment had been axed on the evaluation of the main aptitudes necessary for practicing speed skating, through the tasks specific to land, that were: speed running on 50 m. plat, commutation (running on 10 m, turning back and running on the same distance – 10 m – until the start line), length jump from standing, consecutive jumps from skating position (5 left – 5 right), abdominal musculature strength (from dorsal lying position lifting up the stretched legs and close until vertically and coming back) – there are being made under timing in 30 sec., mobility, simulator (the number of skating steps realized in 30 sec had been tested), resistance running on a 400 m distance. Each of these results had received a certain score, on the basis of existent tables at the specialty federation, resulting a total score for every athlete.

Also there had been calculated the obtained times at the tasks of 100 m and 300 m obtained at the Children's National Championship – on tasks and polyathlon, which was held at Miercurea Ciuc on the 24th-26th of January 2006.

The 6 skaters have been divided in two groups, that is: an experimental one made of Mănescu Pedro Andrei, Dinu Silviu și Fierar Andreea and a control one made of Bălăceanu Gabriel, Lambriu Eugen și

Iordăchescu Patricia. The first group has been preparing after a practice schedule with a total percentage over a calendar year (these varying over the entire year depending on the practice steps they were at) of 55% physical practice, 30% technical practice, 10% tactical practice and 5% mental and psychological practice, while the second group had a total percentage of 45% physical practice, 30% technical practice, 15% tactical practice and 10% mental and psychological practice.

At the end we compared the total scores obtained both by the boys and girls at the land tasks with the obtained results at the Children's National Championship – on tasks and polyathlon.

Depending on the obtained results at the championship the correlation between them and the obtained results at the physical tasks specific both graphically and in written.

The used research methods and techniques have been: the experimental method, the measurements and recording methods, the bibliographic study method, the statistic-mathematic method and the graphic method.

The obtained results and discussions

The results of the physical tests (on land) specific to speed skating are presented in the tables 1 and 2, and the total scores of these tests are presented in the tables 3 and 4, arranged scores in a descending order. In tables 5 and 6 there are presented the obtained performances at the Children's National Championship – on tasks and polyathlon, both at boys and girls, such as the total scores and the differences of scores obtained by the 6 athletes at this competition.

Table 1. Physical tests results – boys

Nr. Crt.	Name and surname	50 m. (sec.)	Commutation (sec.)	Jump in length from standing (cm.)	Consecutive jumps from skating position		Abdomen	Mobility	Simulator	Resistance (min.)
					Left (cm.)	Right (cm.)				
1.	MPA	8,8	11,3	180	835	830	30	+11	28	1,30
2.	DS	8,9	11,3	175	825	830	30	+5	27	1,30
3.	BG	9	11,4	170	850	870	30	+1	25	1,31
4.	LE	9,5	11,8	165	740	750	27	+12	25	1,33

Table 2. Physical tests results - girls

Nr. Crt.	Name and surname	50 m. (sec.)	Commutation (sec.)	Jump in length from standing (cm.)	Consecutive jumps from skating position		Abdomen	Mobility	Simulator	Resistance (min.)
					Stânga (cm.)	Dreapta (cm.)				
1.	FA	9,7	12,1	150	750	775	28	+11	21	1,38
2.	IP	10,4	12,3	145	705	700	20	+12	21	1,57

Table 3. The total score obtained at the physical tests – boys Table 4. The total score obtained at the physical tests - girls

Nr. Crt.	Name and surname	Total score of the physical tests
1.	MPA	650
2.	DS	620
3.	BG	575
4.	LE	555

Nr. Crt.	Name and surname	Total score of the physical tests
1.	FA	570
3.	IP	485

Table 5. Obtained performances at the Children's National Championship – on tasks and polyathlon, 2006 - boys

Nr. Crt.	Name and surname	Day I		Day II		Total score	Score difference from the first	Place
		100 m. (sec.)	300 m. (sec.)	100 m. (sec.)	300 m. (sec.)			
1.	Mănescu Pedro Andrei	13,71	36,08	13,79	37,40	100,980	-	1
2.	Dinu Silviu	13,62	37	13,89	37,86	102,370	1,39	2
3.	Bălăceanu Gabriel	14,39	37,84	14,36	38,87	105,460	4,48	3
4.	Lambru Eugen	15,1	39,78	15,03	40,47	110,380	9,40	4

Table 6. Obtained performances at the Children's National Championship – on tasks and polyathlon, 2006 - girls

Nr. Crt.	Name and surname	Day I		Day II		Total score	Score difference from the first	Place
		100 m. (sec.)	300 m. (sec.)	100 m. (sec.)	300 m. (sec.)			
1.	Fierar Andreea	14,94	40,71	15,60	40,39	111,64	-	1
3.	Iordăchescu Patricia	16,01	43,05	16,17	43,01	118,24	6,60	3

Figure 1. Obtained results at the tasks of 100 m.- boys

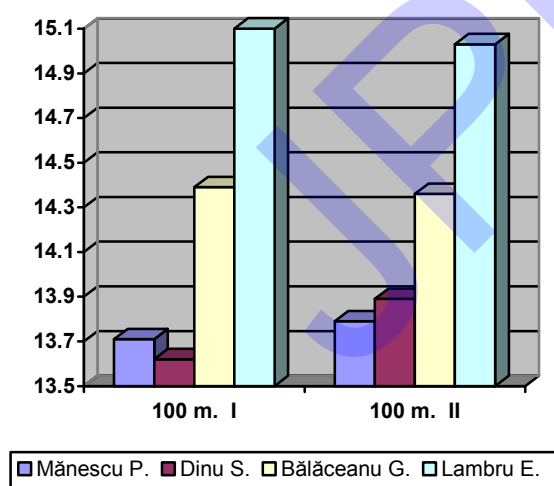


Figure 2. Obtained results at the tasks of 300 m.-

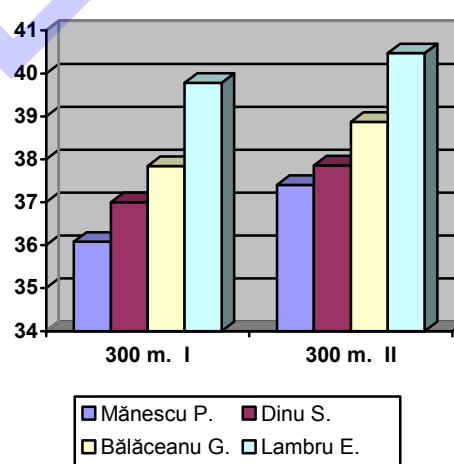


Figure 3. Obtained results at the tasks of 100 m.- girls

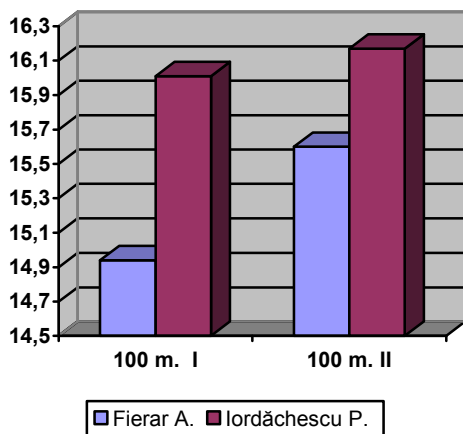


Figure 4. Obtained results at the tasks of 300 m.-

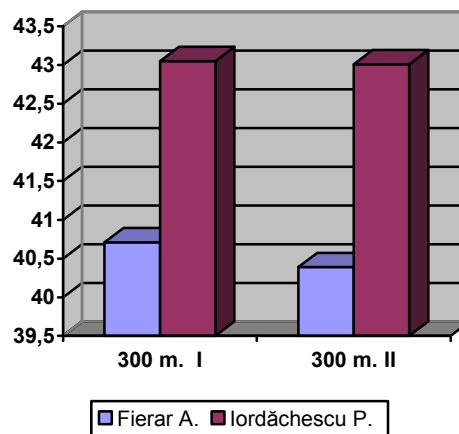


Figure 5. Total score obtained at the Children's National Championship - polyathlon (boys).

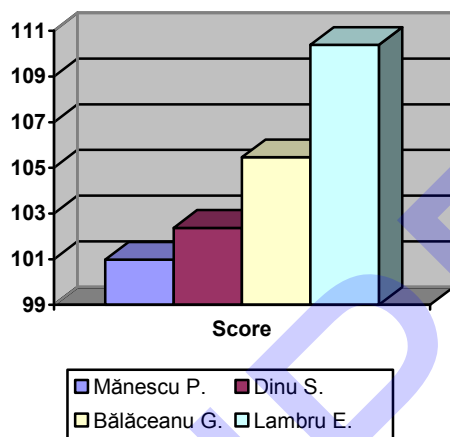
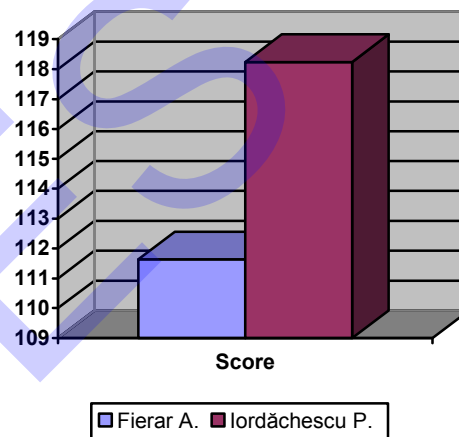


Figure 6. Total score obtained at the Children's National Championship - polyathlon (girls).



Relating to figures 5 and 6 we must make the explanation that the lower the obtained score (that is realized summing the seconds of all the made tasks by the researched subjects), the better the realized times by the researched results.

Figure 7. Compares the contribution of each value for the total across the categories - boys

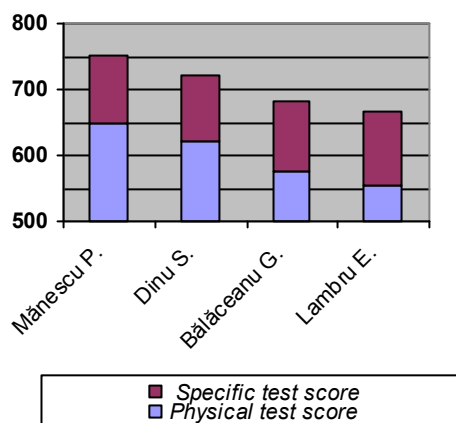
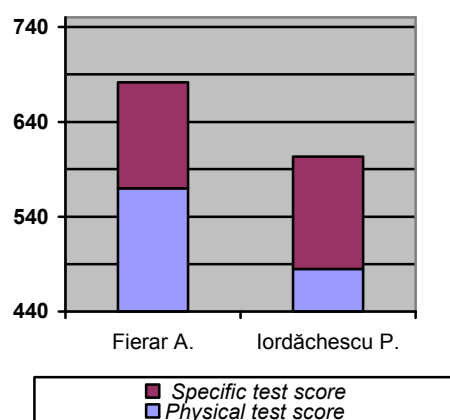


Figure 8. Compares the contribution of each value for the total across the categories - girls



In figures 7 and 8 we can see clearly the difference between the 6 athletes – four boys and two girls – by comparing the contribution of the obtained values of the researched subjects, on the basis of the two types of scores – physical and specific, at a total score, making the mention that the higher the score of the physical results (so better), the lower (better times) the score of the specific tests (sport tasks).

From the obtained and interpreted data we can notice the superiority of the results from the experimental group towards the ones obtained by the control group, this thing being due especially to the physical training.

Conclusions

1. As we notice from the obtained data and previously presented athletes from the experimental group, that had a higher percentage of the physical training, 55% in comparison with 45% from the control group, had a superior score at the physical tests in comparison with those from the second group, the same tendency being noticed also at the sport tasks at which they participated, the technical practice percentage being identical at both groups.

2. We can say that there is a direct connection between the physical training and the sport performances at children, this connection being of a positive nature as long as there is kept between certain clearly delimited limits, scientific ones, the use of methods, of the specific elements, also the quality and quantity of the practice tasks should be realized in concordance with the development level of the children, so, taking into account their particularities.

3. The appearance of superior results in speed skating, on a long period of time, depends also on the quality of the training at an early age, ignoring this conception meaning putting in danger the practice level from later.

4. General and specific physical training has clear implications in accomplishing the objectives of the modern sport practice.

5. At this level we can say that the higher the score of the physical tests (so better), the lower the score of the specific tests (sport tasks), and so better times had been realized.

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ORIGINAL RESEARCH

THE ROLE OF LEG AND TRUNK MUSCLES PROPRIOCEPTION ON STATIC AND DYNAMIC POSTURAL CONTROL

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The proprioception information is a prerequisite for balance, body's navigation system, and the movement coordinator. Due to changes between the angles of ankle, knee, and hip joints the aforementioned information are important in the coordination of the limbs and postural balance. The aim of this study was to investigate the role of leg and trunk muscles proprioception on static and dynamic postural control. Thirty males students of physical education and sport sciences (age = 21.23 ± 2.95 years, height = 170.4 ± 5.1 cm, and weight = 70.7 ± 5.6 kg) participated in this study volunteered. Vibration (100HZ) was used to disturb of proprioception. Vibration operated on leg muscle (gastrocnemius) and trunk muscles (erector spine muscle, at L1 level). Leg stance time and Star Excursion Balance Test were used for evaluation of static and dynamic postural control respectively. Subjects performed pre and post (with operated vibration) leg stance time and star excursion balance test. Paired sample test used for investigation the effect of vibration on leg and trunk muscles in static and dynamic postural control. Result of this study showed in static postural control, there is no significant difference between pre and post test (operated vibration) in leg and trunk muscles ($p \leq 0.05$). In contrast there is significant difference in dynamic postural control between pre and post test in leg muscles in 8 directions of star excursion balance test ($p \leq 0.05$) while there is only significant difference in trunk muscle in antrolateral and lateral of star excursion balance test ($p \leq 0.05$). During physical training such conditions like fatigue and injury can disturb proprioceptions' information. Thus, due to the importance of this information we recommend that coaches' additionally specific trainings any sport used specific exercises to enhance the proprioception information.

Key words: Vibration, postural control, Proprioception, Leg and trunk muscle.**The running head:** Role of Leg and Trunk Muscles Proprioception on Postural Control**Introduction**

Aspects of neuromuscular control may be quantified through measures of postural control. Postural control can be defined as either static (maintaining a position with minimal movement), semi-dynamic (maintaining a position while the base of support moves), or dynamic (maintaining a stable base of support while completing a prescribed movement) (Winter et al, 1990).

In order to produce appropriate force, and control the balance in a timely manner the central nervous (CNS) system requires the exact position of the body in space both in stationary and dynamic situations. The CNS must coordinate the incoming information from the sensory receptors in order to identify the body's position in space (Akuthota et al, 2004). Body's movements and its position in space in relation to its surroundings are detected naturally by several means such as vision, somatosensory sensations (deep, subcutaneous receptors, joints and muscles), and vestibular which are then interpreted by the CNS. Each one of these sensational systems relay

specific information about the body's position in space; therefore, each system acts as an independent information centre for the CNS (Akuthota et al, 2004).

Vision is responsible for the head's position and movement in relation to the surrounding objects. Via various directional head movements the distance between objects, head and eyes are detectable with the vision system. Information acquired via vision is important for maintaining balance (Akuthota et al, 2004). The somatosensory system relays the relevant information about body movements in space in relation to a stable surface to the CNS. In addition, the somatosensory system detects the relationship between the various limbs in the body. The receptors of this system include muscle spindles, Golgi tendon organs, joint receptors, and subcutaneous receptors (i.e., vibration, touch, pressure and stretch sensations) (Capicikova et al, 2006).

The human balance control system aimed at the achievement of two behavioral goals: postural orientation and postural equilibrium (Horak et al, 1996 and Richard et al., 2005). Postural orientation refers to the position of the body with respect to gravitational vertical and it is characterized by body tilts from the vertical position. Postural equilibrium refers to body balance around equilibrium point, i.e. the configuration where all forces acting on the body are balanced in the desired body vertical position (Hay et al, 1996).

Proprioceptive inputs from postural muscles, particularly from leg postural muscles, are important information in human postural control (Rogers et al, 1985). The balance control process can be influenced by vibratory stimulation of postural muscles (Rogers et al, 1985). Vibration of leg postural muscles evokes kinesthetic illusion of movement in standing subjects and it results in a postural response known as vibratory induced falling (Eklund, 1973). The induced body tilt can be characterized as involuntary body lean in the direction of vibrated muscles (Hayashi et al, 1981). Vibration applied to a muscle increases the firing of muscle spindles which inform the central nervous system that the muscle is being stretched (Roll et al, 1989).

Vibration almost selectively activates the primary terminations of the muscle spindle, very much as a tendon tap does (Roll et al, 1989). Continuous muscle vibration has powerful effects on upright stance that are partly connected to the subject's reactions to the illusions of movement produced by vibration (Roll et al, 1989). During stepping-in-place, hamstring muscles vibration produces involuntary forward stepping, and during treadmill locomotion involuntary step-like increase of walking speed (Ivanenco et al, 1999). During blindfolded walking, minor though significant changes in kinematics of lower limb segment are induced by bilateral continuous vibration of the extensor muscles of the legs (Biguer et al, 1988). Symmetrical vibration, though, can give no information on potential effects on the orientation of the locomotor path. In the case of neck muscle, asymmetrical vibration induces displacement of the subjective straight-ahead (Biguer et al, 1988) and trajectory deviation during walking or body rotation during stepping-in-place, both opposite to the vibration side (Biguer et al, 1988). Therefore, the aim of this study was to investigate the role of leg and trunk muscles proprioception on static and dynamic postural control

Methods

Thirty males students of physical education and sport sciences from Guilan University (age = 21.23 ± 2.95 years, height = 170.4 ± 5.1 cm, and weight = 70.7 ± 5.6 kg) participated in this study volunteered. All volunteers were healthy without experiencing any difficulties in their balance. To ensure that subjects were all healthy and without any previous injuries a health questionnaire was filled by each subject. After completing the consent form, the experiment was explained in details to the subjects. A vibration device was used to disturb the proprioception. This specific vibration device (100 Hz) was made by an Iranian company to fulfill the goals of this experiment. For disturbance of proprioception the vibration was imposed on the erector spine muscle, at L1 level, about 5cm from the midline and leg muscles. To access the dynamic and static postural control star excursion balance test and leg stance time were utilized. After familiarization with the tests, subjects warm up for 5 minutes prior to the actual test. The warm up consisted of specific stretching routine for the following lower body muscles: hamstrings, gracilis, gluteus, quadriceps, and soleus.

Star excursion balance test

This is a test that incorporates a single-leg stance on one leg with maximum reach of the opposite leg. The test is consisted of 8 lines that make a 45 degree angle to one another. The 45 degree increments are from the center of the grid. The 8 lines positioned on the grid are labelled according to the direction of excursion relative to the stance leg (anterior, anterolateral, anteromedial, medial, lateral, posterior, posterolateral, posteromedial) (Blackburn et al, 2000). The diameter of the circle is 182/9 cm, and it is placed on a firm surface. The width of each line is 7/62 cm. In order to reduce the learning effect each subject choose 6 directions out of the 8 to practice (Kinzey et al, 1998). The subject stood in the middle of the circle with the dominant leg; then with the opposite leg he reached for the furthest marked distance (Figure 1). Each subject was asked to touch the furthest part of the line with the most distal part of his reach foot. This was done with control and in a slow manner to ensure adequate neuromuscular control of the stance leg. The subject then returned to the original stance and the touch points that were marked during examination were recorded. Three second rest were allocated between each reach. The direction of the revolution based on the right or left reach legs was clock wise and counter clock wise, respectively (Kinzey et al, 1998). The reach was not accepted if the leg could not touch the target line, if

the subject's weight was shifted to the reach leg, if the support leg was lifted from the center, or if balance was disturbed during the reach (Kinzey et al, 1998).



Figure1. a subject performing the posterior-reach component of the Star Excursion Balance Tests.

Single leg stance

Subject stand on one leg, his or her arms place across his or her chest with his or her hands touching her or his shoulders and his or her legs don't touch each other. Subject should look straight ahead with his or her eyes open and focus on an object about 3 feet in front of him. Ideally do this with the shoes off. The *Criteria to stop timing the test contain of*: The legs touched each other, the feet moved on the floor, their foot touches down, or the arms moved from their start position.

Results

Result of this study showed in static postural control, there is no significant difference between pre and post test (operated vibration) in leg and trunk muscles (table 1). In contrast there is significant difference in dynamic postural control between pre and post test in leg muscles in 8 directions of star excursion balance test (table 2) while there is only significant difference in trunk muscle in antrolateral and lateral of star excursion balance test (figure 2).

Table1.results of t test for cooperation pre and post test in leg stance time in second

Groups muscles	Mean Standard Deviation	t	Degree of freedom	p
Leg muscles	Pre-test 19.23±6.67 Pre-test 14.26 ± 5.21	-1.25	29	0.09
Trunk extensor muscles	Pre-test 20.15±7.31 Pre-test 16.64 ± 6.25	-1.12	29	0.12

Table 2.The results for the t test correlation with respect to the reached distance in centimetre for pre and post test (with vibration) in dynamic balance.

Directions of SEBT	Mean Standard Deviation	t	Degree of freedom	p
Anterior	Pre-test 85.25 ± 5.3 Post-test 83.4 ± 6.2	1.21	29	0.08
Anteromedial	Pre-test 91.32±5.4 Post-test 89.1 ± 5.9	1.2	29	0.09
Medial	Pre-test 91.4 ± 7.6 Post-test 89.4 ± 6.5	1.33	29	0.12
Posteromedial	Pre-test 99.1 ± 8.1 Post-test 97.3 ± 7.6	1.41	29	0.08
Posterior	Pre-test 95.4 ± 9.7 Post-test 92.47± 8.3	1.7	29	0.1
Posterolateral	Pre-test 92.4 ± 8.7 Post-test 90.12± 10.12	1.25	29	0.09
Lateral	Pre-test 61.23 ± 8.1 Post-test 55.3± 7.2	2.66	29	0,03*
Anterolateral	Pre-test 88.9 ± 7.5 Post-test 73.2 ± 7.4	3.51	29	0.001*

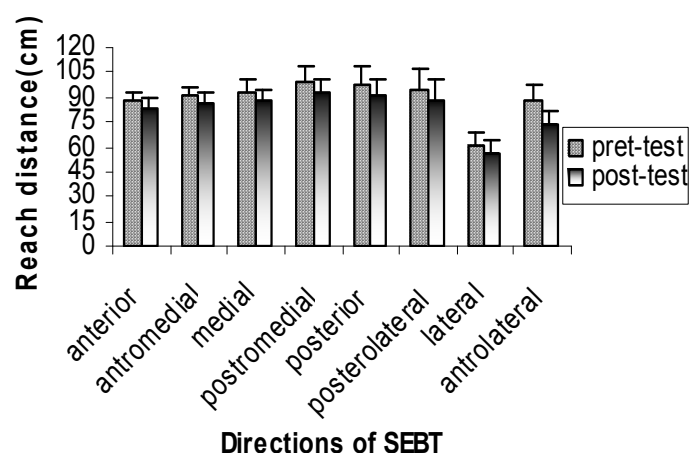


Figure 2. The mean comparison of the pre and post test for the distance in the eight directions of the dynamic balance in trunk extensor muscles

Discussion

The purpose of this study was to evaluate the role of leg and trunk muscles proprioception in static and dynamic postural control. The Result of this study showed in static postural control, there is no significant difference between pre and post test (operated vibration) in leg and trunk muscles. In contrast there is significant difference in dynamic postural control between pre and post test in leg muscles in 8 directions of star excursion balance test while there is only significant difference in trunk muscle in antrolateral and lateral of star excursion balance test. Many studies have analyzed the sensory adjustments and coordination in the movement control (Susco et al, 2005, Karnath et al, 2002) and the consensus is that the information is integrated cumulatively. Therefore, disturbed leg muscle information could be one method of proprioception interpretation; as a result it could cause an error in the superior system. During movement this error could cause deviation from the path; this previously has been demonstrated by the non-continuous stimulation of the neck muscles (Susco et al., 2005; Karnath et al, 2002, Mergner et al, 1997).

In postural control involves vision, vestibular and somatosensory systems. The defection in any system results in disturbing of balance but if the defection compensate by other system, person may maintaining his or her balance. It seems that in static postural control because person has minimum movement in his or her base of support, the defection create in balance by vibration, compensate by other system then, there was no significant difference between pre and post test in static postural control. In general the proprioception information is a prerequisite for balance, body's navigation system, and the movement coordinator (Bove et al, 2001). Due to changes between the angles of ankle, knee, and hip joints the aforementioned information is important in the coordination of the limbs and postural balance. In fact human body uses the proprioception information in order to respond to the changes in body's position (Bove et al, 2001). Thus, disturbances in this information in any form or shape cause disruption in balance (Kavounoudias et al, 1999). It seems that changes in the entrance of afferent sensory pathways cause changes in the control of the lower body muscles. Additionally, it is known that changes in entrances of afferent from the receptors in the muscle causes reduced ability of the control over the lower body limbs (Ashton-Miller et al, 2001). Inability of nervous system to relay signals is due to the muscles' inability to respond to the stimuli. Vibration could possibly influence the receptors and causes change in the motor path way and in turn control the posture. It seems that vibration influences the muscular tissue more than joints' receptors and the activities of the proprioception such as muscle spindles and Golgi tendon organs are reduced. Possibly this nervous/muscular deficiency on muscular control of the lower body has a negative effect on the ability to reach the marked distance; as a result the reach is reduced in post-test compared to the pre-test.

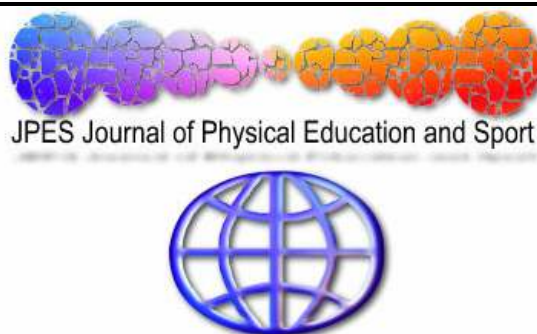
Conclusion

With regards to the results of this research, it seems that vibration can have a disturbing effect on dynamic posture and this point demonstrate how important the proprioceptions' information of the leg and trunk muscles are in the control of dynamic posture. During physical training such conditions like fatigue (Nicolas et al, 2007) and injury (Amy et al, 2005) can disturb proprioceptions' information. Thus, due to the importance of this information in the control of the dynamic balance, we recommend that coaches use specific exercises to enhance

the proprioception information. Although it is not realistic to expect a coach to stop practice or decrease practice times because someone is experiencing fatigue which may lead to injury, this topic needs attention. To be realistic, most coaches could rearrange how practices are conducted. For example, a coach who is having three hour gymnastic practices could schedule the more difficult and higher risk activities in the first half of practice and leave the lower risk activities for the last hour when the athletes will be feeling the effects of fatigue.

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SHORT REPORT

DISABILITY OF 'STUDENT IN SCHOOL AGE...

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Schools should play a significant role in spreading the message understanding and acceptance of disability rights, helping to dispel fears, myths and prejudices, supporting the efforts of the whole community. Should develop and disseminate educational resources to support students to develop an awareness individual's disability or that of others, helping them to consider in a positive diversity. It is necessary to achieve the goal of 'education for all in compliance the principles of full participation and equality. Education has a role instrumental in building from future for all, both for the individual, both for the person as members of society and the world of work. The education system must therefore be the central place that will ensure personal development and social inclusion, that allows children and young people to be as independent as possible. The education system is the first step toward a society of 'integration. [the Declaration of Madrid, Non-discrimination as affirmative action equal social integration, Madrid, 2002]

Keyword: disable, school, learning, playing, integration

Abstracts

The school, despite the great transformations in recent years that have made it more problematic than before, remains a fundamental and indispensable reference point in the growth of children. It constitutes a central sector of society that contributes to the harmonious development of personality of the individual.

From the educational point of view, there is neither age nor schools that are not essential for the construction of their own life project. The need to know, try and open up to new learning experiences accompanying the entire life of a person. At all stages of life, we must encourage the individual to the best, taking into account the facets of his personality and his ability to transform into real skills. Therefore, if someone could not enjoy adequate educational demands, has the right to be enabled to recover them. Because if it is true that the functions exercised tend to atrophy, or at least to weaken, it is also true that the flexibility and complexity of the mind and human experience is such that, for life, recoveries, and even progressive improvements general and specific personality and quality of its culture.

Disability.**1.1 The importance of education in the growth process of the individual.**

The school, despite the great transformations in recent years that have made it more problematic than before, remains a fundamental and indispensable reference point in the growth of children. It constitutes a central sector of society that contributes to the harmonious development of personality of the individual.

From the educational point of view, there is neither age nor schools that are not essential for the construction of their own life project. The need to know, try and open up to new learning experiences accompanying the entire life of a person. At all stages of life, we must encourage the individual to the best, taking into account the facets of his personality and his ability to transform into real skills. Therefore, if someone

could not enjoy adequate educational demands, has the right to be enabled to recover them. Because if it is true that the functions exercised tend to atrophy, or at least to weaken, it is also true that the flexibility and complexity of the mind and human experience is such that, for life, recoveries, and even progressive improvements general and specific personality and quality of its culture.

The individual educational process, in fact, begins with the life and ceases only with it, in a continuing dynamic of conquest and possible involutions, so nothing is never won once and for all and nothing is ever gone forever. This certainty is also a powerful factor of encouragement and confidence in their abilities, from those who are "differently abled". There is, moreover, no situation of disability which could reduce the integrity of the person to some of his deficit. No person is defined by subtraction.

The outlook calls for more education, in fact, every individual's capabilities and exploit all available resources in the different evolutionary processes: the only way it becomes possible that a balanced development, leveraging on the strengths of one, can develop weaknesses, especially in those situations that are still folded in on themselves.

Education is therefore the enemy of any bias and requires constant harmonious development, comprehensive and integrated all the dimensions of the person and in all stages of life. Consequently, the educational dimension in the training of the disabled person, must be designed to respond to special educational needs in all situations in which they occur. The interpretation of disability requires, therefore, a dual focus: to the person who expresses the needs and to the environment, physical and social, in which the needs are given. The reduction in disability, which is the primary purpose of the educational process, is played on these two polarities: the attention to individual needs and adaptation / adjustment of the context.

The disabled. The term "differently able" has been used to reflect on the fact that every person, more or less able, if it is enabled to bring out the best, in an environmental report, expresses skills and abilities that go beyond appearances tied to a chair with wheels, to crutches to cane.

This definition highlights, therefore, all the skills that each individual is a carrier and that, therefore, precisely because they refer to an individual person, are different. Personalization of interventions, then makes the activity targeted specifically to each individual. But who is the real disability?

May be a disability who with the right tools, it is placed in a position to make up for their disability? The idea of disability can also be introduced for people generally considered normal when the computer does not know how to use in this age of information technology or know how to drive, now essential to get there, or do not have the capacity to adapt to changes, seeking new knowledge.

Well you have to be first person and then disabled, one must believe in what we have and we can. In this direction is a tendency to give more quality to life and greater respect for diversity, overtaking him emotionally and practically, so value it.

1.3 What is meant by disability today.

In the existing documents of the World Health Organization (ICF-DH-2, renamed ICF, International Classification of Functioning Disability and Health, published in May 2001) on disability and handicap, the word disability is used to the keyword operation to indicate three fundamental dimensions that affect the disabled person: the body (impairments of structure, equipment and systems), activity (limitations on activities, from simple to more complex), participation (restrictions and barriers to participation).

The questions to answer becomes: what are the structures and functions compromised? How to effectively carry out different activities an individual? What is the experience of involvement of an individual in a given social situation and to a certain health condition?

The ICF does not classify people, but analyzes the characteristics of health within the context of their individual life and environmental impact. This document therefore represents a cultural change with regard to the assessment of health status as it considers inextricably linked the complex relationship between body, mind, environment, context and culture. This turnaround is also highlighted by the introduction of new terms, especially terms disability / handicap, which are replaced by activities and social participation. It is the interaction of the characteristics of the health and environmental factors that causes the disability, rather than the deficit reported to the individual (with the risk, in this second case, to identify the person with his disability).

Disability can then be understood in a perspective of "equality" of solidarity, based on the concept of diversity as a normal human condition: what happens today someone, it could happen tomorrow to any of us through an illness, an accident, or as a natural consequence of the aging process.

In this sense, the dimension of integration, knowledge deficits and learn to accept the handicap for rejection, and even reduce it to not add any new ones, becomes a central point in the planning of any educational intervention. The prospect of integration is one that is not content distinctions in categories, but try to see people individually, each with their own needs, and to understand the originality and sharing. The integration is, therefore, in this sense, a shift opposite to that which leads to segregation, certainly tortuous and difficult but absolutely essential for a school that wants to call worthy of the name.

2. Motor activity and Disabled.

2.1 The value of mobility for persons with disabilities.

Sporting activity manifests the need of the body to express itself, the movement is a vital need in all ages of man. Through sport, the disabled person, like everyone else has a chance to improve their coordination, strength, endurance, speed, to improve their skills, their willingness to train and learn to overcome fatigue. From a psychosocial standpoint, the sport socialization, encourages all 'commitment, stimulates the nerve, promotes loyalty and encourages interpersonal communication and collaboration.

For all this to happen we must ensure that sport is a function of person and not vice versa. The place where you can practice sport must be an environment in which friendship, cooperation and team spirit are the basis of interpersonal relationships and the achievement of the result is only an incentive to improve themselves. The roots of this positive approach to sport, which can be recognized for both the disabled person and for the able bodied, they are in school and in particular in the educational dimension through the motion that the school must provide an early stage.

On the pedagogical level, it is appropriate that sport, in the case of the disabled person is freed from moving an end in itself. The practice of physical activity should be targeted, with regular checks, and must be considered an important means of training because it allows the person to bring into play not only his physical and mental ability, but also to experience ethical and social values.

In particular, motor activity for disabled people has a great recreational value which is a motivation and a push to experience joy and pleasure in life, sharing this with others. The ability to retrieve the contact with the surrounding world is one of the most important goals of sport for disabled people. In this scenario education and sport are two terms are intended to closely intertwined: the education aims to transform the potential of the individual in the traits that characterized his personality, the sport is to express personality through the drive and the game.

Physical activity also gives the disabled person the opportunity to recover a body, returning the body to its importance. In this way the disability ceases to feel the body as a foreign object to be entrusted to others, but gives him back his own purposes. Practice and sport can therefore help to discover themselves and to satisfy the need for autonomy and independence.

2.2 The adapted physical activity.

Currently in education, scholastic and extracurricular activities, leisure and recreation, adapted physical activity is seen as a teaching strategy that can encourage people with special educational needs, the process of growth in all the dimensions of personality (motor, cognitive, emotional, social), encouraging them to adopt attitudes and lifestyles correct.

The systematic practice of physical activities and sports by increasing number of customers has posed new challenges educational psychology, sociology and methodology in order to allow everyone to perform physical activities and sports, according to the inclinations, capabilities, potentials and needs of each. Access to the practice and sport is now an 'obligation' legal systems and slowly involving international institutions, European and national. This has led to increasing attention towards physical activity, which is currently a fast growing industry that involves an increasingly broad and diverse, allowing also the elimination of stereotypes associating the activities only to the disabled population ..

When we speak of Adapted Physical Activity (APA in English, Adapted Physical Activity) "refers to any movement, physical activity and sport departing from interest, skill or individual capabilities and can be practiced by individuals limited in their mobility by deficient physical, psychological, or mental or alteration of several major functions. " The adapted physical activity ie constitutes a body of interdisciplinary knowledge directly to solve problems that occur during psychomotor learning life. These problems can be individual or environmental. This means that the adapted physical activity includes both attitudes to support individual differences and adaptation, is a developmental system of services designed to improve the problems. It includes knowledge from different disciplines, uses them in an integrated and complementary way, using the most effective and targeted to the specific case in order to achieve or restore a balanced state of wellness and health, including through the assumption of a style of life more active.

The benefits that the adapted physical activity can bring to people with disabilities and people with special needs are now beyond doubt. People with disabilities and those needing special education, are entitled to a support system capable of ensuring the optimum development of personality and a social dynamic and aware. In this respect, social integration should be as active and participatory in order to exclude the processes of segregation and respect the following principles: non-discrimination (meet the specific values of different

individuals), equal opportunities (to remove the difficulties resulting from barriers of all kinds, including social obstacles that prevent full participation in social life), to deal with demanding situations.

Physical activity uses adjusted, therefore, the theoretical foundations of education and adopt the operational psychomotor teaching physical education and sports, it is not a discipline in itself, nor a motor branch of education is a process teaching that promotes participation and expression of people in the practice and sport, taking into account the capabilities, opportunities, difficulties, the pace of learning and development of each. It is proposed, therefore, as a personalized teaching aimed at ensuring the success of each according to their peculiarities.

2.3 The adapted physical activity in education.

The role which is currently adapted physical activity in school, is to provide an essential educational tool that improves the quality of life and provide all pupils with disabilities opportunities suited to their abilities. In all classes there are children with special educational needs, therefore, in trying to guarantee all students a balanced program of education, teachers need to adapt their teaching so as to engage and involve both the children with specific difficulties, both children with particular talents. Adapting an intervention of motor education, in fact, is not to reduce or offset the specific learning objectives and educational goals of the discipline, but make an adjustment to reflect the specific characteristics of students with disabilities. A different special needs, (eg motor, sensory, affective) are different problems for the student and the teacher and, therefore, different adaptations.

The adapted physical activity must have as main objective to develop in the students with disabilities make the pleasure of physical and mental effort, the habit to get into the game, the sense of responsibility, self-esteem, self-efficacy. It must also provide the opportunity to build a relational importance, accustoming students to live and work with others, and allow the acquisition of transferable skills in life everyday.

In planning for adapted physical activity intervention is therefore necessary to consider the student disabled person as someone who has a body and an emotional dimension, social and spiritual, who acts and who tries to solve the problems that the environment presents. Thus, the adapted physical activity represents for him the opportunity to use resources with motor, cognitive and affective needed for the body to develop their personality in all its aspects: cognitive, affective, physiological, morphological.

From a methodological point should be proposed to students with disabilities appropriate activities at their own level while considering their potential and their difficulties.

Know the strengths and weaknesses of their students is the best resource for planning a suitable job with the class and successfully manage their projects. No child should be called to address activities that may aggravate its difficulties, which embarrassed him, laying him open to failure, or wound him. In contrast, an experience that poses a degree of difficulty accessible pupil, will be significant for him and his execution will provide a sense of competence and thus contribute positively to its growth.

The lessons of motor education must, therefore, represent a space where we can experience positive, feel good and where to learn to tolerate and respect each other.

3. Educational program.

3.1 The planning of activities: the role of the teacher.

Define the content and learning objectives in a program of adapted physical activity does not require teachers to change either the design or the strategies of teaching-learning process, but requires a spirit of constant renewal of teaching practice.

In practice, education and sport do not require pupils to imitate the movements and activities, the goal is to advance all students enabling them to transform, through experience, a great variety of bodily actions, taking account of their lived body and motor. Through fun activities and cooperative, it promotes the interaction of personality dimensions, social, physical-motor, and emotional-affective, and encourages students to think in different ways through the resolution of problems and provide answers and solutions engines may depending on the skills and capacities.

In the wide range of activities and sports, those that lend themselves better and to help reduce the gap to normality / diversity are undoubtedly play activities and games (institutionalized and non-cooperative games and even games drawn from the folk tradition). Through them the teacher is able, simultaneously, to plan learning tasks and to adapt the different motor activity levels of skills and abilities of different subgroups, encouraging learning.

The role of the teacher is crucial, because for the pupil are important, not only to activities that are proposed, but also the verbal and nonverbal behavior of the teacher. The teacher, in fact, must be able to integrate and apply specific knowledge in the different disabilities, and knowledge to adapt and manage group activities.

The teacher, in planning the various activities, will:

1. identify what skills, knowledge, attitudes, social / emotional possesses or lacks the disabled students through integrated reading the documents, functional diagnosis and the dynamic profile functional analysis of the initial situation made through systematic observation, the administration of test engines, testing structured or semi-structured knowledge. This analysis allows the assessment of motor skills, the coordinative abilities, skills conditionals (such as strength, speed and endurance, that is those physical-motor skills of the person are determined by energy factors, organic muscle and structural) and attitudes.
2. set an educational plan that draws on both the potential that the difficulties of the pupil, is trying to find a point of contact between the curriculum planning and educational profile integrated (PEI) of the pupil with a disability.
3. systematically verify the correspondence between the planned targets, objectives achieved and the process of teaching-learning process.

3.2 Proposals in methodology.

The problems that arise frequently in relation to access for disabled pupils to the practice and sport, are linked in particular: the presence of architectural barriers, the lack of availability of equipment specific sport in schools, to problems in contemporary management of the class' s disabled pupils, to lack specific training and the limited presence of support teachers during the hours of education and sport.

If all this is added the lack of awareness on the part of some families about the benefits that the practice of physical activities and sports can make in children, is even more striking the inadequacy of motor practice for people with special educational needs, thus limiting their commitment to the motor only rehabilitative

To address these issues is needed from the school, to be able to develop projects that also involve disabled pupils in physical activities and sports, with a scope that is about growth, development and maintenance of motor function in an interactive relationship with the development of cognitive and emotional with the game and the other core disciplines of the curriculum.

Among other activities, particular importance is accorded to the path psychomotor and expressive and practice of physical activities with psychosocial goals. These activities have the potential to provide educational opportunity for all pupils learn to act in the environment through mastery of his motor skills, and an even better understanding of themselves in order to gain transferable skills in areas different generations, thus, a spiral of knowledge further.

It is therefore necessary to educate the psyche and the engine. Whatever the problem, the educator, in general, will try to find different techniques for improving behavior.

He will seek:

- 1) awareness of their bodies
- 2) focus on balance
- 3) control of global coordination and segmenting
- 4) Control of breathing
- 5) structuring of body image and space
- 6) better adaptation to the outside world.

These objectives, their physical education can be pursued through a wide range of physical activities which are carried out mainly in the form of play.

In the field of teaching and education is therefore possible to perform the following activities:

- Business sense perceptual motor, which has its foundations in nonverbal communication, manipulative, plastic, graphics;
- Activities for active exploration of the environment and functional adaptation to it, centered on the conquest of motor, personal and social;
- Motor education as literacy base engine, targeted acquisition / consolidation of motor skills and development of motor skills and conditional coordinative
- Sports, competitive or not, which offer the opportunity to enjoy a spot so rewarding.

3.3 Assets to be proposed in the various age groups.

In planning the various activities is essential to take into account the age of the subjects. Motor development is, in fact, through a series of chronological stages or phases that allow the child to develop their potential and to acquire higher levels of motor activity. It is therefore important to respect these stages and according to them identify the different learning objectives, remembering that they will always intermingled with the specificity of the individual.

In the period from 6 to 10 years, you must remember that the CNS is in the phase of maximum plasticity and therefore the child is able to acquire a large amount of packaging and automation, through exercises and a global morticia .

All activities will then be directed to the structuring of motor patterns, ways of working with diverse and mostly playful. These activities must be conducted under aerobic, as it allows the exercise of moderately prolonged.

Muscle tone, for lack of specific hormones related to the maturation of sexual organs have not yet had been made, will be small. This facilitates the relaxation exercises, elastic joints (stretching) and joint mobility, particularly needed in the presence of specific disabilities. In some cases, however, the trauma causes crippling muscle tension and spasticity: in this case will be appropriate to intervene with financial liabilities, through the alternation of stretching exercises and relaxation.

The age ranging from 11 to 14 years, is the age in which it is the body image and acquire more sensitivity to the heritage kinesthetic. E 'can then consolidate large motor skills base, improve mobility, enhance the speed and frequency of movements.

In this age it is refined further development of fundamental movements such as running, el'effettuazione major athletic movements.

To improve speed, strength training might include faster, jump drills (for disability concerned) and launch (for all).

The overall strength will be increased and as regards the pace in a wheelchair, alternatives Navigating long sections at intervals of recovery, introducing, therefore, repeated exercises.

The proposed activities, always in a multivariate analysis, should therefore be designed to correct, even if adapted, somatic development, which enhances the functionality of the boy. Will then develop opportunities for aerobic work, with its enhanced cardio-respiratory system, and encouraged the acquisition and refinement of the wider range of motor skills. 15 to 18 years will instead increase its targeted expression of strength.

It will, however, should carefully evaluate the real capacity of performance of individual adolescents, to avoid excessive workload, exceeding the individual limits. It is known, in fact, too mild stimuli, especially in this period of growth, do not favor the ability of yield potential, while excessive stimulation can be harmful. A key factor will therefore be able to assess the state of development and maturation of individual children, through a thorough investigation concerning the type of injury sustained in order to identify the functional residual and called for the development with the right loads.

In the case of amputations, will be critical to intervene with targeted strengthening exercises to avoid, or at least limit, the onset of deformation compensation (eg. 's Shoulder when the arm is absent homolog). Regarding the possibility of energy, it is good to keep in mind that aerobic power is, in this period, the maximum of its possibilities.

Finally, the scheduling of work should be individualized for each student through the development of a functional terms relating to each individual and the specific type of disability.

3.4 The adaptation strategies of motor activity for students with disabilities.

When conducting activities and sports is necessary to provide appropriate conditions for pupils with special needs.

The special needs pupils should be considered right from the planning stage, analyzing the need for adjustments to both activities, equipment and environment, both the adaptation of motor tasks and rules of the game. The adaptations to be carried out may be more or less and focus on different floors.

Spaces and environments. Should reduce or expand the space so that the student can better orientation in space to be used. You need to increase the ability to access the gaming area, determine the distances and eliminate sources of distraction. Is also very important to vary the brightness of the environment and use of signals or positioning devices.

Equipment. The equipment can be changed, although you should try to use the tools as often as usual this is possible.

The tools that can be adopted include: balls, balls read or deflated balloons of different sizes or different materials (sponge, rubber, fabric); over plastic or deformable (these are minor obstacles to be overcome in various lengths so having), colored ropes of different lengths, circles of different diameters. You can also use an unconventional material to build small tools, such as sheets of newspaper or cardboard boxes to create cloths or rods to build tunnels or to mark the paths.

Task. Motor activities may be similar proposals several times in different stages of the lesson (such as the passage of the ball that can be repeated multiple times within the lesson but in different ways: passing the ball while standing still, pass the ball, running, playing the game the 10 passages). Moreover, a given activity may be aimed at achieving different objectives.

Difficulties. In some circumstances the technical skills required by a game or a year may be replaced with skills that a child with difficulty can manage more easily. The difficulty of a task can also be customized by proposing variants executive space-time (eg run forward, backward, sideways, inside and outside rims, rally, fast / slow, etc..) In order to accommodate and develop motor skills of each student. It is also important not to underestimate the abilities of disabled children, which often can be very creative about adaptation.

Rules. The inclusion of disabled children is also achieved through the adoption of small business strategies, changing some rules of the game or insert new ones. In an activity in pairs or groups the student with disabilities can be assisted by a tutor. For example, you may decide that the two play as if it were a person, or you can even decide to play all boys in pairs so as not to create differences. This trick is especially useful for pupils with visual impairment. Or playing volleyball you may decide that the ball may be stopped or contacted several times before being postponed.

Group. Organize groups of uniform levels of skills and abilities makes it more engaging learning a motor task and encourages cooperation. In some circumstances it may be useful for disabled pupils and students less able to work together, play ball type rilancialta.

Motivation. Communicate and reinforce the student after each execution improves the sense of personal self-efficacy and autonomy. This strategy is valid for both nell'alunno disabled as for the able-bodied student. On the next page are some tables summarizing some suggestions for adapting physical activities for children with special needs.

Table 1. Variables to adapt the games and sports to promote the inclusion of pupils with special needs.

Possible variables to adapt games and sports					
Participants	Equipment	Play area	Rules	Role players	Other Players
Knowing the abilities Learn about their experiences. Knowing the appropriate activities for their age. Knowing which activities are most welcome and those who dislike the most of the students (mental, visual, auditory and motor). Learn about their experiences. Knowing the appropriate activities for their age. Knowing which activities are most welcome and those who dislike the most.	Make the object of the game bigger or smaller. Make it softer and softer. Audible or visible. Change the structure of the object. Make it lighter or heavier. Increase the size of the target.	Enlarge or shrink the field of play. Visibly mark the boundaries of the playing area (for example, ropes, cones or mattresses). Steer individuals toward thereof game. Lower the height of the targets....	Changing the rules of the game, eg. a child with disabilities is not limited in time to hold the ball. Changing the goal of the game, eg. from competitive to cooperative. Increase tactical tasks, eg. play by holding hands 2 to 2. Assign a guide or aid of a teammate. Increase opportunities, eg have more chance to beat or longer before the opposing team starts to defend. Shortens the game or add more recovery time.	Changing role of players such as reverse attackers and defenders. Restrict or add responsibilities, such as only break or just run. Define the tasks for the players to one or two. Reduce competitiveness.	Simulating disability. Learning to turn to offer help. Try to develop adaptation strategies. Try it in turns to make the captain or the leader.

Table 2. Examples of adaptation of games to the network.

Rules	Equipment	Environment	 Instructions
Allow two bounces in tennis or volleyball, allowing the ball to bounce, allowing more than one attempt to joke, to allow a player to receive, to walk with the ball and shoot.	Using an inflatable ball, like a beach ball, which has trajectories more slowly, use a sponge ball.	Mark in a more visible the playing field, for example with larger lines or cones, decrease the stimulation (eg noise), create a rest area, use a field shorter and wider.	Involved in the game the teacher, engage classmates that can help to provide assistance, use different teaching strategies, seek to provide individual instruction when possible.

4. Conclusions.

Experience your body in a conscious, personal, critical, creative and satisfying, to know and control their emotions and drive, to connect with people and the environment, transfer skills and being open to new knowledge are vital components in ' balance of the subject in its cognitive dimension, relational, communicative, expressive and operational.

In schools, education, mobility, and then adapted physical activity, is the most appropriate teaching strategy, as it enables the pupil with a disability to participate actively and directly to their growth process motor, psychological, intellectual and social

Indeed, through sport all persons with disabilities can achieve not only physically but also mentally and cognitively. The line strength lies in the belief that these people can live their lives fully, if you receive them appropriate support. For this to happen it is necessary that all sectors of society, and first school, work together to find appropriate support strategies, capable of promoting inclusion and integration of disabled people.

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ORIGINAL RESEARCH

EFFECT OF KAPALBHATI ON BODY FAT PERCENTAGE AND WATER CONTENT AMONG UNIVERSITY YOGINIS

SATPAL Yadav, M.Phil¹, Dr. A. S. SAJWAN, Ph.D.² Dr. BALJINDER Singh Bal³¹Department Physical Education, Lovely Professional University, Phagwara, Punjab (INDIA)²Lakshmibai National University of Physical Education, Gwalior, Madhya Pradesh (INDIA)³Guru Nanak Dev University, Amritsar Punjab, INDIA**Abstract:**

The present study aimed at assessing the effect of Kapalbhati on body fat percentage and water content among University Yoginis. The subjects for the study were selected on the basis of random group design. Thirty (N=30) female students were selected as subject for the present study from Lakshmibai National University of Physical Education (Deemed University), Gwalior (Madhya Pradesh) INDIA. The entire subject ranged between the chronological age of 17 to 22 years. Experiment treatment was then assigned to group “A” while group “B” acts as control. Body composition analyzer was used to measure the Body Fat Percentage and Body Water content. The subjects underwent training for 12-week with the Kapalbhati. The difference in the mean of each group for selected variables was tested for the significance of difference by paired ‘t’ test. The level of significance was set at 0.05. The result has shown the significant effect in body fat percentage since cal. $t (=3.742) > \text{tab } t. 05(14) (=2.145)$. The treatment of twelve week Kapalbhati training programme also shown significant improvement in case of body water content, since cal. $t (=6.722) > \text{tab } t. 05(14) (2.145)$.

Keywords: Kapalbhati, Body Fat, Body Water Content.**INTRODUCTION**

In recent years there has been considerable interest in scientific research on yoga in India and in the west. Today yoga being a subject of varied interest, has gained worlds wide popularity. [1] Yoga has both preventive and therapeutic benefits. The process of Kapalbhati is related to the breathing process; however it is not a type of pranayam. But, certain sadhakas think in this manner and study Kapalbhati under the impression that they are studying a type of pranayam. However, process of cleaning the wind pipe is one of the shuddhikriya. [2] The nature of every yogic practice is Psycho Physiological and if this conceptual background is not clearly understood, the whole outlook on yogic practices will be disturbed. The relation of yogic practice in terms of anatomy and physiology would remove many misconceptions about them. [3] The word Kapalbhati is made up of two words, kapal meaning skull (skull includes all the organs under the skull too) and bhati means shining, illuminating. Body composition refers to the relative amounts of the different compounds in the body. Typically, researchers have focused on the proportion of the body mass that is water, protein, mineral and fat. The assessment of body composition is generally performed in order to determine and monitor one's health and fitness status, and to aid in planning training programs for athletes. [4] In this article, the effect of Kapalbhati on Body Fat Percentage and Body Water Content will be presented and discussed.

METHODS

SUBJECTS

The subjects for the present were selected on the basis of random group design. Thirty (N=30) male students were selected as subject for the present study from Lakshmibai National University of Physical Education (Deemed University) Gwalior, INDIA. All subjects ranged between the chronological age of 17-22 years. The selected subjects were further divided into two groups. Experimental treatment was then assigned to group “A” and group “B” acts as control. The subjects were subjected to a twelve week Kapalbhathi training programme.

SELECTION OF VARIABLES

To find out the effect of Kapalbhathi among students of Lakshmibai National Institute of Physical Education, the following variables were selected for the study.

1. Body Fat Percentage
2. Body Water Content

TEST ADMINISTRATION

BODY FAT PERCENTAGE

Body Fat Percentage was measure by body composition analyzer. The subject was made to step on the scale and weight was taken. It gives the most accurate reading first time in the morning, on an empty stomach. Wear no shoes and minimal clothing, if any at all. Write down the weight. The body-fat analyzer has two galvanized handles to hold, a painless current of electricity is sent to upper body to measure the amount of subcutaneous fluid underneath skin. This is the body fat. To find out the body-fat percentage, input all of the information requested on the digital screen of the analyzer. Press the galvanized handles firmly, hit the "Start" button, extend your arms out straight and wait 7 seconds. Now write down your body-fat percentage. Use a calculator to multiply your weight by your body-fat percentage. For example, if you weigh 180 lbs. and you have 10 percent body fat, your body-fat mass is 18 lbs.

BODY WATER CONTENT

Body Water Content was measure by body composition analyzer, flowing afterglow mass spectrometry FA-MS measurement of water abundance in breath samples from individuals. A known dose of deuterated water (Heavy water, D₂O) is ingested and allowed to equilibrate within the body water. The FA-MS instrument then measures the deuterium-to-hydrogen (D: H) ratio in the exhaled breath water vapour. The total body water is then accurately measured from the increase in breath deuterium content in relation to the volume of D₂O ingested.

SAMPLE PRINTOUT OF BODY COMPOSITION VARIABLES

10/SEP/2002 16:58		
BODY TYPE		
GENDER		
MALE		
AGE		
22		
HEIGHT		
176 cm		
WEIGHT		
80.3kg		
BMI		
25.9		
BMR		
8138 kJ		
1945 kcal		
FAT%		
18.7%		
FAT MASS		
15.0kg		
FFM		
65.3kg		
TBW		
47.8kg		
DESIRABLE RANGE		
FAT%		
8-20%		
FAT MASS		
5.7-16.3kg		
BMR: Basal Metabolic Rate	→	
TBW: Total Body Water	→	
		FAT MASS: Total weight of fat in the body
		←
		FFM: Fat Free Mass, ie muscle, bone, tissue, water
		←

TWELVE WEEK OF KAPALBHATHI TRAINING PROGRAMME

In the present study the following five stages were made part of the Kapalbhathi technique:

STAGE-1

Find a comfortable seated position. Gently exhale all the air from lungs then inhale a little. Exhale rapidly like a gentle sneeze a sound with the mouth closed. Then inhale rapidly and begin to exhale and inhale in quick rhythm

STAGE-2

Inhale and exhale rapidly through both nostrils partially blocked. Control the air flow so that it enters through the nostrils.

STAGE-3

Inhale and exhale through the right nostril with the left nostril fully blocked. Breathe in and out of the same nostril. Switch after at least 5 breaths. So this time inhalations and exhalations are done through the left nostril.

STAGE-4

Inhale through the right nostril and exhale through the left.

STAGE-5

Inhale through both nostrils and exhale through the left then inhale through both nostrils and exhale through the right.

KAPALBHATI**FINDINGS AND RESULTS**

The study was conducted to find out the effects of Kapalbhati on body fat percentage and water content. The statistical analysis of data collected on thirty (N=30) subjects. For the chosen variable, the results pertaining to significant difference, if any, between experimental and control groups were assessed by “t” test and are presented in following tables:

TABLE-1
BODY FAT PERCENTAGE OF EXPERIMENTAL GROUP

	Pre-Test	Post-Test
Sample size	15	15
Arithmetic mean	22.0333	23.6800
95% CI for the mean	20.7377 to 23.3290	22.5481 to 24.8119
Variance	5.4738	4.1774
Standard deviation	2.3396	2.0439
Standard error of the mean	0.6041	0.5277

Paired samples t-test

Mean difference	1.6467
Standard deviation	1.7041
95% CI	0.7029 to 2.5904
Test statistic t	3.742
Degrees of Freedom (DF)	14
Two-tailed probability	P = 0.0022

TABLE-2
BODY FAT PERCENTAGE OF CONTROL
GROUP

	Pre-Test	Post-Test
Sample size	15	15
Arithmetic mean	10.2467	10.3267
95% CI for the mean	8.8941 to 11.5992	9.0295 to 11.6238
Variance	5.9655	5.4864
Standard deviation	2.4424	2.3423
Standard error of the mean	0.6306	0.6048

Paired samples t-test

Mean difference	0.08000
Standard deviation	0.6732
95% CI	-0.2928 to 0.4528
Test statistic t	0.460
Degrees of Freedom (DF)	14
Two-tailed probability	P = 0.6524

TABLE-3
MEAN, STANDARD DEVIATION (SD), STANDARD ERROR OF MEAN (SEM) OF BODY FAT
PERCENTAGE OF EXPERIMENTAL
AND CONTROL GROUP

Group	Number	Mean	S.D.	SEM	't' Value
Experimental (Pre-test)	15	22.0333	2.3396	0.6041	3.742
Experimental (Post-test)	15	23.6800	2.0439	0.5277	0.460
Control (Pre-test)	15	10.2467	2.4424	0.6306	
Control (Post-test)	15	10.3267	2.3423	0.6048	

**Significant at 0.05 level of confidence.*

"t".05 (14) = 2.145

Table-3 shows that the mean of body fat percentage of pre-test of experimental group and post-test of experimental group was 22.0333 and 23.6800 respectively, whereas the mean of body fat percentage of pre-test of control and post-test of control group was 10.2467 and 10.3267. The "t" value in case of experimental group was 3.742 and for control group it was 0.460. Since cal. $t (=3.742) > \text{tab } t_{.05 (14)} (=2.145)$, H_0 (null hypothesis) is rejected at .05 level of significance. Thus it may be concluded that twelve week training program of Kapalbhathi on university yoginis showed significant effect in body fat percentage. As per the study the above remark can be given at 95% confidence. The graphical representation of responses has been exhibited in figure-1.

FIGURE-1
P-VALUE, TWO TAILED AND ONE TAILED PROBABILITY VALUES OF
A T-TEST OF EXPERIMENTAL GROUP OF
BODY FAT PERCENTAGE

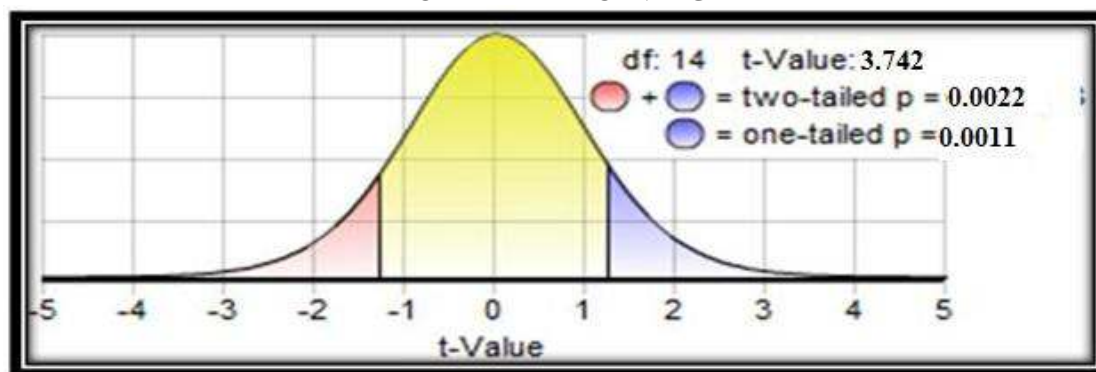


FIGURE-2
P-VALUE, TWO TAILED AND ONE TAILED PROBABILITY VALUES OF
A T-TEST OF CONTROL GROUP OF
BODY FAT PERCENTAGE

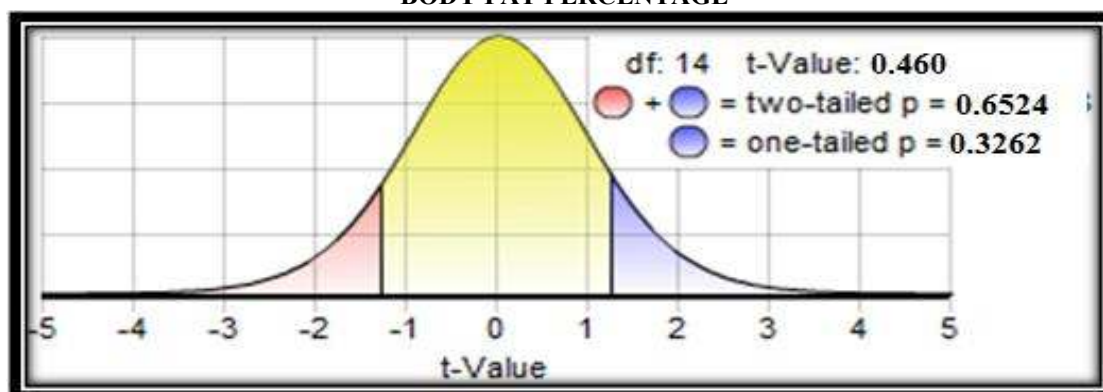


TABLE-4
WATER CONTENT OF EXPERIMENTAL
GROUP

	Pre-Test	Post-Test
Sample size	15	15
Arithmetic mean	53.8400	54.5933
95% CI for the mean	52.4805 to 55.1995	53.2374 to 55.9492
Variance	6.0269	5.9950
Standard deviation	2.4550	2.4485
Standard error of the mean	0.6339	0.6322

Paired samples t-test

Mean difference	0.7533
Standard deviation	0.4340
95% CI	0.5130 to 0.9937
Test statistic t	6.722
Degrees of Freedom (DF)	14
Two-tailed probability	P < 0.0001

TABLE-5
WATER CONTENT OF CONTROL
GROUP

	Pre-Test	Post-Test
Sample size	15	15
Arithmetic mean	56.3067	56.5533
95% CI for the mean	55.2592 to 57.3541	55.1276 to 57.9791
Variance	3.5778	6.6284
Standard deviation	1.8915	2.5746
Standard error of the mean	0.4884	0.6647

Paired samples t-test

Mean difference	0.2467
Standard deviation	1.9420
95% CI	-0.8288 to 1.3221
Test statistic t	0.492
Degrees of Freedom (DF)	14
Two-tailed probability	P = 0.6304

TABLE-6
MEAN, STANDARD DEVIATION (SD), STANDARD ERROR OF MEAN (SEM) OF BODY WATER
CONTENT OF EXPERIMENTAL
AND CONTROL GROUP

Group	Number	Mean	S.D.	SEM	't' Value
Experimental (Pre-test)	15	53.8400	2.4550	0.6339	6.722
Experimental (Post-test)	15	54.5933	2.4485	0.1330	0.492
Control (Pre-test)	15	56.3067	1.8915	0.4884	
Control (Post-test)	15	56.5533	2.5746	0.6322	

*Significant at 0.05 level of confidence.

"t" .05 (14) = 2.145

Table-3 shows that the mean of water content of pre-test of experimental group and post-test of experimental group was 53.8400 and 54.5933 respectively, whereas the mean of water content of pre-test of control and post-test of control group was 56.3067 and 56.5533. The "t" value in case of experimental group was 6.722 and for control group it was 0.492. Since cal. $t (=6.722) > \text{tab } t .05 (14) (=2.145)$, H_0 (null hypothesis) is rejected at .05 level of significance. Thus it may be concluded that twelve week training program of Kapalbhathi of University yoginis showed significant improvement in water content. As per the study the above remark can be given at 95% confidence. The graphical representation of responses has been exhibited in figure-2.

FIGURE-3
P-VALUE, TWO TAILED AND ONE TAILED PROBABILITY VALUES OF
A T-TEST OF EXPERIMENTAL GROUP
OF WATER CONTENT

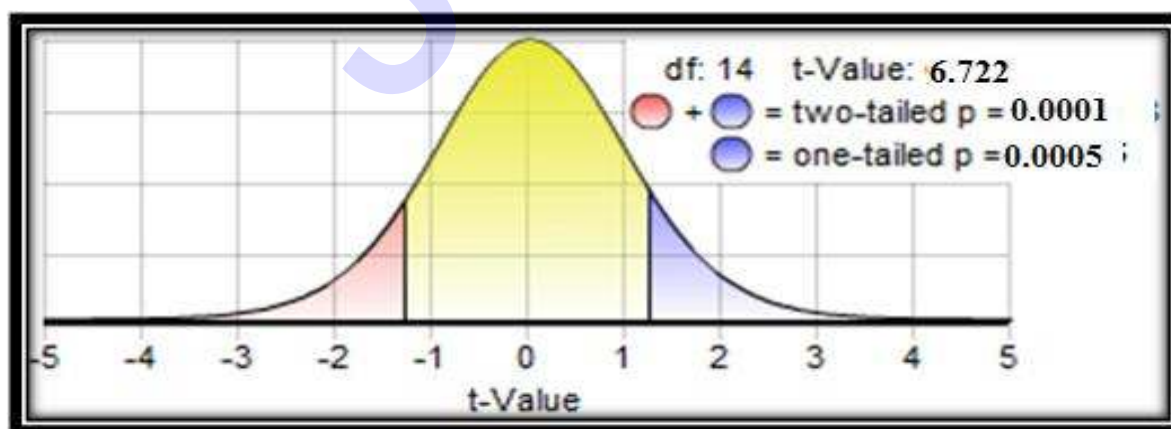
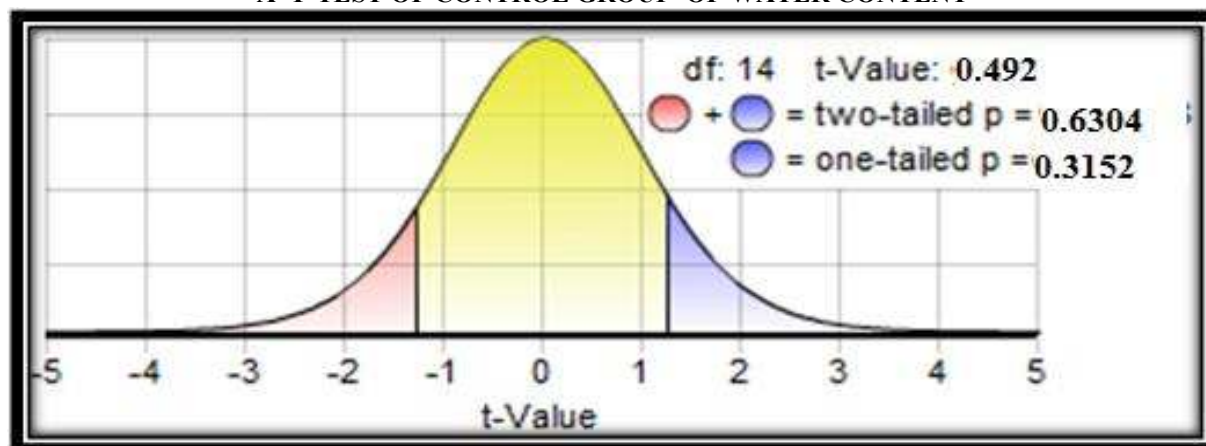


FIGURE-4
P-VALUE, TWO TAILED AND ONE TAILED PROBABILITY VALUES OF
A T-TEST OF CONTROL GROUP OF WATER CONTENT



STATISTICAL PROCEDURE USED

The random group design was used for the study. Two groups were made of the subjects each comprising of 15 subjects. The difference in the mean of each group for selected variable was tested for the significance of difference by “t” test. The level of significance was set at 0.05.

Hypothesis:

$$H_0: \mu_y = \mu_x$$

$$H_1: \mu_y \geq \mu_x$$

Level of significance: 0.05

Inference:

Since calculated “t” is greater than tab t.05, H_0 (null hypothesis) may be rejected at 0.05 level of significance. Thus it may be concluded that twelve week training program of selected Kapalbhathi on University yoginis leads to significant effect in body fat percentage and water body content. As per the study the above remark can be given at 95% confidence.

DISCUSSION

From the results it is evident that the twelve week Kapalbhathi training programme had shown a significant improvement in body fat percentage and body water content. The findings are supported by the study conducted by Udupa K.N. on “Yogic and Non Yogic exercise: Improved Physiological variables of students” to determine the effects of yogic exercise on Physiological variables showed a statistically significant ($P < .001$) improvement. [5]

CONCLUSIONS

Findings of this exploratory study suggest that the treatment of twelve week Kapalbhathi training programme showed significant effect on body fat percentage and body water content.

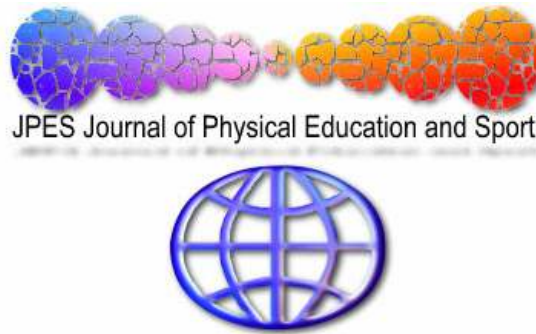
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ORIGINAL RESEARCH

SPORT AS MEANS OF SOCIAL INTEGRATION FOR LESS FAVORED ETHNIC GROUPS

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Abstract: Integration of individuals in society depends largely on their compatibility, the way they are satisfied or not by their work and involvement, leading to the achievement of individual ideals. Mass or performance sport is one of the most important ways that positively influence behavior integration necessary to solve environmental situations, thereby the part becoming a functional element of the system.

Keywords: *integration, sport, Roms*

Introduction: Contemporary society requires its members certain standards of conduct to be observed, which generates an optimal cooperation between them. This collaboration can be achieved on long or short term, depending on the compatibility of their individual needs and climate necessary to achieve it, knowing that a society cannot be effective unless it is compatible with its members.

Individuals who want integration have certain personal needs, and their penetration into society is accepted only if they believe it satisfies their personal needs. The balance between individual and societal needs must be also achieved through the values shared by the two, becoming part of the grade in which they are satisfied with their work, involvement in society and, consequently, a limiting factor of their desire to leave the company. Individual social identity construction in democratic societies is done with rapid integration capability and defining in the entire range of economic, social, cultural and sport activities of a nation.

Starting from these dimensions (community, cultural, ethical, emotional, etc.) sport today is characterized by wide support of different population groups, which allows the construction of numerous original and specific identities through social phenomenon that occurs every day in all democratic societies.

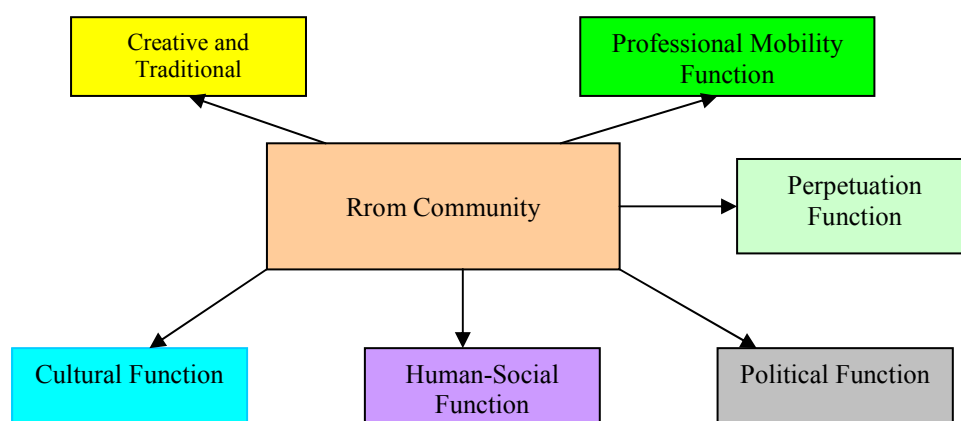
Content: The gypsy ethnic group is an important social segment for our country to be integrated into society through various forms of activities. Difficulty in integrating the Roms into civil society must take into account that not all participants have the same way to engage in the general activity of the community.

In this context, we consider that, one of the most important tasks of Roms social integration is sport activity in all its manifestations. Sport should be a form of educational, cultural and social community activity that positively affects specific behaviors and exceeds traditional habits, thereby sport becoming an integrative consumer product.

Modern society, as well as technical and economic progress achieved in recent years, leads to a constantly and continuing evolving of social values of freedom, creativity, individualism and consumer behavior which leads in its turn to leisure practice and even performance that is more important to identify the perennial values of the whole society.

Mass sports activity or performance can be a certain way to integrate Roms in contemporary society, to eliminate the effect of social exclusion caused by outdated stereotypes and prejudices.

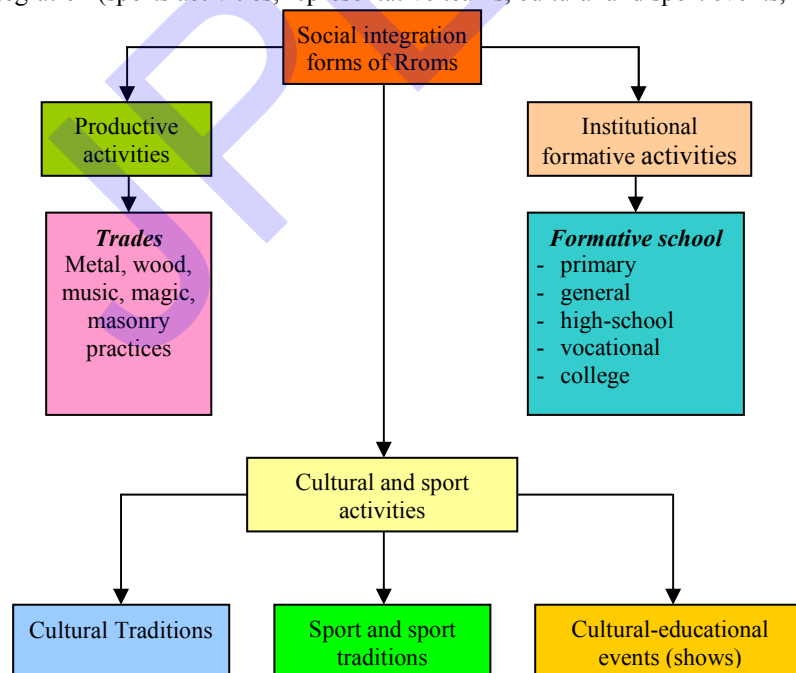
The functions performed by members of Rrom ethnic group are fully consistent with those of contemporary society, even if they customize by specific national, ethnic, religious or linguistic characteristics.



Due to these functions, the Rrom community must be found in practically all compartments (segments) of modern society. But this occurs with shy steps, liberalized access to participation in the process to obtain civic rights on democratic development of modern society and with it human social integration of Rroms is often hindered by prejudices, habits, or even. Seen from this perspective, global integration of Rroms in the Romanian society can not be assessed without specific educational content, without reliable procedures, clearly structured skills, sustainable goals, to ensure quality of activities and educational programs of integration.

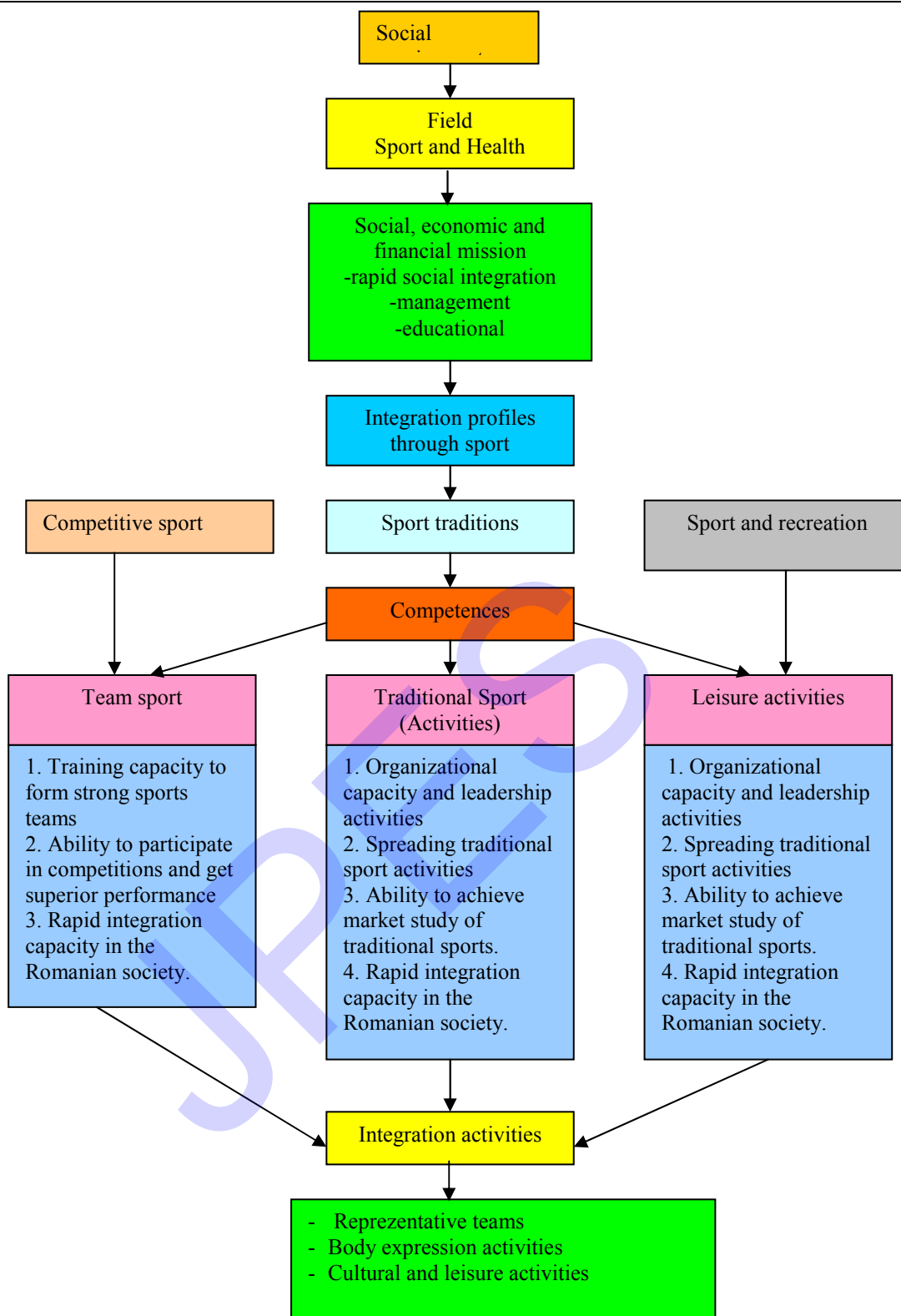
Integration of Rrom ethnicity should be done in full accordance with the objectives of their professional competence:

1. Organizing professional training directions on common categories (vocational).
2. Cooperation and common development of preoccupations regarding continual training of professions on the basis of accumulated knowledge in the educational process.
3. Ensuring good institutional cooperation with (through) the Rrom community by installing mechanisms to ensure quality of life on the principles of ethics, equity and contribution to achieving the national gross product of Romanian economy.
4. Organizing training courses for various professional activities required in the labor market and with it the rapid integration without loss of material goods in productive activity.
5. Ensuring optimal coverage extra productive activities for the Romanian society so that it may create appropriate forms of integration (sports activities, representative teams, cultural and sport events, etc.).



Evaluating these forms of integration will be based on acceptance and interest of the Romanian society to include them in general concerns regarding the development of modern society.

Here is the paradigm of integrating the Rrom ethnicity in contemporary society through sport.



Conclusions:

1. A new strategy to integrate Roms in Romania through sport, meets new requirements of social development of the concept regarding the role of physical education and sport in the lives of different classes of citizens.
2. This integration (of Roms) through sport is dynamic and flexible, while allowing Roms and other citizens to adapt to any requirements included in the activities of Romanian society.

3. This strategy falls within the concept of autonomy that provides equal opportunities for all categories of citizens, enabling the full human and material potential, irrespective of the nature and structure of Rom ethnicity.
4. The new strategic orientation provides both formative and practical activity in which the Rom ethnic integration through sport in Romanian society represents an example for all categories of Roms worldwide.
5. It is imperative to design approaches to specialized institutions carrying out the integration of less favored ethnic groups (in sports and not only) in contemporary society.

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