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KINETOTHERAPY IN HAEMOPHILIC ARTHROPATHY OF THE KNEE

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Abstract. Haemophilia is a rare, disabling chronic congenital disease, part of the haemorrhagic syndrome category. Its disabling nature is due to specific musculoskeletal complications such as: muscle bleeds, haemarthrosis, synovitis, pseudotumours, osteoporosis, fractures and haemophilic arthropathy. The appearance of haemophilic arthropathy has three stages: haemarthrosis, chronic synovitis and degenerative arthritis. When inflammation and oedema increase, joint degradation is associated with a degradation of the periarticular muscles, and chronic haemophilic arthropathy appears. Haemophilic arthropathy involves significant loss of functional ability requiring the application of appropriate kinetic therapy. The objectives of kinetic treatment are mainly conditioned by the predisposition to bleeding, the stage of haemophilia and the stage of arthropathy. The main goals are the reduction of pain, correction of posture, improvement of articular mobility, restoration of muscle balance and correction of deficient biomechanics. It is important for the physiotherapist to know the unique physiology of the haemophilic patient and make decisions based on an optimal documentation.

Keywords: haemophilic arthropathy, haemorrhagic syndrome, disabling disease, functional recovery.

Introduction

Haemophilia is a rare congenital disease (the number of haemophilic patients in the world is ~ 400,000) characterised by an increased tendency to spontaneously bleeding or triggered by minor traumas.

This condition falls into the category of haemorrhagic syndromes, being determined by a quantitatively reduced or qualitatively altered synthesis of plasma thromboplastin factors.

Depending on the factors involved, there are three forms of haemophilia: A, B and C. The most common coagulopathy is haemophilia A, representing 80% of cases of haemorrhage syndromes (Oltean et al., 2014).

Haemophilia is a disabling disease especially due to associated joint sequelae, which are doubled by the occurrence of muscle and sensory sequelae (deafness, blindness) and also neurological sequelae (epilepsy, hemiplegia). The most common localisations of the haemorrhage are the joints and muscles. Haemophilic arthropathy is a joint disease secondary to haemophilia, which appears following repeated haemarthrosis favoured by pre-existing coagulopathy. It is characterised by degenerative changes at the cartilage level, accompanied by inflammatory reactions at the level of the synovial membrane (Badea, 2018).

The most common localisation is the knee joint, the disorder being almost invariably bilateral.

The onset of haemophilic arthropathy has the following stages: stage 1 – haemarthrosis; stage 2 – chronic synovitis; stage 3 – degenerative arthritis. When inflammation and oedema increase, joint degradation is associated with the degradation of periarticular muscles (muscle hypotrophy evolving towards atrophy), and thus chronic haemophilic arthropathy appears. Angular deformities, the presence of contractions in the periarticular muscles and muscle imbalances are specific to chronic haemophilic arthropathy (Knobe & Berntorp, 2011).

Haemophilic arthropathy is diagnosed on the basis of the clinical and X-ray examinations. Biological confirmation of the diagnosis is performed in specialised laboratories following the examination of coagulation factor VIII deficiency (FVIII-C) and global hypocoagulability (World Federation of Haemophilia, 2012).

Chronic haemophilic arthropathy may appear at any time starting in the second decade of life, being conditioned by the severity of the disease and the adopted treatment.

With the progressive degradation of the articular cartilage caused by repeated intra-articular bleeds, an atypical form of arthritis appears, which is associated with the presence of muscle imbalances, periarticular muscular contractures, atrophy and angular deformation of the joint (Figure 1). This fibrosis leads to ankylosis over time. At that time, the pain decreases considerably or completely disappears, but the functionality is compromised (Lobet, Hermans, & Lambert, 2014).
Fibrous ankylosis or bony ankylosis may be present (Bruckner et al., 2013).

In chronic haemophilic arthropathy, the skeletal radiographic examination presents: the joint space narrowing, irregularly-contoured joint surfaces, bone geodes, subchondral bone cysts, osteoporosis, and such degradation may lead to total destruction of the joint. Regarding the radiographic examination for haemophilic arthropathy located in the knee joint, a number of specific signs are noted, such as: increased joint volume, deformation of the epiphysis that may lead to bone fusion, deformation of the patella (which develops a rectangular shape) and development of the diameter and depth of intercondylar fossa (Figure 2).

The main priorities of the treatment being the prevention of joint trauma, the prompt treatment of acute bleeding and the optimal management of specific complications are required.

Particular attention should also be paid to psychosocial health.

Drug therapy aims to compensate for the coagulation factor deficiency and is constantly administered both in acute bleeding and outside of it, representing a prophylactic method for the preservation of musculoskeletal function and the prevention of haemophilic arthropathy.

If conservative measures do not manage to relieve pain and conserve or restore the joint functionality, the surgical intervention is considered.

Topic addressed

The first approach of the physiotherapist is the morphofunctional evaluation of the knee, a stage necessary for establishing the appropriate goals and methods.

During the functional examination, articular mobility will be tested to quantify the deficiency, and the muscular imbalance will be verified by examining the tone of antagonist muscle groups (the hamstring, tensor fasciae latae and gastrocnemius muscles often become hypertonic, while the quadriceps often has a low tone that may degenerate into muscle atrophy).
Functional examination can also include additional tests, such as passive testing of the collateral and cruciate ligaments, because ligamentous laxity may appear secondary to haemorrhage, including in the absence of direct trauma.

Kinetic treatment should be initiated as early as possible, and the objectives pursued must be specific, measurable and realistic and must respect the basic principles of kinetotherapy.

In haemophilic arthropathy, the primary goal is to relieve pain. Once this goal has been achieved, it is intended to restore muscle balance, correct posture and deficient biomechanics, increase joint mobility, improve stability, balance and coordination. The methods used in this respect are:

Specific kinetotherapeutic methods

1. Axial traction. The manual axial traction is mainly used because it allows optimal dosing and is applied periodically using progressively increasing traction forces.

   Increased caution is necessary when working with a haemophilic patient. The main purpose of using traction in haemophilic arthropathy is to relieve pain.

2. Postural correction. The joint deformities associated with haemophilic knee arthropathy are the knee varus, valgus or flexum, and the posture correction, as a therapeutic method, seeks to adjust them.

   It is also possible to use postures that can lengthen the hypertonic muscles to increase the elasticity of the tissue and thus adjust the abnormal muscle tone.

   The corrective postures are applied respecting the principle of progressivity, firstly using the manual posture followed by the self-corrective and the instrumental ones.

3. Dynamic kinetic techniques. All forms of movement can be used: passive, active assisted, active free or resistive, static or dynamic.

   At the beginning of kinetic therapy, the programme targets the use of minimal load and reduced effort, and the working regime is by isolated muscle activation in non-painful positions.

   Continuous passive movements can be used through Kinetec (Figure 3) to enable increased control over movement parameters: direction, range of motion and execution speed, thus allowing optimal dosing and effective progress monitoring.

   Dynamic kinetic techniques can also be applied in the form of mechanotherapy: pulley therapy (exercises performed using weight systems, clamping systems, a chord and 1, 2 or 3 pulleys) (Figure 4) or spring therapy – exercises performed using elastic bands.

4. Neuromuscular and proprioceptive facilitation techniques. Special techniques of general nature or techniques designed to improve the joint stability or mobility can be used.

5. Stretching. The technique aims to improve the elasticity of the soft periarticular tissues, muscles and connective tissues. In haemophilic knee arthropathy, stretching is used especially for achieving proper elasticity of the knee flexor muscles and regaining articular mobility in order to correct specific vicious postures.

Figure 3. Passive movements using Kinetec

The target structures are slowly put into tension, and the duration of the technique will be reduced. Dosage is done in such a way that the application of the technique does not produce pain. Both dynamic and static (passive) stretching can be used.
6. Myofascial and myotensive techniques. They mobilise soft tissues and are used for reducing mobility restrictions and lowering muscle tension. The effects of applying them consist in reducing pain and muscle contractures and improving joint mobility by increasing tissue elasticity.

7. Occupational therapy. It consists in practicing a basic productive activity, playful and bodily activities, recreational or leisure activities adapted to the functional deficit of the haemophilic patient.

Non-specific kinetotherapeutic methods

1. Electrotherapy. The most commonly used forms of electrotherapy are: diathermy using pulsating shortwaves and ultrasound therapy.

The pulsating shortwave diathermy can be applied with increased efficacy to haemophilic patients, being a form of treatment that does not involve the increase of intra-articular temperature. It is mainly used in the management of acute haemorrhage in order to reduce oedema and stimulate early regeneration. This therapy has the following effects: accelerates tissue regeneration, increases the number of lymphocytes and fibroblasts in the target area, increases storage of collagen and fibrin fibers, increases reabsorption of oedema and haematoma and reduces local inflammatory process.

Ultrasound is mainly used in subacute and chronic stages to reduce healing time and support qualitative tissue recovery. Ultrasound can be used in the treatment of haemophilic arthropathy due to the fact that the heating effect is directly proportional to the rate of energy absorption rather than to the total value of the applied energy. As a result of heat dissipation, the treatment produces an insignificant increase in local temperature.

The effects of non-thermal application are: increased efficiency of metabolite transport, increased membrane permeability and stimulation of cellular activity. It also has the effect of a deep tissue micro-massage that contributes to reducing local oedema. Stimulation of local circulation and cellular activity supports the reduction of oedema and, during the remodelling and recovery stage, ultrasound has the effect of increasing the resistance and elasticity of the scar tissue.

2. Thermotherapy. Warm applications are contraindicated, while cryotherapy is mainly used in acute haemorrhages, but can also be used in subacute and chronic stages. Cryotherapy is applied for decreasing painful sensitivity and obtaining localised vasoconstriction. For this reason, applications should not exceed 3-4 minutes to avoid the appearance of the reflex vasodilatation associated with intense active hyperaemia.

Complex methods

Hydrokinetotherapy. The main goals of physical exercise performed under water are: reducing muscle pain and spasms, increasing joint mobility, increasing muscle strength, correcting muscle imbalances, improving coordination, restoring functional abilities and providing general relaxation. In this regard, breathing exercises, knee joint mobilisations that can be performed passively, actively or actively-assisted, stretching techniques, neuromuscular and proprioceptive facilitation techniques and walking exercises can be successfully applied; all of these take place in immersion.

Therapeutic swimming can be also used.

Conclusions

Haemophilic arthropathy of the knee is a joint disease secondary to haemophilia, which involves significant loss of functional capacity, having a strong disabling character.
Kinetic treatment should be initiated as early as possible and the objectives pursued must be specific, measurable and realistic.

It is also important to consider the patient’s bleeding predisposition, the haemophilia stage and the arthropathy stage.

The first approach of the physiotherapist is the morphofunctional evaluation of the knee, including joint testing, muscle testing and additional tests, such as passive testing of the collateral and cruciate ligaments.

The specific objectives are pain relief, restoring muscle balance, correcting the abnormal posture and deficient biomechanics, increasing joint mobility, improving joint stability, balance and coordination. Functional recovery in haemophilic knee arthropathy is based on kinetotherapy-specific means (postural correction, dynamic kinetic techniques, neuromuscular and proprioceptive facilitation techniques, axial traction, stretching), as well as non-specific means (electrotherapy, thermotherapy) and complex means (hydrokinetotherapy).

Authors’ contributions

All authors contributed equally to this study and should be considered as main authors.

References


HIGH-LEVEL SPORT AND THE SPIRIT OF THE TIMES

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Abstract. The spirit of the times finds in sport a favourable environment to manifest itself, as long as performance remains the ideal pursued. The Zeitgeist is a phenomenon that creatively exploits the skill-related theoretical, factual and experiential potential of general intellects in different fields: art, economy, industry etc. Improvisation is its form of manifestation. From sport, the performance mentality has migrated to social activity areas so that our today’s society is entirely performance-driven. General intellects are cognitively and emotionally prepared minds that detect earlier than a population to which they belong what follows and is likely to happen, defining the concerns in the field of sport. They are the precursors who attest and promote novelties that will become currents or generalised trends. Novelty does not spread smoothly, like a halo that embraces the entire population concerned, but also encounters resistance (as any form of change). The preparation of general intellects is the responsibility of universities and involves specific measures promoted by the very spirit of the times.

Keywords: sport, spirit of the times, mentality, trend.

Introduction

The philosophical literature considers that the spirit of the times or the spirit of the age (Zeitgeist - in German) is a concept able to demonstrate that time has meaning and therefore a material content. According to Hegel (1807/1995), it reflects the experience of a dominant cultural climate that is historically determined. Subsequent (but mostly current) research studies and analyses on the precursors of classical philosophy have defined the concept in all its complexity, considering it as a determining factor for the dynamic development of a field. The spirit of the times marks a trend, characterising the following directions: ascension, consolidation and even retro inspiration of some fields of activity, such as fashion, “taste”, intellectual climate, mentalities, cultural currents, policies, sport, art etc., over a given period of time.

The Zeitgeist has a particular importance in performing arts, such as sport, theatre, ballet, dance etc., maintaining a direct and immediate relationship with the audience, who has a group reaction to its production. Improvisation is its form of manifestation.

The skill-related theoretical, factual and experiential potential is an area of knowledge where the spirit of the age originates. Structured in a favourable social climate, it produces “a gestating idea whose symptoms and characteristics are waiting” (Banu, 2018, p. 15). The hypothesis is born out of a prepared mind seeking a solution, a way and the means necessary to the goal-reaching process.

Although, in sport, the spirit of the times appears, in a first phase, as something that is not explicitly established, as possible answers to situational questions (from the environment) or syntheses, as examples of one’s own experiential activity consciously integrated into a new context, it manifests in an original form or as a particular way of seeing what was or is fashionable, as an acknowledged Zeitgeist.

Topic addressed

Origin and genesis of the spirit of the times in sport

The manifestation of the spirit of the times as a spiritual reality starts from a philosophical system created or assimilated as an expression of self-awareness. Olympism is a product of the spirit of the times, which still goes on developing, its essence being the Olympic spirit. Its social halo has expanded, migrating from sport to other areas: culture (Olympism itself is part of culture), politics, art, economy, administration etc. Its revaluation and strengthening as an original projection of some particular values have led to the expansion of a sporting mentality: performance in fields of activity whose goals are synonymous with the ideal of sport, our today’s society becoming entirely performance-driven.

Sport, by its nature and organization in all phases, provides situations for the birth of the spirit of the times, starting with the stage of developing strategies, planning and scheduling over various periods of time (projections) and continuing with preparatory and competitive applications.

The Zeitgeist offers the ability and competence of expressing oneself and the manifest or only potential trends that arise and influence the complex professional and social metabolism of sport. Therefore, we are referring to the
The creation of new technical elements in gymnastics, new techniques in athletics or sports games, as well as the creation of new sports disciplines in which today’s youngsters excel, illustrate the spirit of the age. We note the emergence of new sports (which are not the creation of specialists, but belong to young people passionate about sport) through transformations, innovations in the structure of established disciplines, other technical elements or the use of new materials, equipment or installations, accompanied by regulations necessary for the society to recognise them and implicitly the achieved performance.

The spirit of the times is determined, in the case of sport, by the mad rush for performance, which is a goal, a function and an absolute prerequisite. Sport is indissolubly linked to performance, no matter the level of practice. Actually, this is what determines its existence.

General intellects are prepared minds that detect earlier than a population of specialists (including academics, researchers, activists, physicians, psychologists, biochemists etc.) what follows and is likely to happen, defining the concerns and directions in which a phenomenon will probably evolve.

The spirit of the times in sport is largely determined and described by the cognitive ability or the mind that thinks, but, in reality, it is highlighted only by the “second mind”, the one that feels (Goleman, 2008, p. 35) – emotionality. The rational mind could not act outside the passion for sport and for what is new and useful. The harmonious balance between reason and emotions, feelings and passion is the one that guides us in detecting and developing performance. In the process of knowing the sport genius, the prepared minds regarded performance as an original, polyvalent, biological, psychological and artistic value. Paraphrasing Nietzsche (1992, pp. 11-13), like in dance, sports gestures delight and exalt the man, the joy of movement transforms him; he is no longer an athlete, but turns into an artwork.

Ghiu (2018, p. 16) states: Sport is a form of chiselling the human body. An artistic creation.

Resuming the thread of our narration regarding the prepared minds, some of them also act in malefic directions to capture the movements that occur in society, in general, but especially in sport. We recall the competitions without “gloves” and moral brakes for the discovery of new undetectable substances to artificially increase the performance reserves of athletes. The counteraction has come from specialised international bodies that provided solutions also based on the spirit of the age, using new direct and indirect methods of detecting those substances.

Nowadays, previous certainties and trends are unfavourably influenced in order to produce and manifest the Zeitgeist. The suffocating avalanche of specialised information, post-truth interventions in the social media, increased number of general intellects, global audience of the show-sport (performing art) in an unprecedented demographic growth and rapid generalisation of scientific novelties are elements difficult to be mastered by a single individual however brilliant he or she may be. For these reasons, the call for teamwork of “intellectual workers” is unconditional in order to reach an application model directed to the field of sport.

**Intellectual workers and the spirit of the times in sport**

McKenzie (2018, pp. 13-14), referring to those who, through their work, talk about the state of the world and the development of science (and seek to discover and promote the spirit of the times), redefines the complex notion of general intellects (A/N - author’s note) (different from the concept of Marx), stating that they are “those people employed in universities or similar institutions. They are intellectual workers who think, speak or write and apply their work which is commoditised and then sold”. They are those people who have a particular sensitivity to detect a cognitive-imaginative phenomenon that occurs at a given moment and will then be clearly perceived and presented.

The spirit of the time manifests in those who are parts of the general intellects and try to find methods to think and write intelligently and develop performance. They act in the two types of knowledge about real science: through studies on science (specifically the “sports science”?) and through studies on the social relations of science (Bernal, 1964). This means that modern science emerges, on the one hand, from advanced forms of technical work (see “practice”), which, for some, refers to the role of source of standardised activities that are inevitably routine - A/N - rather than to application, the natural and uninterrupted continuation of a mental, cognitive process), and on the other hand, from the high-culture forms whose products are non-standard. To which class do those who produce these values belong? McKenzie (2018) talks about the hacker class, while Bernal (1964) talks about scientific workers. Under these conditions, production relationships absorb general intellects into the commodity system; the rise of intellectual property, as a mutation of private ownership, restricts access to shared information and creates new categories of “potential goods”.

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metabolic integration of the element into the integron (Paillar, 1994), but also to the natural, technological, social, cultural, economic and other contexts.
The multi-qualified specialist coach, a superior general intellect, has the ability to perceive movements that occur in society, but also what happens inside the Olympic Movement, the global movement in their own sports discipline; all this, together with the coach’s previous certainties, will give rise to an application model for the development, continuation or elimination from performance. This kind of intellectual worker, with a high cognitive and intelligent-emotional profile and aware of digital techniques and not only, provides it with the fecundity of the relation to the spirit of the times. Paraphrasing Banu (2018, p. 15), who refers to art: we consider the capabilities of a coach and his or her team as essential to meeting the expectations formulated at a certain age or stage (see the Romanian society’s expectations related to the revival of sport).

The potential of the spirit of the times to produce performance manifests as a production of knowledge: it does not remain endogenous, but becomes exogenous implicitly by its values, being socially monitored and administered.

The Zeitgeist involves creativity, invention and innovation as a new type of business that changes everything else (naturally!). It is worth mentioning that the technologies (in a broad sense) of performance (less the performance itself, because it is manifest, public) are characterised by discretion in the scientific communication used. They become values of intellectual property, leading to increased competitiveness in an organized and more and more globalised environment. The cooperative extrapolation of different forms of knowledge on the metabolism of performance is achieved in the form of intellectual property exchange.

The spirit of the times as a trend in sport

The Zeitgeist loses its explosive impact as time goes by, “being assimilated and having almost unanimous spreading” (Banu, 2018, p. 15); therefore, it is dispersed as something known and easy to manifest. Sports training relied for a long time on the concept of preparation with high amounts of effort, according to the saying: “Train as much as you can, do running, swimming and other exercises as much as you can”.

The rule of the 10,000 hours of practice that would guarantee success in any field (music, sport etc.) appeared during the same period. In the course of time, the “train wisely” specification also emerged. According to Goleman (2014, pp. 174-175), if an athlete trains for tennis and performs mechanically the same wrong forehand stroke for hundreds or thousands of hours, there will be no benefit.

Wise training cannot work without a feedback cycle that allows recognising and correcting errors. In view of the above, with the emergence of a novelty, this one must be thoroughly assimilated in order to apply it then effectively to the group of athletes, who also need to be simultaneously trained for a deep understanding of the technique or method. The widespread dissemination of what is fashionable also involves the adaptation to those who put it into practice (fashion, in the case of clothing or footwear, takes into account the body of the person who will wear it, a rule that applies to any field when making an attempt to adjust to a trend).

New strategies, methods and techniques become a version of the Zeitgeist and definitely involve positive thinking, which entails a change in the perception of novelties. Barbara Frederikson (cited by Goleman, 2014, pp. 181-182), in her studies about positive feelings and their effects, says that, when we are in a good mood, the focus of our attention shifts from the egocentric “me” to the more tolerant and friendly “we”. The tendency to positivity reflects the activation of the brain’s neural network, whose correspondent is the value of the compensatory system. When we are happy, the nucleus accumbens is activated somewhere in the central brain. These dopamine-rich networks determine motivation and generate good mood feelings and perseverance. Positive thinking combines learning and training with a dose of joy and pleasure to repeat movements, even for the most experienced athletes.

Skilled coaches adopt the trend following experimental, test-based applications and, depending on the results, use it on a regular basis.

Globalisation, Zeitgeist and cosmopolitanism as a trend

The globalisation process has brought about the permeability of boundaries, interdependencies, the expansion of media migration, international education and other forms of culture that have become worldwide trends. In this context, sport has increased its global mobility at the competitive, but also the preparatory and academic levels. As a result of this phenomenon, the spirit of the times and the trend (sometimes the notion of current, which also suggests the dissemination actions, is used), with fast and very wide circulation, facilitate the access of many specialists and athletes to the latest novelties. Circulation without borders also fosters actions that threaten global society, such as pollution and international terrorism. Admitting such developments, Beck (2006, p. 2) raises the question: would cosmopolitanism be an alternative solution?

Interpreting, cosmopolitanism in sport has become the defining feature of a new era, of reflexive modernity, where national boundaries and differences are dissolved and must be negotiated in accordance with the logic of a
“policy of politics”. That is why a world that has become cosmopolitan urgently calls for a new position, that of the cosmopolitan concept based on which we can understand the spirit of the age as a social reality that we live and which acts in sport. The cosmopolitan concept is a presupposition illustrated by the Zeitgeist and also a result of the conceptual reconfiguration, a trend or the reflection of a new perception. Universalism, relativism, ethnicity, nationalism or multiculturalism should not be opposed, in the case of sport and the spirit of the times, but rather integrated into a new synthesis represented by cosmopolitanism.

Acceptance and integration into the spirit of the times

Authors of the spirit of the times promote it prudently as an attempt, a possibility of progress or a proposal of application at different levels and to different groups of athletes. Intellectual workers intervene in the preparation process after a preliminary argument accompanied by an application of the idea put forward. The coach or researcher, as well as the group that has carried out the research, are called “precursors”. They launch the method, the device or the work of the debate that may accompany it. Other specialists who are thoroughly prepared to present the Zeitgeist can also be launchers and run the first applications for the audience concerned.

Those who accept will learn about the technique, equipment or method and then use it according to both the particular conditions of sports disciplines and the athletes’ level of training and gender, thus becoming successors. In sport, new ideas, theories, methods, materials and equipment quickly contaminate the field and become fashionable. The athletes’ contribution, through the originality (customisation) of applications in various situations, is essential for accepting the concepts applied. Thus, the spirit of the age is encompassed in the scientific background of the sports training process. (Models and extravagance in sport will be analysed in an article to be published later.)

It is worth making a distinction related to duration, the speed of acceptance and application. In contrast to launchers, successors are among the first to notice the innovative importance of certain changes induced by the spirit of the times. They are distinguished from another subordinate category, that of imitators, ordinary epigones who “jump on the bandwagon” late, adhering to the main stream only after a long time. Imitation is nothing but the mediocre avatar of fashion and attests the desire to join the spirit of the age that has lost any innovative effect (Banu, 2018, p. 15).

Thus, the Zeitgeist becomes fashionable and fails as an imitation, a commonplace.

The spirit of the times and resistance to change

Arts criticism promotes the taxonomy of the forms of receiving and interpreting the spirit of the times by professionals, forms that are also fully applicable to the field of sport.

The first category includes those who are indifferent to inventions, innovations or trends. Specialists, coaches and physical therapists successfully apply the fundamentals of the sports training and organisation or the pattern they have perfectly acquired. Applications produce the expected results if they have been adapted to both the defining coordinates of the group of athletes and the context in which activities are performed. There are people who act with dignity in their professions, in the name of scientifically accredited principles. In the course of their activities, these professionals will find out about what was once new and apply the inventions and innovations if they are appropriate to situations. Being honourably faithful to established traditions and values provides confidence and also activates a form of comfort, but any change involves effort.

The second category includes those who aprioristically reject any concept, form of training or means different from the one they have learned during their university studies or acquired throughout their post-graduate experience. They are prisoners of the spirit of the times from their training periods that have been lived and adopted and which, when facing a novelty, become reference criteria. These rejection situations usually associate with a low level of knowledge, suggesting the phrase: “It works, so I do not care”. These people remain equal to themselves.

The third category includes well-trained professionals who are open to the spirit of the times and eager to perform, trying new methods, state-of-the-art devices, equipment and materials that increase activity efficiency. Intellectual workers in universities, valuable researchers and coaches are those who make up this group of specialists. Banu (2015, p. 15) believes that “perceiving the spirit of the times requires a certain openness to what is happening right now”, requires something that largely involves the ability and art of interfering with the standpoint of another. These are symptoms of the young age, the privilege of those with a sense of modernity. It is a positive attitude as long as accepting and adopting the new is not done hastily, superficially, but is the result of an analysis based on rationality. The spirit of the age can be interpreted as a positive form of “professional deviance”. From our own experience, we state that it is not necessarily only a relationship of young people with
the spirit of the times, since we have met famous coaches who were no longer in their early youth, but showed total openness to the new, promptly experimenting and usually applying recent forms of innovation and inventions.

Motivation and change of attitude towards the spirit of the times

Accepting the spirit of the times, both in its genesis phase and after, is conditioned by motives. The definition given by Allport (1991, p. 202) seems to be the most appropriate: “By motive, we mean any internal condition in the person that induces thought or action”.

The intellectual worker’s behaviour is characterised by a natural tendency to explore the internal and external environments, particularly the professional one, in the natural adaptation process. Exploration is continuous and refers to what we call “lifelong learning”. It involves the way of learning, unlearning and relearning skills and behaviours, Allport (1991, p. 218) and other psychologists considering that “aesthetic” and “motor activity” impulses are differently motivated as compared to the “stress reduction” motivation in children.

In adulthood, when professional consecration occurs, the concept of competence arises as a result of exploiting the gained abilities and personal interests towards self-achievement and the clarification of one’s psychosocial status. Adapting to the professional environment means solving problems that are numerous, new, predictable and unpredictable. In the field of sports performance (Dragnea, 2006, p. 112), the complexity of the adaptive process has widened the sphere of motivation interpretation. According to Wallas (1914), an “instinct of thought” should also be included among the man’s motives, the author adding that people have “the right and freedom to think”.

Problem solving involves reason and, after finding solutions, it changes the person’s attitude and gives rise to a tendency towards acting for something or against something. Attitude has meaning only in relation to certain values (performance, Zeitgeist, fair-play etc. - A/N) (Chircev, 1941).

In the preparation of intellectual workers, building mental images favourable to learning, development and a different way of thinking involves a mediating mental attitude: exploration of the new concomitantly with the tested variants (Goleman, 2014, p. 227).

The intellectual worker’s status should be directed towards meritocracy. For instance, in addition to analysing a training microcycle applied at a certain stage, it is advisable to develop other variants of plans for the same situation, which would lead to similar or different results, preferably superior ones.

Exploitation of the known leads to the learning by imitation and success, while exploration leads to a new path and a greater, resounding success. Any form of plan - schedule for performance enhancement is developed based on one or more ideas, is a projection that illustrates a hypothesis. Actually, it is a variant of the spirit of the age that will be externalised by application. According to Goleman (2014), the first step to a new territory involves giving up the comfortable routine and fighting the inertia of habit; this minor act of attention requires what neuroscience calls “cognitive effort”.

Building a favourable attitude towards the phenomenon that is the object of the new involves a few steps to follow or some variables: attention (focus), understanding, acceptance, memorisation and action (The Hovland-Janis-Kelley Model, cited by Chelcea, 2008, p. 314).

Messages sent by the source should be attractive and interesting. Attractiveness is equally emotional and cognitive. Beauty (admiration, pleasure), similarity and familiarity (recognising a situation) lead to sympathy and capturing attention. Application leads to satisfaction, joy, which Ghieu (2018, p. 16) terms “happiness”.

Message reception, in addition to the “sympathy” regarding the problem-subject and the emitter, is influenced by the credibility of its status. Greater credibility sometimes gets over indifference, antipathy or negative newsmongers. The ideas and experiences of well-known and professionally brilliant coaches with wide and profound expertise and, above all, recommended by the performances and records of their champions, are credible.

In this regard, there is a rich history.

In the opinion-forming process, the emotional-cognitive dissonance, which is a disharmonic and tensional phenomenon, should be avoided. Consonance and dissonance refer to the relationships that exist between various groups of cognitive elements possessed by an individual: knowledge, skills, opinions and beliefs about self as a knowledgeable subject, but also about one’s own behaviour (Golu, 2004, pp. 246-248). Dissonance exists cognitively, in the emotional area, but also between the two. Dissonance emanates from a committed act. To make a foul is against the rules and is penalised by the referee, but if a player “escapes” on the counterattack, the foul remains the only and last solution. However, emotional-cognitive dissonance should be avoided, because this is the prerequisite of solid learning. Consequently, trainers will be successful if they are guided by a motivating and rational psycho-managerial strategy.
Capturing the spirit of the times and mental processes

The Zeitgeist acts as an informational explosion, engaging the two mental spheres of the receptors: the cognitive and emotional ones. The intensity of mental activity is influenced, in the case of motor activities, by the kinaesthetic intelligence (we consider the bodily-kinaesthetic option to be more correct, because it also refers, in addition to movement, to the body structure and relationship; kinaesthetics is a bodily-neural property), as well as by other forms of intelligence. Adapting a new direction of action (structure: acts, actions - means, ways of approach, systems, techniques, physical and mental recovery factors, training environment etc.) involves forms of thought and a partial or total mind change.

Gardner (2006, pp. 2-3) says: “Changing minds is obviously difficult. But so many aspects of our lives are increasingly focused on this operation, for instance when persuading a colleague to relate to a subject by adopting a new attitude or when we are trying ourselves to get rid of some preconceptions, which has profound professional implications; academics, coaches, top managers, high-performance athletes etc. are those who make up the world of intellectual workers, people with developed bodily-kinaesthetic intelligence, who persuade trainees to think differently, to change their minds. Any form of change of thought relies on a cognitive background that reorganizes through a mind change. The actions on the mind should be rational, convincing: the coach persuades the performer to make changes in a preparatory exercise or a new exercise or to adopt another tactical plan by rationally motivating ‘why’; the physical therapist influences the recovering athlete to redefine him/herself”.

Leaders and creators of the Zeitgeist are those who make others change their way of thinking. The mind change aims to produce significant alterations and, for this, it is necessary to build clear representations in the trainee’s mind. Representations occur in the brain based on information, suggestions, tasks and especially ideas, which is why a representation is built from top to bottom. When images (live demonstration, film, video, photo, graphs or mental picture formation through passive movements) are presented, the representation is from the bottom up. In didactics, it is explicitly stated that combining explanation and demonstration will build a clearer picture of the motor task.

Gardner (2006) has identified 7 factors or levers that operate when a positive change occurs (the 7 R’s):

1. Reason. The appeal to reason matters enormously when personal beliefs are involved. In this respect, the identification of relevant factors, the assessment of each and their consequences play an important role. Reasoning implies logic, comparisons - analogies, models, classifications and, of course, solving dilemmas about the impact of some factors.

2. Research. It refers to the collection of data, if they have been evoked. Those with a scientific background resort to hypotheses, mathematical instruments, in order to detach what is relevant from what is less relevant. It is also important to take into account the opinions of those who are targeted for mind changing.

3. Resonance. Unlike reason and research, which are related to the cognitive aspects of the mind, resonance applies to our emotions. Appealing to one’s feelings and creating emotional resonance are very powerful means of changing minds. Gardner (2006) says that resonance may arise as a result of exercising reason and research; it is possible for the consent to be decided at an unconscious level, and resonant intuition conflicts with the sober opinions of the rational man. That is the cognitive. Goleman (2008, pp. 69-70) states: “The predominant model that circulates among cognitivists about the way in which the mind processes information has been deprived of the recognition that rationality is guided and can be limited by feelings. In this sense, the cognitive model is an impoverished look of the mind, which fails to explain the “Sturm und Drang” (the storm, the tempest consisting close to the intellect) of the feelings that adds flavour to the intellect.

4. Representational Redescription. A mind changing act becomes convincing insofar as it constituted as a representation in linguistic, graphical, numerical forms and, the most revealing, if the one whose mind has changed can explain and convince another of his or her change of mind. From our own experience, we can state that we have met coaches who gave up promoting a new idea in the concept or training of their performers as a result of rejecting an idea presented unconvincingly or causing emotional discomfort. Consequently, promotion by the precursor or launchers should be done in exemplary training conditions: explanations, demonstrations and a space-time and material context.

5. Resources and Rewards. This refers to the presentation or inventory of the advantages gained from applying an idea, a model etc., as well as to its appropriateness (rewards for opinions or way of behaviour). You change your attitude and “catch” the team.

6. Real-World Events or the social context in a narrow sense (coach, physician, organizer etc.) and in a broad sense (club, press, supporters, other organizations) – all have expectations at different events, competitions, mainly in terms of results, transfers of new athletes etc., which constitute the framework of complex assessments.
7. Resistance. This is a phenomenon difficult to overcome, especially in well-trained professionals with positive experience in their work. The system of knowledge and the successful casuistry represent a factor of rejection of the new, in most cases.

It is believed that the mind changing process is facilitated by bringing to the fore the cognitive perspective based on the latest findings of neuroscience, the way in which the mind works, the contributions of psychology, linguistics and other border disciplines involved in the sports phenomenon. The essential role is played by the mental representations built in our minds over time, which can be reformed, reconditioned, reconstructed, transformed, combined, altered or undermined. Let us recall how a coach thinks a new technical element or combination of links and elements in gymnastics for the pommel horse or other apparatus. Representations are in our hands and are practically unlimited. Academics examine student behaviour, habits and learning difficulties and seek solutions to change their attitudes and behaviours, change their mentalities. This is the Zeitgeist, which occurs almost at every encounter with students: some authors believe that the mind changing process is more frequently and decidedly rejected by mature and elderly people due to mental difficulties caused by aging, but it should not be forgotten that our brain is able to continuously create new neural networks until deep old age. The essence of our existence is self-awareness and the ability to focus attention, which mostly works as a muscle; it is the mind’s essential muscle: if not used, it begins to atrophy (Goleman, 2008, p. 24). As such, resistance to change is the effect of “intransigent ethics” that rejects other forms of action (spectators, fans of certain teams or former stars will certainly make comparisons with the new stars, and some of them will think: “Well, it is not the same as it used to be”). This reasoning is correct, but we should bear in mind that current results, which are superior to those in the past, are achieved in another social context, on the basis of new gained experience. Solving and mind changing are factors of progress.

Resistance to change is a mental state present in people whenever life imposes a new situation. In the field of sports performance, the fear of change must be reduced and unconditionally replaced by rationality. The continuous process of athlete’s adaptation to increasingly higher demands requires various efforts, transitions and returns to ranges of work involving different amounts, intensities and conveniences. The long-term repetition of techniques and types of effort has a favourable effect until the body gets used to them and its adaptive responses are more reduced. In these situations, changes are required through actions against super-automated skills and habits, with efforts scheduled by introducing various conditions and consequent modifications in the technical and tactical structures, but also the exercise parameters. A skill is changed by learning another skill. Currently, there is an intense struggle to restructure very well-established skills, especially to eliminate mistakes. Dragnea and Teodorescu (2002, p. 165) state that “adaptability is a form of trainability or the ability to quickly switch from a situation to another by optimising behaviour, implicitly functionality, according to the requirements of new situations”. Coaches specialised in middle-distance events believe that some exercises (their parameters) should be changed after 18-20 training sessions, because the body starts to have reduced adaptive responses by getting used to stimuli. In these cases, we can no longer talk about resistance to change. Change is necessary.

Conclusions

1. The spirit of the times is a spiritual reality reflecting self-awareness within a philosophical system that is entirely found in sport.
2. Sport, by its nature and organization, is the territory of performance, where the capability and competence that will influence the metabolism of the field are exploited.
3. General intellects are prepared minds that detect earlier than a population to which they belong what follows and is likely to happen, defining the directions in which performance will probably evolve.
4. The spirit of the times is exploited through the harmonious balance between cognitive understanding and emotional intelligence.
5. The potential of the spirit of the times to produce performance becomes exogenous by its values, being socially monitored and administered.
6. Cosmopolitanism is a defining feature in sport in an era of reflexive modernity, a perspective from which we understand the spirit of the times as a social reality.
7. Accepting and understanding the spirit of the times involves, besides predecessors, launchers and successors, other factors that become limiting.
8. The spirit of the times and resistance to change are differently perceived according to the professional level, age, openness to the new and intensity of the cult of performance.
9. Intellectual workers exploit and particularly explore the spirit of the times based on the high motivation of passion and persevering attitude and the full use of the bodily-kinaesthetic intelligence.

10. Neuroscience has brought the cognitive perspective, the fundamental role of representations and the victory of the feelings that add flavour to the entire process to the forefront of the spirit of the times.

11. Resistance to change is not influenced, in terms of intensity, by age or gender, but by the low professional level and the “comfort” of the routine.

References


IMPACT OF HOFFMANN REFERENCES ASSOCIATED WITH VIBRATIONS IN PERSONS WITH CEREBRAL VASCULAR POSSIBILITY POST STROKE

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Abstract. Spasticity is a common condition in a stroke that affects the quality of life and is an important financial burden. The study addresses the possibility of using exercises associated with indirect mechanical vibrations using elastic bands to reduce the Hoffman reflex in people with stroke. Spasticity is very common after stroke and can affect the health-related quality of life. The 26 subjects participating in the study were divided into an experimental group and a control group. At the end of the 12 weeks, both groups had a positive effect in reducing the H-reflex, but the experimental group was more efficient. The study demonstrates the effects of vibration-related physical exercises on the Hoffman reflex and the possibility of their use in combating spasticity. In conclusion, the kinetic program associated with indirect mechanical vibrations has reduced the Hoffman reflex, which is associated with a post-stroke decrease in spasticity in people with spasticity in triceps surae muscles.

Keywords: spasticity, H-reflex, vibration, stroke.

Introduction

Stroke is a major health problem both at the national and global level and is one of the greatest threats currently and in the future. According to the “Global Burden of Disease Study 2015” (2016), the incidence is 61,552 strokes per year, 1,900 strokes per 100,000 inhabitants, and the mortality rate is 54,272 deceased per year, accounting for 156.8 deaths per 100,000 inhabitants.

People who survive a stroke often have symptoms and persistent signs such as: paralysis of motor functions, sensory deficits, deficits of perception, balance, aphasia, depression, dementia or other deterioration of cognitive functions. Bonita, Solomon and Broad (1997) confirm that at least 30% of stroke survivors will present incomplete recovery, 20% requiring assistance for current activities, which affects the quality of life and represents an important financial burden for the affected person and his/her family. Such a burden is spasticity, Kooij et al. (2009) describing it as a common condition that typically affects the muscles of people with central motor neuron lesions (as is the case with strokes) or a palido-nigric lesion.

Lance (1980) defines spasticity as a motor disorder characterised by a rate-dependent increase in tonic reflexes (muscle tone) with exaggerated tendon reflexes resulting from the hyper excitability of the stretch reflex as a component of central motor neuron syndrome.

In 2005, the SPASM Consortium suggested that the definition of spasticity should reflect the reality of clinical practice and therefore expanded the definition: sensory and motor control disorder resulting from a central motor neuron lesion that is manifested through intermittent or continuous muscle activation.

Reducing spasticity is a matter of major importance for the maximum possible restoration of reduced or lost functional capacities by a person after cerebral affections caused by a stroke as well as for the development of compensatory and adaptation mechanisms.

From a physiological point of view, spasticity is caused by an exaggerated monosynaptic stretch reflex. Therefore, inhibition of the reflex is a priority in spastic recovery. Vibrations have a role in the inhibition of alpha related fibers by both presynaptic inhibitor mechanisms and by reciprocal inhibition.

In spasticity, the most prominent changes consist of a decrease in vibratory inhibition at a stimulus intensity lower than that required for a maximum H reflex and an increase in the H/M ratio. These results suggest that presynaptic inhibition is mainly reduced at a low-intensity level and that excitability of the motoneurons is increased.

Many studies (DeGail, Lance, & Neilson, 1966; Angel & Hoffmann, 1963; Delwaide, 1985) state that some of the mechanisms in the spine can be elucidated electro-physiologically through Hoffman by testing presynaptic inhibition of afferents acting on terminals Ia, excitability of motoneurons and interneuron activity.

Vibration is defined as a periodic motion of a body or of the particles of an environment, performed around an equilibrium position. Oscillation is the periodic variation in time of the values of a magnitude that characterises a physical system, accompanied by a transformation of energy from one form to another (“Vibratie”, 2009). Radeş (2008) describes the oscillations as dynamic phenomena characterised by the variation in time of a system state.
Vibrations are oscillations of elastic systems, i.e., movements of mechanical systems due to an elastic resilient force. Thus, an elastic bar or string vibrates, while a pendulum oscillates. All bodies that have mass and elasticity can vibrate.

When the device starts vibrating, its energy can be transferred in the form of vibrations, through direct or indirect contact, along with the anatomical structures. Vibrations act on the human body through the contact surfaces between man and the vibrant anatomical structure. All bodies that have mass and elasticity can vibrate.

Somatic-sensory stimulation promotes plasticity of the brain and vibrations are considered to be the most effective means of stimulation of proprioception. Reducing spasticity is a common and important goal of recovering subjects with stroke.

The purpose of this research is to reduce Hoffmann’s reflex in post-stroke patients. Achieving a recovery protocol that includes vibration-related exercises is the primary focus of the research.

Hypothesis: Vibration-related exercises reduce the Hoffmann reflex in people with post-stroke spasticity.

Material and methods

The testing was conducted in a private neurology clinic in Constanta from 12.01.2015 to 23.10.2015. Rehabilitation sessions were performed 5 times a week for 12 weeks, with an average duration of 50 minutes per session.

Two groups were developed, one in which people performed a classical exercise program and an experimental group where they performed a vibration-related exercise program. Participants in the experiment were 26 subjects aged 61.84 ± 5.3 years, distributed in two groups: 12 subjects in the experimental group and 14 subjects in the control group.

Among the inclusion criteria were subjects with stroke who had 6 months or more from a stroke and spasticity in the triceps surae between 1 and 4 on the Ashworth scale.

To evaluate the Hoffmann reflex, a Neurosoft Neuro-MEP-Micro electromyography device (Figure 1) was used to determine the H/M ratio (a measure of the entire pool of recruited motor neurons, which is influenced by pre-synaptic inhibition).

Figure 1. Neurosoft Neuro-MEP micro

Hoffmann Reflex (H reflex) is a test to evaluate the monosynaptic activity of the spinal cord. Reflex H differs from tendon reflex as it is activated by electrical stimulation, unlike the tendon that is mechanically activated, which shakes the muscular shaft by acting directly on the associated fibre (Figure 2).
The statistical program used to process the results of the electromyography is IBM SPSS v23 (Statistical Package for Social Sciences) and Microsoft Excel 2016.

Results

At the end of the 12 weeks, both groups experienced a reduction in the Hoffmann reflex, but the experimental group was more efficient.

The control group at the initial H/M ratio testing for the late-controlling control group averaged 66.829 ± 8.634. In final testing, after 60 minutes of rest, a result of 62.407 ± 9.648 was obtained representing a 7.08% decrease from baseline testing. Applying the Test T for dependent samples, the control group yields a value of t = 9.085, the difference between the initial and final averages being statistically significant at a significance threshold p < 0.05. The Cohen (d) of 0.483 is a moderate effect of practical applicability.

The experimental group in the initial H/M ratio testing for the late-onset experimental group recorded an average of 67.183 ± 5.415. In final testing, after 60 minutes of rest, a result of 60.117 ± 5.382 was obtained, representing a decrease of 11.75% from the initial test. Applying the t-test for dependent samples, the experimental control group gives a value of t = 11.513, the difference between the initial and final averages being statistically significant at a significance threshold p < 0.05. The Cohen (d) of 1.308 is a great effect with practical applicability. (Figures 3 and 4)
At the 12-week Effect-Imaging Electromyography test, the experimental group had an improvement of 4.67% over the control group.

**Discussion**

It was observed that the exercise program applied to the experimental group led to a decrease in the excitability of the motor neurons in the spinal cord immediately after application of the program and after 60 minutes of rest.

Meunier, Morin and Pierrot-Deseilligny (1987) assume that reduced reflex H inhibition appears to be primarily determined by reduced presynaptic inhibition, although other mechanisms, such as depletion of transmitters, may contribute to the vibration-induced suppression of reflex H.

Electrophysiological parameters (H/M ratio) can measure more objectively spasticity and can be used as part of a clinical evaluation. In 1963, Angel and Hoffman found an increase in the magnitude of reflex H in spastic patients. Some studies by Traversa et al. (2000) showed that compared to healthy subjects, a significant increase in H-reflex amplitude is observed on the spastic part in spastic patients.

Delwaide (1993) describes the H/M ratio comparing the total and a maximum number of motor neurons that are reflex-activated and are affected by excitatory and inhibitory stimuli, and shows a decrease in presynaptic inhibition level with excitability level of the motor neuron. The H/M ratio is reproducible and Milanov (1992) mentions that it correlates with clinical findings in subjects with spasticity.

**Conclusions**

The content of the experimental recovery program led to an 11.75% reduction in the Hoffmann reflex in people with post-stroke spasticity compared to the control group that contributed a 7.08% reduction.

These values, resulting from the initial and final evaluation with the electromyography, after 12 weeks of vibration-related exercises, lead to suppression of the Hoffmann reflex by altering the excitability of the motor neurons associated with reduced spasticity. The results demonstrate the possibility of exercises associated with vibrations in reducing spasticity in the calf. This confirms the hypothesis that "Vibration-related exercises reduce the Hoffmann reflex in people with post-stroke spasticity".

Applying vibration-related exercises in spastic recovery programs in stroke subjects requires further studies. Solutions must be found to maintain the gained effect and develop an exercise protocol based on optimal dosing of the amplitude and frequency of mechanical vibration.

**References**


DEVELOPING STRENGTH AND SPEED IN CHILDREN WITH SPECIAL EDUCATIONAL NEEDS AGED 16-18 IN ORDER TO OPTIMISE ADAPTED FOOTBALL GAME

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Abstract. In order to obtain an effective training of the optimally adapted general physical training, we have taken several instructional steps required to achieve a correct periodisation of the annual training plan, as well as the motor skills specific to the football game. In order for 20 boys with SEN (16 to 18 years old) to develop their speed and improve their strength they have been subjected to training with exercising involving attention, having as final result the rapid neuronal adaptation to achievement of the various objectives imposed within the training. Achieving learning and technical-tactical development was conditioned by the ability to adapt children with SEN to physical, technical, tactical and psychological stimuli. As research methods: method of documentation, study of literature, direct and indirect observation, talking, recording, experiment, statistic-mathematical, graphical and tabular method. Children have improved their speed and strength progressively over the preparatory period, which have led to specific adaptations for each and every stage. We present statistically their evolution in the direction of the two motor skills: strength and speed.

Keywords: children with SEN, speed, strength, football.

Introduction

According to Soare (2004) and Năstase (2003) children with SEN are usually at a lower level of physical development, their participation in the team for practicing sports games is very important. Team training is also important for the opportunities offered by children with SEN, demonstration of sports skills and contribution to team games.

The need to do sports, to move continuously, to play (even) in this institutionalised environment is what enables us to reconcile school with life so that the child with special educational needs overcomes the difficulties that are hard to defeat. UNESCO gives great importance to physical education and sports, highlighting, among other things (UNICEF Representation, 2006, p. 100): the beneficial effect on solving social, political and economic issues and is also a mean of reducing crime, violence and drug addiction; contributes to social inclusion, including in physically disadvantaged people, contributes to increasing labour productivity by improving the physical form of health; contributes to the prolongation of active working age, as well as to the improvement of the life for all categories of people. According to Motroc (1994) the acquisition of a skill bag and hobbies and action on the ball causes a higher demand of the sensory system, comparing the internal information with the external and verbal information, which favours the correct and economical learning of the football game technique.

According to Ciocă and Ciocă (2008), among the goals that football proposes through its contents as a means of adaptive physical education include: ensuring good physical development of the body, providing an optimal physical capacity.

The purpose of our research was to develop and implement motor skill training programs general and specific to adapted football in order to increase strength and speed in institutionalised children aged 16-18 years.

Hypothesis of the research. By using general and specific football-adapted programs for children with SEN aged 16-18 years, they can increase the strength and speed of experimental subjects.

Material and methods

In our study we used method of documentation, direct and indirect observation, talking, recording, experiment, statistic-mathematical, graphical and tabular method.

Participants

The experiment group of the research is represented by 20 children (boys) with SEN, aged between 16 and 18 of the Family-Type Găvana Centre, Pitești. The control group is represented by 20 boys with SEN (16-18 years old) of the Family-Type Our Home Centre, Pitești. In our research, we have subjects experiencing a mild mental retardation that is appropriate for an IQ between 50-55 and 70, the majority having behavioural problems,
requiring a functional, safe, secure family environment, to be involved in instructive and educational activities, to fill in educational gaps, to form intra-group relations skills and to develop communication skills.

Procedure

The context of the research is represented by the Family-Type Găvana Centre, Pitești. The Family-Type Găvana Centre, located in Pitești, is a family-type child protection service designed to provide the protection, upbringing and care of the child temporarily or permanently separated from its parents as a result of establishing, under the law, of the placement measure.

Development and implementation of speed and strength development programs in children with SEN (16-18 years) - according to the hypothesis of the research, the specific training program includes means for speed and strength development, intended for the next training periods, to which we added technical means: preparatory period, precompetitive period, competitive period, restoration period. Thus, the means used had as main purpose the development of speed, as well as learning, consolidation of the specific elements and technical procedures specific to the adapted football game.

For each training period we have established a dominant position as follows:
- in the preparatory period, it was acted for the gradual and rapid adaptation of the body of children with SEN to the basic training needs, in the improvement of the physical conditions, a great importance was given to the general physical training and also to the consolidation of the individual technique players, strengthening the collective game.
- during the precompetitive period, the psychomotor skills training was combined with action on motor skills and a specific program of speed and strength training was applied.
- in the competitive period, it was acted on the development of the power of striking, detachment, reactive, starting, accelerating by means specific to football, maintaining the speed and strength indicators at the levels achieved at the end of the preparatory periods.
- during the restoration period it was acted on acrobatic training, on work for poor muscle groups, respectively on those who suffered traumas, injuries.

During the training, we used means like:
- Basic exercises, which we divided into: exercises for general, multilateral, specific, physical training, exercises for technical training, exercises for tactical training (individual, collective and team), combined exercises in which relationships are established between physical training - technical training - tactical training. Psychological and theoretical training are implemented in the 4 categories of exercises previously recorded and permanent psychological counselling provided by the psychologist of the Foster Care Centre.
- The game itself: thematic game, school game, friendly games, traditional, verification games and official. According to Dragnea and Mate-Teodorescu (2002), the technique is a system of motor structures specific to every branch of sport done rationally and economically in order to achieve maximum efficiency in competitions.

In the research, we used programs that aimed to increase the maximum speed on distances of 20-30 m, we also had the objective of fast stopping from the running. The strength was applied in the preparation primarily by means of reactive power, acceleration and deceleration. Secondly, power and strength training helped the athletes develop their maximum speed and movement time. The exercises used solve the operational objectives of developing reaction speed, execution speed, acceleration speed and explosive strength (especially of the lower limbs) all in combination with the technical exercises specific to the adapted football game required in learning and consolidating the basic techniques specific to this sport.

Development tools used in our program:
- No. 1. Triggering the attack on the home field in 5 against 4 formation, having as operational objective guiding the balls on flanks and their transmission in the box from the left-right side of the 16.5 m box only through the cross (Figure 1).

Defenders may be semi-active at the beginning of the execution, and then become active with a direct task of dispossessing the opponent by sliding sideways at the moment of preparing the crossing of the players from the side. As a variant, it is possible to supplement the number of players and the occurrence of the overload by attacking in numerical inferiority with opponents on the semi-active and active defence stage in isolated game conditions.

Specific dosing: Repeat execution 6-8 X with a semi-active pause, while practicing continuous control of the ball by footwork and slight running followed by stretching sitting on the lawn.
No. 2. The players are arranged inside the 16.5 m box, in a number of 10, passing and sending the ball at half-height with and without pick-up, 5 by 5 numbered with different colour shirts, while in the semi-circle at the centre of the field the ball will be passed in the form of 5 against 2, upon the nomination by the coach of the numbers 2, 4, 1 etc., one member from a team and one from the other will move from the pass sector to the game sector in the centre, when the game of 5 against 2 will be triggered (Figure 2). The player who enters into possession of the ball by touch will bring his whole team in this sector, and the others will go to the ball-passing sector throughout the game.

Specific dosing: Repeat execution 8-10 X with a semi-active pause, while practicing continuous control of the ball by footwork and slight running followed by stretching sitting on the lawn or on the rug.

Results

**Evaluation of experimental investigations in motor skill tests**

- Speed tests

For the evaluation of the speed capacity, we used the 50-m sprint test assessing the level of training and the progress of the group under investigation according to the means applied in the preparation. We present the results obtained in Table 1 and Figure 3.
Table 1. Statistical parameters for the 50-m sprint test

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Experiment group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1</td>
<td>T2</td>
</tr>
<tr>
<td>Arithmetic mean</td>
<td>9.28</td>
<td>9.12</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.521</td>
<td>0.57</td>
</tr>
<tr>
<td>Maximum</td>
<td>10.1</td>
<td>10.0</td>
</tr>
<tr>
<td>Minimum</td>
<td>8.0</td>
<td>7.85</td>
</tr>
<tr>
<td>Mean difference</td>
<td>0.39 sec</td>
<td></td>
</tr>
<tr>
<td>Coefficient of variation</td>
<td>5.614%</td>
<td>5.888%</td>
</tr>
</tbody>
</table>

Figure 3. 50-m sprint - Graph of arithmetic means

Table 2. Difference between tests – 50-m sprint

<table>
<thead>
<tr>
<th>Testing group</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment group</td>
<td>9.28</td>
<td>9.12</td>
<td>8.89</td>
</tr>
<tr>
<td>Control group</td>
<td>9.26</td>
<td>9.11</td>
<td>9.01</td>
</tr>
<tr>
<td>Experiment group – Control group</td>
<td>0.02</td>
<td>0.01</td>
<td>-0.12</td>
</tr>
<tr>
<td>t-value – Experiment group</td>
<td></td>
<td></td>
<td>2.274</td>
</tr>
<tr>
<td>p-value – Experiment group</td>
<td></td>
<td></td>
<td>Significant &lt; 0.05</td>
</tr>
<tr>
<td>t-value – Control group</td>
<td></td>
<td></td>
<td>0.909</td>
</tr>
<tr>
<td>p-value – Control group</td>
<td></td>
<td></td>
<td>Insignificant</td>
</tr>
</tbody>
</table>

In the experimental group at the final test, there was an increase of 0.39 seconds as compared to the initial testing, so if the initial testing had an average of 9.28 seconds, the intermediate test (T2) has an average of 9.12 sec. upon the final testing the average obtained was 8.89. The coefficient of variability has values below 10%, which shows a homogeneous group (T1 - 5.614%, T2 - 5.888%, T3 - 6.051%). By further applying the t-test between the initial test and the final test it indicates a value of 2.274 and significant values for the differences between the tests. Comparing the arithmetic means of the two groups, it is found that in the final test the average of the experimental group is less than the control group average of 0.12 sec, while at the initial testing the difference is 0.02 sec, in addition for the experiment group. (Table 2)

- Strength tests

For the assessment of the strength capacity, we used the Standing long jump test, by means of which we assessed the level of training and the progress of the research group according to the means used in the training (Table 3).
Table 3. Statistical parameters for the Standing long jump test

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Experiment Group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1</td>
<td>T2</td>
</tr>
<tr>
<td>Arithmetic mean</td>
<td>1.39</td>
<td>1.43</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.079</td>
<td>0.06</td>
</tr>
<tr>
<td>Maximum</td>
<td>1.53</td>
<td>1.55</td>
</tr>
<tr>
<td>Minimum</td>
<td>1.25</td>
<td>1.30</td>
</tr>
<tr>
<td>Mean difference</td>
<td>0.08 m</td>
<td></td>
</tr>
<tr>
<td>Coefficient of variation</td>
<td>5.683%</td>
<td>4.615%</td>
</tr>
</tbody>
</table>

Figure 4. Standing long jump - arithmetic mean graph

By comparing the arithmetic mean of the two groups, it is found that in the final test the average of the experimental group is higher than the control group mean of 0.04 m, while the difference from the initial testing is 0.01, less for the experiment group (Figure 4 and Table 4).

Table 4. The difference between tests – Standing long jump

<table>
<thead>
<tr>
<th>Testing group</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment group</td>
<td>1.39</td>
<td>1.43</td>
<td>1.47</td>
</tr>
<tr>
<td>Control group</td>
<td>1.40</td>
<td>1.42</td>
<td>1.43</td>
</tr>
<tr>
<td>Experiment group – Control group</td>
<td>-0.01</td>
<td>0.01</td>
<td>0.04</td>
</tr>
<tr>
<td>p-value – Experiment group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t-value – Experiment group</td>
<td></td>
<td></td>
<td>3.619</td>
</tr>
<tr>
<td>p-value – Control group</td>
<td></td>
<td></td>
<td>1.829</td>
</tr>
<tr>
<td>t-value – Control group</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conclusions

Our experiment has shown positive results in the development of speed and muscle strength, as observed by the significant difference in results from initial testing compared to the final testing. Applying speed and power development programs completed by technical exercises in adapted football training (16-18 years) have helped to improve the level of technical execution and tactical behaviour thereof, which is confirmed by the achievement of the game tasks and of operational objectives. The use of training programs for speed and strength development exercises with the addition of a technical component has led to an improvement in the speed and strength of children with SEN (16-18 years) by improving the speed and strength ratios.

In the case of the 50-meter running speed test we can see that between the initial and final testing of the experiment group and comparing it with the control group performances, there is a significant increase in the initial level with a significance of the thresholds of 0.05, indicating that the content of the programs proposed by us was high efficiency during this period.

In the case of the standing long jump we can interpret that after processing the results between the initial and final tests of the experiment group and comparing it with the control group performances, there is a significant
increase in the initial level with a significance of the registered thresholds of 0.001, which indicates that the content of the programs proposed by us has been highly effective at this time. The research hypothesis which states that by using general and specific football-adapted programs for children with SEN, aged 16-18 years, can increase the strength and speed of experimental subjects is demonstrated.

References


PSYCHIC TRAINING AND THE FLOW STATE

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Abstract. As specialists in sport psychology and sport science fields we have always wondered which internal mechanisms are responsible for turning an athlete into a great champion. Mental training is an integral part of the training process, one of the most important objectives being the athletes’ awareness (based on relevant information) of the processes and bio-psychic phenomena that condition performance. The automatic character of the flow state (the state in which an athlete achieves his best performance) involves the prior existence of a consistent psychophysical training. When an action performed by an athlete occurs automatically, without a conscious control, creativity can also manifest - since only a relatively independent action can be inserted into the continuous flow of activity, generating a creative result. In high performance sports, peak experiences are not relaxing, passive, the muscles of an athlete can sore during the best moments... but those are perceived to be the most meaningful. As a result of systematic psychological training, in competition, athletes will succeed to enter in the trance state, altered by consciousness, into that state in which things just happen or flow.

Keywords: psychic training, flow state, adaptation.

Introduction

In the system of the training components, the psychic factor is given a special weight and importance (at least theoretically), supported by the fact that the psychic system has the role of motivation, command and control, for the human being, in the optimal adaptation to the environment. As it is well known in the specialised literature - the psyche subordinates the neurological and the metabolic system (Romila, 2004). The author considers that the main function of the psychic system is adaptation (direct and especially indirect - symbolic) to the natural and cultural environment.

The psycho-behavioural reactions (mostly) will be influenced by the internal condition of organizing the system: in humans, external conditions do not directly and mechanically produce reactions, but only on the basis of filtering, processing, by permanently reporting to the inner needs and possibilities of the individual.

Mental training includes all the organizational, educational, communication, intervention, self-regulation measures, which simultaneously satisfy the modern psychology criteria and the current exigency of the sports training (theoretical, psychic, physical, technical, tactical). It is an integral part of the unique training process in order to achieve the performance goal. Mental training involves organizing the training process on performance criteria, with immediate and forward-looking social objectives, as well as organizing training according to the psychic capacities of people involved in the training process. It is important to mention that the psychomotor and mental organization, the ability to organize the external and internal space depends on the level and quality of the psychomotor stimulation during childhood (Tüdös, Predoiu, & Predoiu, 2015).

When performing the psychological training of the athlete we will take into account that the psycho-informational structures of performance and their development are in correlation with the energy resources economy (Mitrache, Tüdös, & Predoiu, 2015). Operationally, we develop those mental structures in sports performance that manage the biopsychic resources of the athlete, with great efficiency, at the right time. This structuring depends, first of all, on the quality of the stored information and its update, at the appropriate time (e.g. in the competition context).

As Tüdös (2000, pp. 36-38) mentions, the major objectives of psychological training of the performance athlete are:

- Automation of motor acts - the transition from the external plan to the internal plan, from the conscious plan to the unconscious plan, from the regulator plan to the self-regulator, from the entropic to the anti-entropic one.
- Optimising the communication - is the key to the psychological training of the athlete; this is the “engine” of psychological development, in general and of psycho-physical (sports) performance, in particular. The coach is perceived by the athlete from a formative perspective extremely profound, knowing that a word from the coach can open or close the career of a great champion. Thus, suggestive-auto-suggestive verbal
training is operationally implemented by: 1) introducing in the mental system of the athlete the relevant information, which can become automated through training, acting autonomously internally, constructively; 2) the athlete's understanding of the complexes and problems, through the spoken or written word, which may eventually block or prevent him from obtaining motor performance.

- Awareness of the bio-psychic processes and phenomena relevant in performance - awareness will materialise in the training program based on relevant information. In training, information is transformed into conscious, guided and self-regulated acquisition, so that the athlete, in the competition situation, can activate it as a selective-informational program available at the right time.

The aim of our paper is to emphasise the importance of achieving a systematic (long-term) psychological training, in which, the relevant information (which becomes automated, acting internally) and, on its basis, the awareness of the bio-psychic phenomena important in performance, determines the increase of the athlete's skill level - a context in which the flow state will be easier accessed.

Topic addressed

During the competition, athletes can achieve unique states of consciousness as a result of their long previous training and intense concentration. The athlete can thus have a changed perception of time and a sense of high-quality performance, effortlessly achieved. In such moments, self-consciousness is diminished, and the individual is “totally” immersed in the game. It is therefore necessary to discuss what Csikszentmihalyi called, in 1975, a flow state (Predoiu, 2018, p. 129). The concept has existed for thousands of years under different names. Currently, we also find the following names: in the zone or performing, playing in a state of unconsciousness.

Csikszentmihalyi talks about the flow state as being the state in which an athlete achieves his best performance, apparently effortless, but with a total concentration and a sense of total control, without having thoughts of this kind. The athlete “totally” blends with the game and may experience a changed perception of time and a sense of high-quality performance. Self-awareness is diminished (moving away in the background) and attention is focused entirely on the work being done.

The flow state is an optimal state of intrinsic motivation (the athlete is engaged in activity for his own sake), a state characterised by a sense of great absorption (Ego decreases, time flies), accomplishment and competence - the athlete uses his/her skills at the highest degree (Gherghișan, 2019, p. 56). Over time, some top athletes discussed about effort instead of the lack of effort, many did not experience distortion of time or slow motion as effects of flow experiences. The most common element in the top-level athletes’ descriptions is the automatic character of the flow state - an action performed by a specialist occurs automatically, without a conscious control. Being on the field, the athlete does not think of tactics, because the right movement is obvious to him, running automatically; self-talk diminishes in competition (the athlete does not discuss with himself how to sit or how to play a point), leaving motor skills to manifest (Nideffer, 1992). And automatism is necessary for creativity, since only a relatively autonomous/ independent action can be inserted into the continuous flow of activity, generating a creative result (Dewey, 2004).

In high performance sports, the best moments (peak experiences) are not passive, relaxing (Csikszentmihalyi, cited by Gherghișan, 2019). In other words, the muscles of a tennis player or football player can sore during the best game, the fighter (for example, in K1 and Greco-Roman wrestling) or the runner may feel he cannot stand on his feet because of fatigue, but those are the most beautiful moments in their lives. The American psychologist (of Hungarian origin) spoke about the following components of the flow state: the balance between abilities and challenges, the clarity of the objectives, the extraordinary focus and awareness, the immediate and clear feedback, the control paradox, the change of time, the self-consciousness (diminishing) and autotelic experience.

In order to increase flow state and performance in junior athletes, relaxation in conjunction with imagery interventions were used - “tailored imagery script to target critical flow dimensions, namely challenge-skills balance, clear goals, concentration on the task, and sense of control” (Koehn, Morris, & Watt, 2014).

We present below the Flow Model, as described by Csikszentmihalyi in 2004 (Figure 1).
Arousal and Control are still good (see Figure 1). In the first case, an athlete is over-challenged (the skills are not as high as they should be) but he/she can move into Flow fairly easy. Arousal is the area where most people learn from because they are pushed out from their control zone and, in order to enter the Flow they develop higher skill. The second zone (Control) is also a good place for an athlete to be, because he/she is feeling comfortable, confident and can easily access the Flow by increasing the challenge.

Bob Beamon spoke about an increased state of concentration, during the 1968 Olympic Games in Mexico City (long jump event), when he set a new world and Olympic record - 8.90 meters, a jump that resisted as a world record for 23 years. Looking back in time, Beamon said he had no explanation for that jump. The American athlete felt that everything was perfect that day (the track, the start), but also his own state of concentration, managing to block all contact with the world. Under these circumstances, all the psycho-nervous energy (attention) was focused on the leap (Berkow, 1984, quoted by Dewey, 2004).

Basketball player Larry Bird said that at critical moments during the game, he felt that everything was slowing down (time expansion is noted) and the noises seemed to fade. Grossman, measuring the heart rate of Ron Avery, talks about the range between 115 and 145 beats per minute, when the best performances are obtained. Over 145 beats per minute, complex motor capacities begin to degrade, making it difficult to do something with just one hand. Over 175, cognitive processing capacity disappears altogether, the visual field narrows and behaviour becomes unusually aggressive (Grossman, cited by Gladwell, 2011, pp. 208-209).

Let us analyse next (Table 1) the answers given by 7 high-performance US athletes, on how to mentally approach the competition (Lebowitz, 2016).

Table 1. On the road to reaching the flow state – The effect of long psychophysical training

| The champions stated for: | Allyson Felix eliminates distractors. The 30-year-old athlete said: “When I head to the starting block, I am extremely focused. I see all the lights of the cameras, but I just don’t pay attention to them. I do not hear any noise around me. I am fully involved in what I have to do”.
| --- | --- |
| Sports Illustrated | Daryl Homer uses positive self-talk. Homer (fencing, currently 28 years old) has competed at the 2012 and 2016 Olympic Games (silver medal). He said: “Before the contest, I take time to reassure myself that I am the best and that I focus on the present. I watch some of Mike Tyson's videos and then I just try to have fun/ feel good and get ready for the competition”.
| The Washington Post | Michael Phelps (the holder of a statistical record - 23 gold medals won at the Olympic Games) visualises a plan for each scenario. In 2012, his coach (Bob Bowman) explained: “He'll see exactly the perfect race. And he will see it both from the outside
To increase the cognitions and feelings associated with flow, hypnotic interventions - “relaxation, imagery, hypnotic induction, hypnotic regression, and the conditioning of an unconscious trigger associated with the emotions of past peak performance” - were also used (Lindsay, Maynard, & Thomas, 2005; Pates & Cowen, 2013). Authors concluded that hypnosis may help athletes self-regulate and may improve performance during competition.

Conclusions

An integral part of the training process, psychological training involves organizing the training according to the mental capabilities of the athletes, one of the most important goals being the awareness of athletes regarding the bio-psychic processes and phenomena relevant for performance. The long psychophysical training creates the premises for reaching the flow state. In this state, athletes achieve their best results, with a total concentration and a sense of total control, they may experience a changed perception of time and self-awareness is diminished. The flow state supposes intrinsic motivation, the existence of a sense of great absorption, accomplishment and competence.
Outside the flow state, arousal and control are still good. Athletes can move into Flow fairly easy: when the task is a little more difficult, athletes can develop higher skill and when the task is a little easier (athletes are feeling comfortable) they can increase the challenge. Unlike these states, too much discrepancy between athletes’ abilities and the level of challenge generates anxiety, even worry (when the tasks are too difficult), or relaxation, even boredom (when the challenges are too low).

On the road to reaching the flow state, athletes deal with competitive stress in different ways: they use positive self-talk, eliminate the disturbing stimuli from the outside, think positively, constantly imagine the perfect technical-tactical executions, visualise a plan for each scenario (desensitisation) or block all contact with the world. We recommend the training of psychological self-regulation skills. The development of mental skills is considered a component of the whole psychological training of athletes. The mental abilities needed to be developed in the case of athletes are: cognitive (attentional, perceptive, body control, imaginative, positive thinking); of affective type (control of emotions, anxiety, stress, pain); volitional/ of action type (setting goals, mental training, relaxation, breathing, motivation, combativeness); which produce the structuring of personality traits (self-confidence, cooperation, communication). As a result of systematic psychological training athletes will succeed, in competition, to enter in the trance state, altered by consciousness, into that state in which things just happen or flow. Athletes will be so caught up in what is happening during the game (focused on the present - “hic et nunc”), task oriented) that they will not have time to worry, the reward consisting of the activity performed, living the moment and enjoying being on the ground.

Authors’ contributions

All authors contributed equally to this study and should be considered as main authors.

References

THE INFLUENCE OF PHYSICAL EXERCISE ON THE PERSONALITY OF OVERWEIGHT AND OBESE FEMALE STUDENTS AT THE BUCHAREST ACADEMY OF ECONOMIC STUDIES

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Abstract. The purpose of this study is to check whether there are personality-related differences between the results obtained by overweight and obese female students at the beginning of the research and their scores at the end of the research, after completing the physical exercise programmes. The sample selected for this study was made up of 50 female students aged 18 to 25 years, who were divided into two groups, the experiment group and the control group. The Zuckerman-Kuhlman Personality Questionnaire (ZKPQ) was used to assess the five factors needed to describe the personality structure: Sociability, Impulsive Sensation Seeking, Activity, Neuroticism-Anxiety and Aggression-Hostility. The study was conducted with an experiment group that benefited from complex physical training programmes specifically designed for overweight and obese female students and applied 3 times a week, and a control group, for which the ordinary programme of the physical education and sport lesson was used once a week. After applying the Wilcoxon test, statistically significant differences (p < 0.05) were highlighted in the Sociability, Activity and Neuroticism-Anxiety scales for the experimental group students compared to the control group students, where no significant differences were recorded. These results demonstrate that the application of complex physical exercise programmes specifically designed for overweight and obese female students positively influence the level of personality development, these young women improving their self-image as compared to those in the control group, thus becoming more self-confident, self-controlled, active and sociable and worrying less about trivial things compared to the initial period (before the experimental intervention).

Keywords: overweight and obese female students, physical exercise programmes, personality, self-image.

Introduction

The information provided by the literature on obesity highlights that it can alter the health status both physically and mentally. In fact, mental health is an essential dimension of the quality of life. For this reason, measures should be taken to prevent obesity, because it may cause the onset of disorders such as anxiety and depression, with a decrease in self-esteem and self-image. Based on experimental studies, Long and van Stavel (1995) emphasise the positive effect on the level of anxiety resulting from the practice of physical exercise, which shows the importance of physical training, with multiple influences on the body and the personality development.

Human personality is thought to be an extremely complex and dynamic reality. Consequently, it is a research object that requires a multidisciplinary approach. As a research object for several sciences, personality, in a broad sense, “represents the overall feature of man’s psychological life”, the man being considered as “a biopsychosocial unit” (Popescu-Neveanu, 1978, pp. 532-533) and “a bearer of epistemic, axiological and pragmatic functions” (Urzeală, Popescu, & Predoiu, 2014). Among the specific dimensions of personality, our focus is on Sociability, Activity and Neuroticism-Anxiety.

Purpose

Through this study, we want to check, using the personality questionnaire, whether there are statistically significant differences between the results obtained by overweight and obese female students (experiment and control groups) at the beginning of the research and their scores at the end of the research, after completing the complex physical training programmes, by investigating personality dimensions such as Sociability, Impulsive Sensation Seeking, Activity, Neuroticism-Anxiety and Aggression-Hostility.

Tasks

In conducting this study, we had the following tasks: applying the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ) based on which the assessment was performed; data collection; processing, analysing and interpreting the responses given by overweight and obese female students to the questionnaire items; drawing conclusions.

Hypothesis

Physical exercise in general and particularly the complex physical training programmes (Pilates, Fitness and Stretching) designed for overweight and obese female students have positive influences on the different
dimensions of personality (Sociability, Impulsive Sensation Seeking, Activity, Neuroticism-Anxiety and Aggression-Hostility), thus contributing to the improvement of self-image.

Material and methods

Subjects

The Zuckerman-Kuhlman Personality Questionnaire (ZKPQ) was applied to 50 female students divided into two groups, each group including 13 obese subjects and 12 overweight subjects aged 18 to 25 years. Of the two participating groups, only the experiment group was subject to complex physical exercise programmes systematically performed 3 times a week, while for the control group, the usual programmes of the physical education and sport lesson were applied once a week. The research was conducted over two academic years, namely from October 2012 to May 2014.

Methods

The research methods used were the following: bibliographic documentation, pedagogical observation, questionnaire survey, statistical processing (Labăr, 2008, p. 136), as well as the graphical and tabular method using the obtained values.

Description of the questionnaire

To investigate the fundamental dimensions of personality, we used the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ) based on the Alternative Five-Factor Model (AFFM) created by Marvin Zuckerman and his collaborators (Kuhlman, Joireman, Teta and Kraft). The original version of the ZKPQ was translated and adapted in Romanian by Opre, Kiss and Opre (Opre & Albu, 2010, p. 7).

This personality test belongs to the computerised psychological assessment platform “Cognitrom Assessment System”, being applied, both initially and finally, in the Psychology Laboratory of UNEFS Bucharest (in collaboration with Lecturer PhD Radu Predoiu).

The personality questionnaire included 99 items divided into five groups representing the five personality dimensions investigated by us, as follows: Sociability, Impulsive Sensation Seeking, Activity, Neuroticism-Anxiety and Aggression-Hostility.

The Sociability scale refers to the subject’s pleasure to get actively involved in social events by interacting with others, thus making many friends, and at the opposite end, the preference for individual (solitary) activities and the tendency towards social isolation are assessed.

Items of the Impulsive Sensation Seeking scale describe two factors: the impulsivity factor that refers to the tendency to act impulsively, quickly, without thinking in advance, and the sensation-seeking factor that refers to the general need for strong sensations, as well as the need for change and the preference for new experiences.

The Activity scale brings together items that refer to the need for being permanently in motion, the pleasure of performing physical activities, hard and challenging work including high energy-consuming physical exercise, but also items that highlight physical inactivity (low physical activity).

Items of the Neuroticism-Anxiety scale describe different states: on the one hand, states of concern, annoyance, sensitivity to criticism, lack of confidence in one’s own capabilities and, on the other hand, self-control, the ease of making decisions without worrying about trivial things.

For the Aggression-Hostility scale, some of the items provide information about the tendency towards aggressive (mainly verbal) expression, while other items describe a thoughtless, revengeful and brutal behaviour, showing a lack of patience in interpersonal relationships.

Before interpreting the scores achieved in the five scales of the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ), we analysed the score obtained by each subject using the Social Desirability scale (Lie or Infrequency). Generally, people whose score was higher than 5 for this scale did not respond honestly and wanted to make a good impression or were not focused, and therefore those questionnaires were not taken into account. The scores obtained in this scale by the investigated female participants were not “high”, meaning that they did not attempt to create a favourable image of themselves, giving honest responses when completing the questionnaire. Each questionnaire was accompanied by precise completion instructions.

Procedure

Intervention programmes for the experiment group consisted of fitness, Pilates and stretching exercises. These programmes were applied 3 times a week and each session lasted 60 minutes.
Each programme included:

- a part aimed at preparing the body for effort, with a duration between 10 and 15 minutes, where variants of walking and aerobic steps were used, as well as joint mobilisation and muscle elasticity exercises;
- the fundamental part, namely the programme itself, with a duration of about 40 to 50 minutes, where fitness and Pilates exercises for the main muscle groups were performed;
- a part for the body recovery after effort, with a duration of 5 to 10 minutes, where walking on the treadmill or stepper, along with stretching exercises, contributed to inducing the state of relaxation.

Results

The results obtained by applying the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ) to the 50 female participants were analysed and then statistically processed.

Experimental group – before and after the experimental intervention

Through this study, we checked whether there were statistically significant differences between the responses given by the female subjects included in this group at the beginning of the study and their scores at the end of the experimental study, after completing the training programmes, in terms of the different dimensions of personality: Sociability, Impulsive Sensation Seeking, Activity, Neuroticism-Anxiety and Aggression-Hostility.

Preliminary data analysis has revealed that there are no excessive - marginal and extreme - values for Sociability, Activity, Anxiety, Impulsive Sensation Seeking and Aggression. We exemplify with the Activity scale boxplot after completion of the physical exercise programmes specifically designed for overweight and obese female students (Figure 1).

![Figure 1. Extreme values – Activity scale after the experimental intervention (experimental group)](image)

Through the Wilcoxon test for two paired samples, we checked whether there were statistically significant differences between the results obtained by the experimental group students at both the beginning and end of the experimental intervention (after completing the complex physical training programmes) for each analysed dimension: Sociability, Impulsive Sensation Seeking, Activity, Anxiety and Aggression (Table 1).

Table 1. Results of female participants (experiment group) before and after the experimental intervention

<table>
<thead>
<tr>
<th>Scale</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>2</td>
<td>1.50</td>
<td>3.00</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>18</td>
<td>11.50</td>
<td>207.00</td>
</tr>
<tr>
<td>Ties</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impulsive Sensation Seeking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>9</td>
<td>8.11</td>
<td>73.00</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>8</td>
<td>10.00</td>
<td>80.00</td>
</tr>
<tr>
<td>Ties</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>4</td>
<td>7.50</td>
<td>30.00</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>16</td>
<td>11.25</td>
<td>180.00</td>
</tr>
<tr>
<td>Ties</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
After applying the Wilcoxon test, it has been highlighted that there are statistically significant differences between the results obtained at the beginning of the study (prior to the experimental intervention) and the scores recorded at the end of the physical exercise programmes as regards Sociability (p = 0.000), Activity (p = 0.005) and Anxiety (p = 0.002) (Table 2). Consequently, we can say that the female students belonging to the experiment group are more sociable, like more to be in society, seek to make more friends, are more active, practice more physical activities, are more self-controlled and worry less about trivial things at the end of the physical exercise programmes compared to the initial period (prior to the experimental intervention), which confirms the research hypothesis.

Control group – before and after (in the absence of an experimental intervention)

For the control group, we also checked whether there were differences between the results achieved by overweight and obese female students at both the beginning and end of the experimental study, in the absence of physical exercise programmes, for the Sociability, Activity, Neuroticism-Anxiety, Impulsive Sensation Seeking and Aggression scales.

Preliminary data analysis has revealed that there are no excessive - marginal and extreme - values for Sociability, Impulsive Sensation Seeking, Activity, Anxiety and Aggression in the control group, either before or at the end of the experiment. We exemplify with the Neuroticism-Anxiety scale boxplot after completion of the study (in the absence of a training programme specially designed for overweight and obese female students) (Figure 2).

![Figure 2. Extreme values – Neuroticism-Anxiety scale at the end of the experiment (in the absence of a physical exercise programme)](image-url)
Through the Wilcoxon test for two paired samples, we checked whether there were statistically significant differences between the results obtained by the control group students at both the beginning and end of the study (in the absence of training programmes) for each analysed dimension: Sociability, Impulsive Sensation Seeking, Activity, Anxiety and Aggression (Table 3).

Table 3. Results of female participants (control group) before and after (in the absence of an experimental intervention)

<table>
<thead>
<tr>
<th>Scale</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>14</td>
<td>10.54</td>
<td>147.50</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>4</td>
<td>5.88</td>
<td>23.50</td>
</tr>
<tr>
<td>Ties</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impulsive Sensation Seeking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>12</td>
<td>10.42</td>
<td>125.00</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>9</td>
<td>11.78</td>
<td>106.00</td>
</tr>
<tr>
<td>Ties</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>18</td>
<td>11.44</td>
<td>206.00</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>3</td>
<td>8.33</td>
<td>25.00</td>
</tr>
<tr>
<td>Ties</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>0</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>18</td>
<td>9.50</td>
<td>171.00</td>
</tr>
<tr>
<td>Ties</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggression</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>5</td>
<td>9.20</td>
<td>46.00</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>12</td>
<td>8.92</td>
<td>107.00</td>
</tr>
<tr>
<td>Ties</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the case of overweight and obese female students in the control group, low values have been recorded for Sociability, Activity and Anxiety through the Wilcoxon test, as well as a significance threshold value less than 0.05, meaning that there are statistically significant differences between the results obtained at the beginning of the experiment and the scores recorded after completion of the study. This means that the control group students are less sociable, prefer less collective activities, do not have enough energy and thus feel a reduced need to be in activity, do not want to practice physical exercise, do not have confidence in their own capabilities, are less self-controlled and worry about trivial things at the end of the study (in the absence of an experimental intervention) (Table 4).

Table 4. Results of overweight and obese female students (control group) before and at the end of the study – in the absence of an experimental intervention (Sociability, Impulsive Sensation Seeking, Activity, Anxiety and Aggression)

<table>
<thead>
<tr>
<th>Scale</th>
<th>Z</th>
<th>Asymp. Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociability</td>
<td>-3.856</td>
<td>.000</td>
</tr>
<tr>
<td>Impulsive Sensation Seeking</td>
<td>-1.67</td>
<td>.067</td>
</tr>
<tr>
<td>Activity</td>
<td>-2.816</td>
<td>.005</td>
</tr>
<tr>
<td>Anxiety</td>
<td>-3.171</td>
<td>.002</td>
</tr>
<tr>
<td>Aggression</td>
<td>-1.219</td>
<td>.223</td>
</tr>
</tbody>
</table>

*Based on positive ranks

b. Based on negative ranks

Conclusions

Analysing the results obtained in the initial and final tests with regard to the personality of overweight and obese female students, the following aspects can be noted:

The statistical processing of the results has led to the conclusion that there are significant differences between the two groups for the Sociability, Activity and Anxiety scales before the beginning of the study and after applying the programmes, which demonstrates that, as a result of the systematic practice of physical exercise, the
experimental group students are more self-controlled, more sociable, prefer to spend more time in society, have more energy and are more willing to practice physical activities at the end of the training programmes compared to the initial period.

The presence of statistical differences between the two groups, expressed by better results for the experimental group as regards the Sociability, Activity and Neuroticism-Anxiety scales, leads us to the conclusion that the use of physical training programmes 3 times a week induces positive changes in personality, improving self-image in the case of overweight and obese female students included in the experiment group.

References

ASPECTS ON THE PERCEPTION IN MIDDLE SCHOOL STUDENTS OVER PHYSICAL EDUCATION

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Abstract. Considering that, in this educational stage, the students involved are in full psychosomatic-physical development, we believe that physical education is important for research, therefore increasing its attractiveness as a curricular discipline for the youth and thus, facilitating their development, through participation is an aspect with multiple beneficial implications in their lives. Goal: optimisation of the physical education course and increasing its appeal to students. Objective: identification of the main aspects necessary for improving the students’ sports preferences. Themes: involving as many subjects as possible. The research has been done during the school year 2017-2018 on 200 subjects of Romanian nationality in grades 5-8 (two lower secondary schools). For data recording, analysis and processing in order to disseminate the results, we used specific methods, such as the social inquiry based on survey, conversation, pedagogic observation and mathematical analysis and processing, analysis and computer graphics program IBM SPSS Version 23 and Excel. The results obtained within this study show the fact that for increasing the attractiveness, efficiency and motivation of the physical education course, the students wish to have 3 weekly courses (44%) and to have introduced disciplines such as fitness (45%) and karate (39%). Conclusion: students from middle school are interested in course optimisation and in physical education and in order to increase its attractiveness, specialty teaching professionals can be trained in the disciplines desired by them and in the possibilities of expression through movement.

Keywords: middle school, physical education, attractiveness, fitness, development.

Introduction

According to the specialists in the area, physical education perception is different from person to person in what concerns their affinity toward physical education, perceived abilities, and preferences for coeducational and same-sex. The findings indicated that males perceived themselves to have significantly more skill, strength and endurance than females. Females perceived themselves to be significantly more overweight than males. Males also liked physical education significantly better, while females exhibited a systematic decrease in liking physical education from 6\textsuperscript{th} to 8\textsuperscript{th} grade. The findings are discussed in terms of implications for teaching and teacher education and the need for future research on coeducational and same-sex class structures in physical education (Treanor et al., 1999). The inconveniences of this discipline are: insufficient curriculum time allocation, perceived inferior subject status, insufficient competent qualified and/or inadequately trained teachers (particularly in primary schools), inadequate provision of facilities and equipment and teaching materials frequently associated with under-funding, large class sizes and funding cuts and, in some countries, inadequate provision or awareness of pathway links to wider community programmes and facilities outside of schools. More generally, there is disquiet over the falling fitness standards of young people, rising levels of obesity amongst children of school age and high youth dropout rates from physical/sporting activity engagement (Hardman, 2008).

An Analysis Evidence suggests that PE has the potential to make contributions to young people’s development in each of the four domains: Physical, Social, Affective and Cognitive. This dissertation investigates the perceived benefits of PE together with the impact it has in providing students with a holistic development. PE has been positively associated with numerous dimensions of psychological and emotional development. Additionally, PE also contributes and expands students’ cognitive domain (Mintoff & Ciantar, 2013). PE can improve children’s concentration and stimulation, which might indirectly benefit academic performance. Raising such awareness should attempt to persuade competent authorities and policy makers to value such beneficial experiences that PE can potentially offer.

In the article “Approaches to Physical Education in Schools” (2013), it is mentioned that through this discipline, reaching virtually to all children is guaranteed, physical education being the only sure opportunity for nearly all school-age children to access health-enhancing physical activities. High-quality physical education programs are characterised by (1) instruction by certified physical education teachers, (2) a minimum of 150 minutes per week (30 minutes per day) for children in elementary schools and 225 minutes per week (45 minutes per day) for students in middle school. They suggest that students are more physically active when they have physical education. Considering these aspects, the optimisation of the instructive-educational process within this discipline can be achieved by increasing teacher training efficiency, but also by allocating a higher number of
courses, which would determine positive effects in the physio-psychosomatic development of the pupils. In New Zealand physical activity is central to curriculum programmes in physical education, dance, and drama and is an integral part of education outside the classroom (EOTC) within all curriculum areas. It has a place, too, in other curriculum areas when learning activities involving physical movement. For example, students may exercise when learning to measure distances in mathematics or when role-playing an experience during English or social studies (Sport and Education New Zealand, 2006).

According to the specialists in the area, we can conclude that physical education has positive influences on the physio-psychosomatic development, being a curricular discipline with greatest impact on the evolution of students.

In order to develop this research, we have started from the following observations:

- No updated physical activities;
- The desire to create a survey for social investigation, to be applied at a time interval of 2 or 4 years in order to obtain a curriculum according to the vision, desires and actual possibilities of the students;
- The need to identify the point of view of the students on physical education;
- Absence of any analysis in this direction;
- The desire to get involved of many teachers at national level.

The need to know which the optimal number of physical education courses is in their opinion.

**Premise.** Our study is useful and interesting because it analyses the importance of the physical education course and its ways of development, by using an investigation tool that consists in an opinion poll focused on this direction.

**Purpose of the study.** Our purpose is to increase the attractiveness and efficiency of physical education courses by collecting and studying information from middle school students and then applying it to our curriculum. We think that by succeeding to create an effective curriculum model, we will be able to enhance the quality of courses and to optimise physical performances.

Our purpose is also to obtain the right information, which would guide the physical education specialists in enhancing physical education attractiveness.

Our research aims at contributing considerably to the optimisation of physical education courses by enhancing their quality. Modern investigation methods are usually used for obtaining data and for their interpretation, their importance making the difference in obtaining optimal results.

We also aim to underline the importance of our research and capture the interest of those willing to develop the quality of physical education courses. The best way to enhance physical education course and increase its appeal to students is to collect information related to its importance, means and methods of improvement from the students.

**Hypothesis.** By collecting information from students, we will optimise the physical education course and increase its appeal to them and by identifying the main aspects necessary for improving their sports preferences, we will be able to create a curriculum model for optimising the quality of educational process.

**Material and methods**

Within our research, we have focused on the following directions considered by us to be useful, modern and meant to bring an addition to the physical education courses:

- Do you believe that physical education and sports discipline represent an important part of school education?
- Are the physical exercises performed during the course beneficial to your body and intellectual development in a harmonious way and beneficial to your life?
- Is the physical education teacher the central element in increasing the attractiveness of the physical education courses?
- Do you believe that the quality of your life has been improved since the moment you actively participated to the physical education course?
- Do you believe that the usage of music would optimise (improve) the performances within the physical education course?
- What other sport disciplines would you introduce during the physical education course in order to increase its attractiveness?

The questions used in our research were formulated so as to obtain from students as much information as possible about physical education courses and the ways to develop them, about the most attractive means, about
the importance in the educational system of this discipline and new ideas for improving the quality of this curricular discipline.

For this research, we used the following methods: the recording method based on an opinion poll; statistical and mathematical method; computerised graphical method; observation method; bibliographical study.

The opinion poll used comprised 33 questions answered by a number of 200 students on A4 size papers. The purpose of the questions is to discover the best strategies for optimising the quality of the instructive-educational process. The statistical analysis was performed using IBM SPSS Statistics, version 23.

As for the bibliographical study, we consulted international materials of interest, which helped us to understand better the aspects and importance of the topic addressed.

The questions used in our research were formulated so as to obtain from students as much information as possible about physical education courses and how to develop them, about the important parts of the course, adding new sports disciplines and especially enhancing the quality of the means used during the courses. We will present only some of the 33 questions used in the questionnaire:

- Do you believe that physical education has an important role in improving your intellectual performance?
- Which part of the physical education course do you believe is the most attractive?
- Which part is the least attractive?
- Do you believe that it is necessary to restructure the contents of the physical education course?
- Is physical education a discipline more liked (attractive) than other disciplines?
- Are the physical exercises performed during the course beneficial for your body and intellectual development in a harmonious and beneficial way for your life?
- Do you believe the quality of your life has been improved since actively participating to the physical education course?
- Would a larger number of weekly courses be necessary for the physical education?
- Which would be the adequate weekly frequency for performing this school discipline?
- What new sport disciplines or activities would you introduce within the physical education courses?
- Do you believe the exercises performed during the physical education course determine positive effects in what concerns the quality of your muscle system?

Using the computerised graphics we expressed in percentage the results recorded from the opinion poll on the respondents’ point of view on the optimisation of the physical education courses.

Results

“The science of physical activities cannot dispense from a series of mathematical means, out of which the statistical ones are of great importance” (Tüdös, 1980, p. 5).

Following the performed research, we have observed the importance of quality in this curricular discipline and the special interest of students in enhancing its attractiveness, bringing consistency and quality during the physical education courses.

We have identified the following interesting aspects related by students in what concerns the physical education courses (Tables 1–4):

- The importance of this curricular discipline within school education is supported by 88.5% of the students, fact which reflects the necessity of optimising the quality of the teaching;
- Over 92% of the students consider that the physical education determines a positive state of mind;
- In what concerns the improvement of the intellectual efficiency, 70% of the students asserted that they optimised their intellectual performances through this discipline;
- The imperativeness of restructuring the physical education course is confirmed by 51% of the surveyed students;
- 81% of the students state that the physical education discipline is more attractive than other disciplines;
- A considerable percentage of students (78.0%) state that it would be required to allocate a larger number of courses for this discipline;
- A considerable percentage of students stated that an optimum frequency for the physical education discipline (Figure 1) would be 3 courses per week (44.5%);
- The highest trust rate was granted to the following sports activities (Figure 2): fitness (45%) and karate (39%).
• The physical education teacher holds the most important role in increasing the attractiveness of the physical education courses (71.5%);
• Over 69% of the students consider that the work space is a motivational stimulus in obtaining superior efficiency;
• 59.5% of the students consider that football is the most attractive among sports games, fact which reflects its positive influence;
• One of the motivational stimuli in obtaining superior physical performances is represented by using the musical background (59%);
• The evaluation based on the performances registered at the trials and according to the specific norms was selected as the constitutional evaluation type in 59%;
• The physical disciplines involving a superior attractiveness level and as a consequence, it would be necessary their introduction within this school discipline, are: fitness: 26.5%, badminton 22.5% and boxing 20%.

Table 1. Correlations existing within the research related to the PE lesson and the teaching professional

<table>
<thead>
<tr>
<th>Number of Valid Cases n = 200</th>
<th>Yes</th>
<th>No</th>
<th>I do not know</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you believe that physical education and sport discipline represents an important part of the school education?</td>
<td>Yes</td>
<td>132</td>
<td>9</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>I do not know</td>
<td>10</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>143</td>
<td>13</td>
<td>44</td>
</tr>
</tbody>
</table>

Table 2. Symmetric measures on the existing relations within the research related to the PE lesson and the teaching professional

<table>
<thead>
<tr>
<th>Number of Valid Cases n = 200</th>
<th>Value</th>
<th>Approximate Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal by Nominal</td>
<td>Phi</td>
<td>.263</td>
</tr>
<tr>
<td></td>
<td>Cramer’s V</td>
<td>.186</td>
</tr>
<tr>
<td></td>
<td>Contingency Coefficient</td>
<td>.254</td>
</tr>
</tbody>
</table>

Note: There is a correlation between the importance of the physical education and sport discipline in the school education and the fact that the physical education teacher considers that the students’ point of view is the key element in increasing the attractiveness of the physical education lessons: $p = 0.008 < 0.05$, and the value of C coefficient = 0.254.

Table 3. Correlations existing within the research related to the lesson and the specialised teaching professional

<table>
<thead>
<tr>
<th>Number of Valid Cases n = 200</th>
<th>Yes</th>
<th>No</th>
<th>I do not know</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you believe that physical education and sport discipline represents an important part of the school education?</td>
<td>Yes</td>
<td>137</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>I do not know</td>
<td>4</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>147</td>
<td>23</td>
<td>30</td>
</tr>
</tbody>
</table>

Table 4. Symmetric Measures on the relations existing within the research related to the lesson and the teaching professional

<table>
<thead>
<tr>
<th>Number of Valid Cases n = 200</th>
<th>Value</th>
<th>Approximate Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal by Nominal</td>
<td>Phi</td>
<td>.439</td>
</tr>
<tr>
<td></td>
<td>Cramer's V</td>
<td>.310</td>
</tr>
</tbody>
</table>
Contingency Coefficient  

0.402 0.000

Note: There is a correlation between the fact that the physical education and sport discipline represents an important part of the school education through the attention the teaching professional pays to the proposals coming from the students during the lessons: $p < 0.001 < 0.05$, and the value of C coefficient $= 0.402$.

Also, we have identified a series of existing correlations (Table 5, Figures 1 and 2) which should be taken into consideration in the current activity of the teaching professionals specialised in human motor skills, as follows:

- There is a correlation between the fact that the physical education and sport discipline is considered by students an important part of the school education due to the beneficial influence of the discipline on the sense of well-being ($p = 0.005 < 0.05$, $C = 0.263$), to the important role in improving the intellectual capacity ($p = 0.001 < 0.05$, $C = 0.366$), to improving the quality of life from the moment they actively participate to the physical education lesson ($p = 0.004 < 0.05$, $C = 0.269$), to the physical exercises performed during the lesson to the benefit of bodily and intellectual development in a harmonious and beneficial to life way ($p = 0.001 < 0.05$, $C = 0.292$), to the fact that at the moment of the instructive-educational act, the teacher is paying attention to the proposals received from the students ($p < 0.001 < 0.05$, $C = 0.402$) and the fact that within these lessons, it is offered the right to freedom of speech ($p = 0.01 < 0.05$, $C = 0.250$).

- There is a correlation between the fact that the students consider that the exercises performed during the physical education lesson and the sport games used, determine positive effects in what concerns the quality of the muscular system ($p = 0.019 < 0.05$, $C = 0.236$).

- There is a correlation between the fact that the usage of music would determine the optimisation (improvement) of performances in the area of this discipline and the fact that the physical exercises performed during the lesson are beneficial for the bodily and intellectual development in a harmonious and life beneficial way ($p = 0.006 < 0.05$, $C = 0.261$).

Table 5. Options of middle school students on new sports disciplines

<table>
<thead>
<tr>
<th>Sports disciplines</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Karate</td>
<td>78</td>
<td>39.0</td>
<td>39.0</td>
<td>39.0</td>
</tr>
<tr>
<td>Tae Bo</td>
<td>29</td>
<td>14.5</td>
<td>14.5</td>
<td>53.5</td>
</tr>
<tr>
<td>Fitness</td>
<td>90</td>
<td>45.0</td>
<td>45.0</td>
<td>98.5</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>1.5</td>
<td>1.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Which would be the weekly frequency adequate for performing this school subject?
Conclusions

One of the most important conclusions of this article is that the students from middle school are interested in optimising the physical education course and in order to increase its attractiveness, specialty teaching professionals can be trained in the disciplines desired by them and in the possibilities of expression through movement.

Over 78% of the surveyed students state that it is necessary to allocate a larger number of courses, fact which reflects the attractiveness and importance of this school subject in the national curriculum. In order to optimise the instructive-educational process, it is necessary to introduce new sports disciplines such as fitness, badminton, boxing, action which would determine an increase in the interest towards this discipline and an improvement of the physical skills of the students.

The surveyed students consider in proportion of 59% that the usage of the musical background would determine the optimisation of the physical performances and that implementing this would determine an increase in the attractiveness of the physical education courses.

An optimal model for enhancing the quality and attractiveness of our curricular discipline:

- at least 3 courses during one weekly micro-cycle;
- optimisation of the material base at the level of schools from pre-university system;
- introducing disciplines like fitness, karate and Tae Bo as sports disciplines during the physical education courses;
- usage of musical background within this curricular discipline;
- usage of means updated to actual requirements;
- frequent usage of social inquiries based on survey, to be applied after 2 or 4 years in order to obtain a curriculum in accordance with the vision, desires and actual possibilities of the students.

We believe an action at national level would be beneficial for face-lifting this curricular discipline, action performed by the specialty teaching staff with the purpose of identifying the vision and desires of middle school students, its upgrading being a sine-qua-non condition for increasing its attractiveness and for reaching our goal, tasks and objectives.

We intend to perform scientific researches in the future vis-à-vis the influence in the systemic and physiological plan at this age category, using sports disciplines close to the interests and desires of the gymnasium students (karate, Tae Bo etc.), as compared to those already established in physical education (football, basketball and handball) in connection to a larger number of lessons (3-4) as compared to the actual one, for an objective evaluation of the model proposed.
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OPTIMISATION OF THE PHYSICAL EDUCATION PROCESS IN PRIMARY SCHOOL

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Abstract. Like other aspects of social life, the field of physical education is an important vector of the concerns aimed to optimise it in all respects. This involves the development and implementation of particular strategies objectified at a national, regional or institutional level in order to improve the educational path of the direct beneficiaries, namely students. Physical education must provide, through the available means, a highly comprehensive educational influence on the entire group of students. But the visible beneficial effects of physical education activities depend on the value of their content (reflected in the syllabus), the system of requirements, the quality of the teaching process and the technical and material facilities. We believe that two fundamental aspects can be addressed: the first refers to the status of school physical education as a teaching subject, an academic subject, and the second (derived from the first) aims to improve the curriculum and implicitly the system of evaluating the school learning outcomes for the physical education subject. An optimised curriculum, which allows teaching the student only the knowledge that society really needs and which is maximally exploited, will give graduates the chance to become “winners” also in their lives. The modernisation and optimisation of the educational process involves the complex reconsideration, re-evaluation of everything that has proven to be valuable in the physical education process, as well as the implementation of new elements required by current education.

Keywords: optimisation, quality of the teaching process, technical and material facilities, efficiency and creativity.

Introduction

Nowadays, more than ever, in a society characterised by accelerated dynamics, education is facing and must cope with new challenging tasks.

Optimising the educational process in accordance with the new developments of science and the requirements of modern society involves reconsiderations and improvements in the field of didactics. This entails widening the framework of approaching and nuancing possible solutions, because there is no infallible method of learning or no infallible method of teaching. Addressing the problems that arise must be done with maximum seriousness, efficiency and creativity.

Therefore, the teacher-student interaction is mainly oriented, in the educational process, towards solving a certain number of tasks and, to a lesser extent, allows solving other tasks of education. Likewise, it could be schematically shown that each of the types of education is commonly used to study a particular content in the preparation of students with different levels of initial training. For this reason, the specific content of the material, the range of tasks that can be more successfully accomplished and the students’ age particularities must be taken into account, possibly making recommendations on the use of variants of approaching education in the case of poorly trained students and those with school failure.

In this respect, human action is closely related to the idea of change, exercising influences on someone (children/students), provoking a situation, modelling, consciously transforming.

Some of the optimisation criteria can be:

- expectation of the best possible outcomes in the process of building knowledge, abilities, skills, some personality traits;
- the minimum amount of time spent by students and teachers to achieve the intended outcomes;
- the admissible effort provided by students and teachers to achieve the intended outcomes;
- a more reduced use of the means, as compared to the typical ones, in order to achieve the intended outcomes within the allotted time etc.

In the pedagogical literature, there is tendency to consider synonymous the notions of optimally structured education and programmed education, through which one can maximally take into consideration the individual particularities, the rhythms of school activity and the successful achievement of self-control during the learning process. Without denying the positive aspects of programming in the work with students, especially with the poorly trained ones, we should mention the lack of justification for such an identification, because just the too rigorously programmed education can become a cause of the independent spirit development in students, especially the older ones, being thus able to determine the non-optimal character of the educational process.

In the pedagogical literature of recent years, different approaches to the optimisation of pedagogical systems and processes have emerged.
The ideas of optimising the educational process are often presented in close connection with the issues related to the scientific organization of pedagogical activity. Some believe that the optimisation principle is a particular case of the scientific organization of didactic activity, while others think that implementing the optimisation principle involves certain elements of the scientific organization and relies on them.

Thus, the phenomenon of optimising the educational process and the one regarding the scientific organization of didactic activity are closely linked. Optimising the educational process mainly involves not only the scientific organization of teachers’ activity, but also the scientific organization of students’ school activity. It should be noted that this scientific organization of students’ school activity is not oriented towards a simple increase in efficiency, but towards achieving optimal outcomes in relation to the concrete conditions. Therefore, optimisation is based on the scientific organization of the activity performed by both teachers and students and is focused on achieving maximum outcomes in the given specific conditions.

It results that the parameters to be optimised are bilateral, requiring the analysis of teachers’ activity in a dialectical unity with students’ activity, in complex structural relationships with the acquisition process.

The optimum, meaning the best, is the solution given to a particular management problem, and optimisation is the process or sequence of procedures or methods that allows identifying the optimum.

Basically, the optimisation theory predicts that, out of all possible variants to carry out an activity, there is objectively at least one solution which is more convenient than the others and is able to best achieve the intended purpose.

**Topic addressed**

*The concept of optimisation*

The concept of optimisation is defined as follows: “finding the best or most favourable solution to achieve the intended purpose” (Gagea, 2010); “the action of making the best or most effective use of a situation or resource” (“Optimization”, 2018); “the fact of optimising; making the best of anything” (“Optimization”, 2017).

To optimise means “to make something as good as possible” (“Optimize”, 2016); to make the most of; to develop or realise to the utmost extent; to obtain the most efficient or optimum use of (“Optimization”, 2016).

Defined from the current perspective, optimisation in education represents the process of maximising the education system that ensures efficiency and quality in the formation/development of student’s personality, which manifests through the values acquired during the teaching-learning process. In this reference context, the optimisation indicators/criteria are efficiency and quality.

In recent times, a number of pedagogical research studies have addressed various aspects regarding the optimisation of the educational process. For example, Ogorodnikov (2014) analyses one of the most important issues for the optimisation of the educational process, highlighting the need to optimally combine different working methods. Based on the complex experiment methodology developed by Ogorodnikov, research has been carried out on the following current issues:

- the combination of methods based on the teacher’s oral presentation and explanation of knowledge with methods focused on the independent activity of students;
- the comparative efficiency of methods for the current and subsequent strengthening of knowledge;
- the comparative efficiency of students’ independent replication activities and various ways of combining them;
- the comparative efficiency of front and individual activities performed by students;
- the comparative efficiency of checking and evaluating the students’ knowledge within different lessons and themes etc.

Competency-based education involves a system approach to the teaching-learning-evaluation process.

Thus, in order to build up the scientific knowledge competence, the teacher has to design in his/her system all components of the educational process, namely: the fundamental knowledge system, the system of lessons within the learning units, the system of interactive methods, the problematic system etc., being capable to optimally select the structure of the process aimed at forming the school competence according to the specific classroom of students.

Therefore, the formation of school competence is only possible by designing an optimal system that will ensure the highest efficiency and quality.
Physical education is a component of education expressed through a type of motor activity that has forms of organization and rules and aims at optimizing the individual’s biomotor and psychological potential in order to increase the quality of life.

Any educational approach must start, on the one hand, from the knowledge of the normality level in the motor and psychomotor development during ontogenesis, and on the other hand, from the specific level of an individual. Knowing the general aspects common to the subjects of a certain age becomes a prerequisite for the efficiency of an activity (Pană, 2015).

Younger schoolchildren are known to get emotionally involved in the activities they perform, and their interest in studying is at an early stage, especially in the case of those who have just started school. Their interest in the learning activity, including physical education, must be stimulated by training various internal and external “triggers”.

Optimisation involves increasing efficiency not by any means, but by using the most advantageous ones for a specific situation.

The dynamics of the means used must reflect the dynamics of student development. Ensuring the fulfilment of this requirement is only possible if a sufficiently operative study on primary schoolchildren is undertaken in order to highlight the progress in their development rather than simply recording their level of development at the time.

In addition, teachers need to take into account the specific possibilities of the classroom they are working with, so that, in the selection of educational means, they use the qualities of the students in that classroom and seek to stimulate the less developed sides.

It is important to detect the students’ various possibilities: intellectual, volitional, emotional and biological ones, their life experience, level of education, motivation for learning, interests, needs, life principles, plans etc.

First of all, the students’ age particularities should be considered, and then the specific possibilities of the classroom, groups of students and each individual student. Another aspect that should be taken into account is the typical ratio (for the given age) between the intuitive and abstract methods, the ratio between the presentation of the material by the teacher and the students’ independent activity.

It is also important to take into consideration the particularities of the surrounding environment, the provided material facilities and school hygiene conditions, as well as the teachers’ individual capabilities.

Therefore, we believe that the main methodological requirements regarding the selection of an optimal structure for the educational process are the following:

1. comprehensively integrating, by the selection process, all basic components of the educational process;
2. using all teaching principles;
3. successively taking into account the educational objectives, the possibilities of the system, the educational tasks, the specificity of the content and forms of organization;
4. taking into consideration the dialectic nature of the means and types of education, their basic orientation towards solving a certain number of tasks, the existence of stronger and weaker points in each of them, the need to rely on the strong points and neutralise the weak ones;
5. orienting the choice towards the rational variation of educational means in order to maximally take into account the students’ particularities and the complex solution of all educational tasks;
6. dynamically approaching the choice of the process structure, which reflects the dynamics of the system where education takes place, namely excluding the choice of stereotyped educational structures for the students of a classroom and changing the character of education concurrently with student development.

Presently, the lesson continues to be the main form of organization of the educational process. As a basic form of organizing the teaching approach, the lesson provides, in the current conceptual and methodological context, the most appropriate framework for conducting the teaching-learning activity due to the relative stability and homogeneity of the group of students, its constant duration, the number of weekly hours, its position in the time schedule, the available technical and material facilities, being also preferable throughout the entire educational cycle.

Although included in a system of lessons designed to achieve the specific reference objectives of each learning unit, the lesson also has a degree of independence reflected in the generic and differentiated operational objectives, the detailed content, the learning activities, the resources and types of evaluation used, all of them meant to highlight the specific contribution and results obtained in that lesson, which is understood as a stage in achieving the designed learning unit.

Younger schoolchildren are at the stage of concrete operations. They mainly learn by intuition and direct manipulation of concrete objects, and physical activity replicates, between certain limits, the physical space in which they develop.
In children, the mind is as active as the body. They are curious: they want to discover how things work. Taking into account their need for movement, we can lead the student towards an enquiring, exploratory, discovery-oriented attitude.

During classes, the outcomes, the school achievements and their significance, as effects of the joint teacher-student activity, will be evaluated.

To achieve the proposed objectives and tasks in order to reach the educational ideal in school physical education and sport, a decisive role is played by the combination between specific and non-specific means, as well as the choice of the necessary didactic strategy.

These outcomes may reflect in:

- the cognitive field: authentic understanding; ability to capture the essence; goal-oriented performance – activities; their degree of success – accomplishing a learning task, exploring, finding original solutions to various tasks;
- the emotional-attitudinal field: positive attitudes towards the activity; interest in the participation values and responsibility; feelings, beliefs, emotional, volitional and cognitive manifestations in everyday situations; self-analysis and self-esteem, critical spirit, creative (divergent) thinking;
- the psychomotor field: practical abilities and skills; ability to apply the acquired knowledge (transferability); ability to interpret; ability to retrieve information.

Conclusions

Physical exercise and movement games strengthen willpower, foster patience, self-control, courage, initiative, perseverance, discipline and develop feelings of friendship, collective spirit and self-confidence.

Physical education has its well-established role in primary school activities.

It is worth mentioning that any limitation or decrease in the motor activity of the child has consequences on the functions of the body, their desire for movement resulting from physiological causes.

All types of physical education activities aim, besides strengthening the body and the health status, to increase intellectual capacity and morphofunctional indices, as well as to create good mood.

The particularities of the growth and development process in primary school students underpin the action technology.

The analysis of the physical education aspects in primary school reveals that, in order to achieve the objectives of physical education, there are several favourable conditions for the researched topic.

The model of the primary school graduate should have a correct and harmonious physical development, master the basics of general motricity, execute correctly and with increased efficiency the basic and utilitarian-applicative motor skills, correctly and easily perceive the space-time components and be aware of the own possibilities for action.

However, some problems are also highlighted, and their solving would lead to the substantial optimisation of the instructive-educational process. At this point, it is mentioned the low level of practicing sports games (handball, for example) with only isolated technical elements.

It is hard to control a society allowing the development of personal talent, the educational system is rigid and currently it is quite difficult to create the necessary framework for developing the talent of each individual.

All this leads to the conclusion that, in principle, solving the problem related to the optimisation of the educational process is possible only when the teacher masters all components of the process taken separately and proves ability in choosing the most advantageous structure of the educational process, in the given conditions, persistently concretising this structure by taking into consideration the conditions of the given school and classroom, as well as the particularities of each individual student.

References

STEP BY STEP IN PHYSICAL EDUCATION AND SPORTS LESSONS

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Abstract: In recent years, school has become less and less attractive because of the poor motivation from society and the numerous enjoyable options to spend free time. Physical education and sports teachers must know the students with whom they interact in order to design and apply those solutions that lead to individualisation, with the purpose of attracting children to school, especially to sports activities. Physical education is a component of general education, along with moral, intellectual, aesthetic, physical and technical/professional education. All these components form a system and mutual relations are established between them. In the educational process system, the Physical education and sports subject contributes to training an energetic child with an intellectual and physical potential meeting the requirements of today’s society. The effect of the teaching-learning relationship should be a well-defined final goal, that of implementing the educational ideal. But for this, the capability of students must be exploited through new methods and means able to improve the teaching-learning process. In the post-December period (1995), alternative pedagogies were introduced in our country, mostly as a result of private initiatives. Step by Step is one of the methods that can make substantial contributions to the teaching-learning-assessment process in the Physical education and sports subject.

Keywords: alternative pedagogy, methods, Step by Step, physical education and sports.

Introduction

Due to its openness and interaction with advanced educational systems in the world, Romania has been given the opportunity to restructure and reform its own educational system, which tends to become unattractive for students. Over the years of transformation, measures have been sought, accepted and adapted in order to provide a student- and outcome-centred education and thus increase the efficiency of the teaching-learning process. In this respect, alternative pedagogies applied to different school subjects and levels of study represent, in our opinion, a way to follow.

Current level reflected in the literature

This paper is a review of the literature on alternative pedagogies and the extent of their use in recent decades both worldwide and in Romania, with an emphasis on the Step-by-step method.

Alternative pedagogies are forms of school organization that propose methods of organizing and conducting the teaching-learning activity, other than the forms specific to a period or occurring in a particular social context. Any alternative promotes different ways of achieving the educational outcomes. Alternative pedagogies, along with traditional education, should complement each other rather than eliminate each other.

In the last decade, educational reform measures have attempted to meet the needs of an increasingly diverse population of students (Atkins, Bullis, & Todis, 2005; Lehr & Lange, 2003).

The idea of alternative schools emerged in the late 1960s, when their popularity increased due to the ambition of creating progressive and innovative approaches to common, traditional teaching-learning-assessment practices. Only in the 1980s, alternative schools began to be used as a remedial measure for children who were “struggling” in traditional schools (Lehr & Lange, 2003).

The use of alternative pedagogies grew exponentially in the 1980s and 1990s in response to high dropout rates, truancy, school failure, juvenile delinquency and other factors. Alternative education continues to thrive as social problems, including school violence and dysfunctional families, create new challenges for communities and states. Its aim is to provide students who have not succeeded in the traditional school setting with other opportunities to receive an education (Siegrist et al., 2010).

Examining the alternative diversity, Lehr and Lange (2003) have reported that the instructional materials and curricular content may be the same as or very similar to those of regular education, but the delivery model, student involvement and assessment may vary.

In 1994, the Soros Foundation for an Open Society disseminated for the first time a new educational concept dedicated to preschool children from families with a disadvantaged socioeconomic situation, believing that these drawbacks would lead to poor school performance, which, in turn, would hamper the economic opportunities that disadvantaged children might have in their adult lives. To counter these influences, the Step-by-Step pedagogy attempts to help children develop equally with the others (Haskins, 2004).
In addition to education-related services, this programme also provided health services and encouraged parent implication in all activities of the programme (Deming, 2009). Originally called Head Start, it was popularised in 15 countries in Central and Eastern Europe. Since 1995, the programme is known as Step by Step, a licence name for all countries where it has been applied.

The Step-by-Step programme implements the national curriculum and national standards, is adapted to local culture and, at the same time, integrates standards and best international practices in the field of preschool and school physical education (Ciucureanu, 2011, p. 52).

According to the study conducted by Abbott-Shim, Lambert and McCarty (2003), students who have attended Step by Step classes have better outcomes than those who have not done this, as confirmed by their parents too.

Ensuring consistent quality is one of the biggest challenges in education systems. The ISSA (International Step by Step Association) pedagogical standards have been implemented in 30 countries, including Romania (in many counties) and provide an interesting example of how educational experts from several countries can agree on basic indicators to deliver quality education.

Results of implementing alternative pedagogies in Romania

In Romania, there are currently 904 school units using the Step-by-Step teaching method and 1140 classrooms totalling 28,428 students spread across the Municipality of Bucharest and several counties: Dâmbovița, Bihor, Maramureș etc. (Figure 1). Also, the number of both Step-by-Step classrooms and students who have learned on the basis of this alternative pedagogy has increased considerably (Figure 2).

![Figure 1. Distribution by county of the Step-by-Step alternative pedagogy for the school years 2015-2018](image1)

![Figure 2. Evolution of the number of Step-by-Step classrooms and students in the school years 2015-2018](image2)
This alternative considers the child as being unique, growing and developing at his or her own pace, which leads to the knowledge and observance of each one’s level of development. Depending on the age and individual characteristics, teachers will provide specific and appropriate materials and activities. Through active learning, the child develops his or her skills and gradually gains knowledge. At the same time, it should not be denied that, for certain developments, the child is dependent, in cognitive and emotional terms, on other children or people in the course of activities carried out throughout life.

The programme focuses more on developing the “whole child” than on academic training through instructional methods, even if the completion of a more academic programme has been proposed in recent years (Haskins, 2004). Teachers have the mission to help children make decisions and take responsibilities. Therefore, it is very important for them to know the age group they teach, the way in which children learn, but also their personality; such knowledge underpins the design of lesson plans and the implementation of individualised training.

Lately, it has been noticed an increased focus on both the learning process and students, including student cognition (Solmon, 2006), student-centred teaching (Oliver, Hamzeh, & McCaughtry, 2009) and student motivation (Haerens et al., 2013).

This pedagogy has the same curriculum as traditional education, but the teaching method is different. School subjects are structured according to the needs, capabilities and interests of the child. The Step-by-Step programme takes into account the requirements of the curriculum, but adapts and organizes them according to the needs of each child.

Teachers involved in the Step-by-Step programme facilitate learning instead of controlling it. They ask questions, answer children’s questions, provide them with resources and interact with them during work. Teachers notice how they behave in the activity centres, record and evaluate their observations. Individualised training will be planned on the basis of these observations. The teacher-student and student-student relationships are reported as a quality of alternative pedagogies (Lange & Sletten, 2002).

To achieve individualisation, teachers use a different structure of the lesson. This structure includes those didactic components contributing to the competent development of children (Grolnick & Pomerantz, 2009). Teachers organize the classroom into 6 centres of activity: reading, writing, mathematics, science, arts and construction.

This Step-by-Step alternative pedagogy, which is based on activity centres, observes several principles:
- Each classroom has two teachers;
- Teachers supervise and provide students with information, but are not in the focus of attention;
- Discipline is imposed through the specific methods used during the activity;
- The education process is student-centred, individualised. Work is performed within 6 activity centres, each one having 4 to 5 students;
- Group work (by activity centre) encourages children to learn independently and help each other;
- Each activity centre addresses another school subject, and the work time is variable, depending on the specific themes of the day;
- The child learns at his or her own pace;
- Assessment is done with the help of “proficiency notebooks”, without using grades or ratings;
- The classroom is equipped with many teaching aids that address all senses and stimulate students in the learning process;
- The child works wherever he or she wants, moves through the classroom, talks with classmates and can choose to work in a group;
- Parents are directly and actively involved in the learning process.

This pedagogy is applicable to all school subjects, except for physical education and sports, where the teaching method is a traditional one.

In our opinion, the above-mentioned alternative pedagogy could also be implemented in physical education and sports lessons, with the necessary adjustments to the specific curricular area. Thus, during physical education and sports classes, we can organize workshops containing various tasks. Example: in a workshop, students can look at pictures or watch didactic videos showing the way and stages of learning an exercise, in another workshop, they can use their motor skills by practicing, learning, strengthening or improving an exercise, and another workshop could include examples from students in order to identify the usefulness of exercises learned during the physical education and sports class and their applicability in everyday life. During the lesson, the child has to go through all the workshops proposed by the teacher, thus passing through a process of awareness, from abstract to concrete learning.
Also, since this pedagogy does not use grades or ratings, but only makes recommendations, competition is eliminated, which is why the performance of each child does not really matter. Eliminating competition can lead to increased motivation, because students do not feel marginalised but accepted by their teammates in the proposed activities. To identify students’ motivational resources, teachers should show interest in each one’s preferences and listen to all of them. When physical education and sports teachers provide positive feedback, students feel capable to engage in the required activity (Koka & Hein, 2005; Mouratidis et al., 2008). By knowing the capabilities and difficulties of their students, teachers can combat negative feelings that may arise during physical education and sports classes (Reeve et al., 2002; Jang, Reeve, & Deci, 2010).

Conclusions

This study, which aims at a better understanding of the Step-by-step alternative programme, shows that the exploitation of valences can result in developing a new teaching vision able to guide the teaching-learning-assessment approach. It also reveals that a teaching process focused on the needs of the child can stimulate motivation for active and creative participation in their own training.

The Step-by-Step alternative pedagogy can be implemented in the Physical education and sports subject by organizing workshops based on student-centred teaching strategies that take into account the children’s bio-psycho-motor particularities. This implementation can also increase the attractiveness of physical education and sports classes in traditional education.

We should accept the introduction of new alternative pedagogies without fear of failure. This leads to openness towards new means, methods and forms of conducting the physical education and sports lesson.

The use of Step-by-Step alternative pedagogies in the Step-by-Step physical education and sports lesson provides a modern system that enables students to quickly learn physical exercises. It also arouses the interest of children in understanding the appropriate execution of movements: correction of mistakes, development of intuition and stimulation of their own preparation process.

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References


DETERMINING THE CHANGE IN THE SPEED EXECUTION OF A FREE HIT IN KARATE

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Abstract. Karate do is a popular discipline in the world in which execution speed plays an essential role. Regarding the study of the movement kinetics, which was a subject of research found in many specialised materials, the interpretation of data having the same characteristic that coaches give up on such studies based on didactic experience in the correction of movements or by using trial-and-error approach. Still, that is not effective from the perspective of the economy of training hours. The paper aims to demonstrate whether the speed of execution of a hit can be modified depending on the final point of impact. So it was analysed the speed of execution of two technical procedures (Junzuki and Mae-Geri), with a free hit and a hit on a fixed point and compare the data for 13 subjects (male, aged 8-12 years). Data analysis was performed through the program SPSS version 21. In conclusion, there were no significant changes (p > 0.05) when the subjects perform the free hit and the hit on a fixed point.

Keywords: karate, speed execution, movement analyse.

Introduction

Karate do is a discipline that contributes permanently to the development of the individual, defined by Deliu (2008, p. 123) as a school of life, in which, respecting its principles, in physical and mental applications, can improve the spirit, thus realising the expansion of knowledge and enriching personality.

Analysing the components of karate training, we recognize that physical training is the basis of the whole activity, and it directly supports the technique of executing specific procedures.

In order to get top results in karate it is necessary to monitor the training process. Anthropometric features are an important factor for karate success, where the most important role for achieving top results is speed. (Scepanovic & Vlahovic, 2013). According to Sertic (2004), a hypothetical formula of success in the preparation of the karateka sport is JSK = 25% speed + 20% coordination + 18% strength + 15% flexibility + 12% precision + balance 10%.

In addition to historical, technical and methodological notions, there are studies that have used advanced technologies to study karateka athletes to monitor sports training. Thus, in Romania, a study was carried out to demonstrate the existence of stable aspects of movement (motion invariants) by using the MVN zbiomech-Xsens equipment in the kata (Ardelean, de Hillerin, & Bidiugan, 2014).

Many areas of modern life use motion analysis systems. Different analyses based on the capture of the human movement are now one of the most active research subjects. Increasing demands make it necessary to develop more and more advanced techniques for motion capture devices. The requirements for motion analysis systems in sport are completely different.

In recent years, some review papers on the possibilities of using motion analysis in sports have been published (Liebermann et al., 2002; Barris & Button, 2008; Wilson, 2008). Of these, there are no articles specifically discussing this issue in the martial arts.


There are currently many motion video software packages available for analytics with a wide range of features. Examples of free solutions are: Kinovea, SiliconCoach or SkillSpector (Polak et al., 2015). Video-based systems are often used in fighting sports and martial arts for scientific purposes. One of the research topics is the analysis of the time structure of sporting activities performed during the competition. Such an analysis was carried out in Muay Thai (Del Vecchio, Silva, & Farias, 2015), Muay Thai and kick-boxing (Silva et al., 2011), judo (Miarka et al., 2011), karate (Kautzner & Junior, 2012) or Taekwondo (Falco et al., 2012; Fereira et al., 2014).
Material and method

One of the recommended ways is to monitor the work and its outcomes as a starting point in setting up future action pathways. In this respect, we started from the premise that the monitoring of the preparation of a group of karateka athletes, the Wado Ryu style, by setting the level of manifestation of the motor qualities and identifying the imperfections manifested in the execution of some technical procedures, could provide conclusive data for the elaboration of some programs effective training.

The purpose of the research is to determine whether the speed of execution of a stroke can be influenced by the existence of a fixed point where the stroke is applied.

Assumption

The speed of execution of a hit is not influenced by the existence of a fixed point to which it applies.

The research was carried out over a period of 3 months and aimed at the realization of a longitudinal type experiment, developed in collaboration with the Grifonis Sports Club in Drobeta Turnu-Severin, led by sensei Dan Puicea, with the purpose to develop and implement some work programs that aimed to monitor the speed execution for the two most commonly used technical procedures in Kumite competitions plus four tests for explosive force and coordination speed assessment and a co-femoral mobility assessment test. In order to verify the validity of the execution speed data, considering the Wado-Ryu specific technique, two procedures were chosen, namely Juzuki and Mae-Geri recorded without a fixed point of stroke and with a fixed point of completion of the movement.

Motion analysis - this method aimed at using “Kinovea” (2019), a program that allows the analysis of an athlete's movement. The software was developed in France by the Kinovea Organization and allows a redefining of normal speed by 200%, and the fragmentation of the motion sequences can be achieved.

Kinovea is a video analysis software program dedicated to professionals in the field of Sports Science, coaches, athletes and medical professionals. Supported files are displayed and can easily save videos or can be accessed later. The movie can be viewed in slow motion, so images can be viewed by frame. Lines and arrows can be added to the image using the drawing tool (Elwardany, El-Sayed., & Ali, 2015).

The subjects of the research (n=13, male gender) were semi-advanced and advanced athletes from the Grifonis Wado Kai Sports Club in Drobeta Turnu-Severin, between the ages of 8 and 12, practicing karate for 6-36 months.

Results

Junzuki Junzuki cushion with pillow

Table 1. Output speeds in Junzuki with and without fixed point of impact

<table>
<thead>
<tr>
<th>Evaluation/Statistical parameter</th>
<th>Junzuki with pillow</th>
<th>Junzuki without pillow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.90</td>
<td>0.89</td>
</tr>
<tr>
<td>Statistical deviation</td>
<td>0.17</td>
<td>0.15</td>
</tr>
<tr>
<td>Min</td>
<td>0.55</td>
<td>0.60</td>
</tr>
<tr>
<td>Max</td>
<td>1.20</td>
<td>1.16</td>
</tr>
<tr>
<td>t-Test</td>
<td>0.507</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>0.62</td>
<td></td>
</tr>
</tbody>
</table>

In the Junzuki process with and without fixed point of impact, the execution speed recorded at a fixed point an average value of 0.90 (± 0.17 m/s), with values between 0.55 and 1.20 m/s, and without a fixed point of impact, the average value was 0.89 m/s, with minimum values of 0.60 m/s and the maximum of 1.16 m/s. Applying the t-Test between the averages of the two tests, a value of t = 0.507, the mean difference being not significant, the value of t being at a threshold of p > 0.05, which demonstrates that the data obtained from executions specific to the Wado-Ryu style can be taken into account, with the execution speed not recording significant changes. (Table 1, Figures 1 and 2)
Figure 1. Execution speed values in Junzuki without fixed point of impact

Figure 2. Junzuki fixed point of impact execution speed values

Table 2. Results of execution speed in Mae-Geri with and without fixed point of impact

<table>
<thead>
<tr>
<th>Evaluation/Statistical parameter</th>
<th>Mae-Geri with pillow</th>
<th>Mae-Geri without pillow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>2.09</td>
<td>2.08</td>
</tr>
<tr>
<td>Statistical deviation</td>
<td>0.27</td>
<td>0.18</td>
</tr>
<tr>
<td>Min</td>
<td>1.70</td>
<td>1.66</td>
</tr>
<tr>
<td>Max</td>
<td>2.29</td>
<td>2.29</td>
</tr>
<tr>
<td>T-test</td>
<td></td>
<td>0.536</td>
</tr>
<tr>
<td>P</td>
<td>0.602</td>
<td></td>
</tr>
</tbody>
</table>

In Mae-Geri with and without a fixed point of impact, the execution speed recorded an average point of 2.09 (± 0.27 m/s) at a fixed point with values ranging from 1.70 to 2.29 m/s. For non-fixed point execution, the average value was 2.08 m/s, with minimum values of 1.66 and maximum 2.29 m/s. Applying the t-Test between the averages of the two tests, a value of t = 0.536 was obtained, the difference in the mean being not significant, the value of t being within a threshold of p > 0.05, which demonstrates that between the executions with fixed points of impact and those without, the execution speed does not change. (Table 2)

Discussions

In other previous studies (Mikić, Huremovic, & Mehinovic, 2009; Doder et al., 2009), it is noted that the techniques and success of karate competition depend very much on the explosive force of the lower train and the speed execution of specific movements. Other scientific investigations using video analysis software have focused on the spatiotemporal characteristics of various techniques, such as karate strikes (Zvonar et al., 2012; Gianino, 2010). Motion analysis is used in martial arts as well to determine the risk and causes of wounds (Kochhar et al., 2005).

In the verification of the research methodology, we observed that there are no significant differences regarding the recorded speed of execution when the movement is completed without touching a fixed point of impact, a
technique specific to the Wado-Ryu style, or when it stops at a point of hitting. By recording the execution speed values in the Junzuki and Mae-Geri technical procedures executed with and without a training pill, the data obtained with the Kinovea motion analysis program revealed that there are no significant differences, which will support the validity of the values recorded. This confirms the hypothesis according to which “the speed of execution of a hit is not influenced by the existence of a fixed point to which it is applied”.

Conclusions

As a result, during training, the video-based system can be a useful tool in training, enabling qualitative and quantitative comparisons to allow a rapid visualization of the specific movement.

The system also provides accurate information about the spatiotemporal parameters of the movements performed by the athlete during competitions or training sessions. Such systems allow, for example to compare the speed of movement of the lower limbs in a particular strike, between athletes of different ages. This allows the tracking of changes occurring during impact movements in terms of common angles, such as in the knee or hip joint.

References


FOOTBALL-SPECIFIC MOTOR TRAINING PROGRAM ADAPTED TO CHILDREN WITH SEN AGED 16-18

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Abstract. By our scientific intervention we aimed to adapt and individualise the training in accordance with the requirements of the special needs, to use the optimal methods and means of developing the motor skills adapted to the objectives and requirements of each training period, to establish objective tests and examinations and to determine the level of development of the football game specific motor skills. The subjects of research are represented by 20 children (boys) with SEN, aged between 16 and 18 from the Gâvana Family-Type Centre, Pitești. Research methods used: study of literature, direct and indirect observation, talking to specialists in football and in adapted sports, recording of data obtained from tests and examinations, experiment, statistic-mathematical, graphical method. From the comparative analysis of the results of the four tests (initial - intermediate - final), we can see that significance is recorded in the range of tests 1-3 and 1-4, in the specific motricity. In the test Precision pass we can interpret that after processing the results between the initial and final tests there is a significant increase in the initial level with a significance of the 0.05 thresholds, which shows that during this period the content of the program proposed by us was highly efficient.

Keywords: football, children with SEN, adapted training, specific motricity tests.

Introduction

In order to provide a modern teaching and learning process based on an optimal educational offer and for the differentiated training of children with SEN in the football game on the basis of individual or group particular learning paths, it is required, according to the practical reality, to implement the children’s acquisition of the necessary knowledge, to act on general physical development, combined and coordinated motor skills, as well as the strengthening in practicing the adapted football game in order to turn them to advantage on an individual level by increasing self-esteem, trust, joining a group, family, improving the quality of life etc. According to Jinga and Negreț (1994), sports games are different from motion and preparatory games through more precise organization and deployment requirements. Due to its spectacular character, it mobilises a large number of participants and a large mass of spectators with outstanding educational effects. According to Ciolcă and Ciolcă (2008), one of the main purpose of the adapted football is increasing the possibilities of integration in the community of people with intellect affected, by collective, team games.

According to Renato (1996), sporting technique is a process or a set of procedures learned through the exercise in order to solve rationally and efficiently as possible a certain task based on movement (a motor problem). According to Motroc (1994), the acquisition of a skill bag, hobbies and action on the ball causes a higher demand of the sensory system, comparing the internal information with the external and verbal information, which favours the correct and economical learning of the football game technique. According to Motroc and Cojocaru (1991), it is appreciated that the preparation of children and adolescents does not represent the training of seniors on a small scale but is based on an original conception determined by the particularities of morphological, functional, motor and psychological development.

The purpose of our research was to experimentally draw up and implement the most effective didactic strategies to improve physical and psychological training through football adapted to institutionalised children aged 16-18 years, materialised in a specific training program of adapted football.

Objectives of the research

1. Engaging in the effort of the general muscles and specific to the technical-tactical gestures specific to the football game;
2. General training for the effort but also specifies the engagement and support of the specific game effort;
3. Developing the precision of long passing of experimental subjects.

Hypothesis of the research

By using the adapted football-specific motor skill program for institutionalised children aged 16-18 years we can determine a development of the precision of long passing of experimental subjects.
Material and methods

Research methods used: study of literature, direct and indirect observation, talking to specialists in football and in adapted sports, recording of data obtained from tests and examinations, experiment, statistic-mathematical and graphical method.

Participants

The subjects of the exploratory research are represented by 20 children (boys) with SEN, aged 16-18 from the Family-Type Găvana Centre, Piteşti. Our subjects are under the permanent observation of a psychologist. Together with him, we tested the level of psycho-motor skills of the subjects and we obtained the following results: normal physical development, an IQ between 60 and 110, need of attachment and family environment, social rejection.

Procedure

The context of the research is represented by The Family-Type Piteşti Centre, located in Piteşti, a family-type child protection service designed to provide the protection, upbringing and care of the child temporarily or permanently separated from its parents as a result of establishing, under the law, of the placement measure. The periodic preparation of children with SEN, aged 16-18, is spread over the school year 2017-2018. In adapted football, it is important, when doing the periodization, for the teacher to be more concerned about establishing a physiological response or about adaptation to effort leading to the greatest improvement, rather than being concerned about what kind of exercises or skills will be practiced within a certain physical education class. Our training program envisaged the staging of the content of the training process over one period of training. We excluded the precompetitive and competitive period and the restoration of effort capacity, as we do not have a football championship in which to participate. We have developed several planning documents, including: the annual training plan (macro-cycle); stage preparation plan (mid-cycle), weekly cycle preparation plan (micro-cycle) (Pătrășcan & Ștefănică, 2017).

Table 1. Pattern – Schedule of the annual training plan for the experimental group 2017-2018

<table>
<thead>
<tr>
<th>Date</th>
<th>Months</th>
<th>September</th>
<th>...</th>
<th>December</th>
<th>...</th>
<th>March</th>
<th>June</th>
</tr>
</thead>
<tbody>
<tr>
<td>weeks</td>
<td>4</td>
<td>11</td>
<td>...</td>
<td>6</td>
<td>13</td>
<td>...</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Periodization</th>
<th>The PREPARATORY Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microcycle</td>
<td>1</td>
</tr>
<tr>
<td>Training days</td>
<td>3</td>
</tr>
<tr>
<td>No. of trainings</td>
<td>3</td>
</tr>
<tr>
<td>Hours of training</td>
<td>6</td>
</tr>
<tr>
<td>Physical general</td>
<td>1.8</td>
</tr>
<tr>
<td>Physical specific</td>
<td>1.8</td>
</tr>
<tr>
<td>Technical</td>
<td>0.8</td>
</tr>
<tr>
<td>Tactical</td>
<td>0.4</td>
</tr>
<tr>
<td>Psychological</td>
<td>0.7</td>
</tr>
<tr>
<td>Theoretical training</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Tests: X, ..., X, ..., X, ..., X

We performed four tests - the initial test, two intermediary tests and a final test, as shown in Table 1. Following the implementation of the specific motor skill program, over the period September 2017 and June 2018 we obtained more or less significant changes, shown in the Results box.

Examples from pass precision development program:
• No. 1. The players are arranged on three rows 1, 2, 3 on half of the field as a deployment space area with goal defended by an active goalkeeper, attack structure of 16 m will be triggered by balls thrown by the coach from the side, after the coach calls the number to be assigned as the attacking midfielder; initially the execution will be performed with only one active opponent who will sprint from the corner of the 16 m box, when the ball is taken by the attacking midfielder (Figure 1). This time it will trigger the parallel departure of two attacking midfielders by making a common block with the goalkeeper; as a possibility, the coaches will throw the balls at a turn also to the players will sprint from the corners of the 16 m box.

Specific dosing: The 4-6 X execution will be repeated with a semi-active pause, while the continuous control of the ball by footwork and slight running followed by stretching while sitting on the lawn or on the rug will be exercised.

![Figure 1. Graphical representation of the first drive tool](image1)

• No. 2. In the same way as the attacking structure mentioned above, except this time it will be a struggle to win the ball between the two players who will sprint from the corners of the 16 m box and the one who wins his possession inside the 10 m box for 40 seconds, will decisively pass for the third placed outside the box by leaving from the right/left side of the box, which will only finish with a shot from outside the box (Figure 2). As an execution variant, the number of players who will sprint on teams of 2 or 3, which will give the fight to win the possession inside the box for the player from the outside who will finish with a shot, can be supplemented.

Specific dosing: The 8-10 X execution will be repeated with a semi-active pause, while the continuous control of the ball by footwork and slight running followed by stretching while sitting on the lawn or on the rug will be exercised.

![Figure 2. Graphical representation of the second drive tool](image2)

• No. 3. The players will be arranged on a square-shaped space with the sides of 15 m, being arranged on the corners of the box and close to its sides, inside the space 5 against 2 players belonging to the blue team, of those in the big square positioned in a 8-by-8 m-area (Figure 3). The games will take the form of winning possession as follows: In the small square games will be played with 5 players with red
equipment against 2 players in blue equipment - ball possession will be gained at the simple touch; the whistle of the coach will trigger the games in the first phase; if the ball is touched by the blue team, they will pass outside the small square with the whole blue team without leaving the central area.

![Image](image_url)

Figure 3. Graphical representation of the third drive tool

Specific dosing: The 2-4 X half-time execution will be repeated with a semi-active pause, while the continuous control of the ball by footwork and slight running followed by stretching while sitting on the lawn or on the rug will be exercised.

For the evaluation of the precision capacity, we used the Ball passing with precision at 9 m, assessing the level of training and the progress of the group under investigation according to the means applied in the preparation. We present the results obtained in Table 2 and Figure 4.

- Ball passing with precision at 9 m:
  Description: On the 9-meter line, 10 balls are placed in line at a distance of 50 cm from each other, the player will hit the balls consecutively, but not before making the judging after each hit ball. The ball is at the ground and must score without touching the ground before the goal line. Each player is entitled to 10 continuous run attempts.
  Appreciation: On a scale from 1 to 10, the following assessments were made:
  9-10 accurate = very good;
  7-8 accurate = good;
  6 accurate = medium;
  5 accurate = satisfactory;
  4 accurate = unsatisfactory.
  By comparing the arithmetic mean of the four situations, it is found that the average of the first test is lower than the fourth test, while the difference between the fourth test and the initial test is 3.4.

Results

Table 2. Analysis of statistical indicators for the test – Ball passing with precision

<table>
<thead>
<tr>
<th></th>
<th>Testing 1</th>
<th>Testing 2</th>
<th>Testing 3</th>
<th>Testing 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>3.6</td>
<td>5.45</td>
<td>6.85</td>
<td>7</td>
</tr>
<tr>
<td>S</td>
<td>1.29</td>
<td>1.21</td>
<td>0.86</td>
<td>0.87</td>
</tr>
<tr>
<td>CV</td>
<td>36.02</td>
<td>22.35</td>
<td>12.61</td>
<td>12.52</td>
</tr>
<tr>
<td>Comparative analysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statistical indicators</td>
<td>T 1-2</td>
<td>T 1-3</td>
<td>T 1-4</td>
<td></td>
</tr>
<tr>
<td>Difference of averages</td>
<td>1.85</td>
<td>3.25</td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td>Average error</td>
<td>0.03</td>
<td>0.02</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>Critical t</td>
<td>2.09</td>
<td>2.09</td>
<td>2.09</td>
<td></td>
</tr>
<tr>
<td>Calculated t</td>
<td>7.11</td>
<td>13.54</td>
<td>14.16</td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td></td>
</tr>
</tbody>
</table>
In the precision pass test we can interpret that after the processing of the results between the first two tests, the difference in the averages indicates a significant increase of the results, the calculated $t$ having a value of 7.11 units, superior to the critical $t$ for the threshold of 0.05 set by us (Figure 4). This fact may be due to the content of the programs proposed by us that targeted this parameter prevalently in the first part of the proposed programs. It can be noticed, however, that between tests 1-3 and 1-4 there is a significant increase of the initial level with a significance of the recorded thresholds of 0.05, which shows that during this period the content of the programs proposed by us had an efficiency at least as high as the first period.

All this evolution of the results recorded in this testing can indicate that regardless of the training period undergone, it is useful to monitor and develop it by specific means and appropriate dosage, which was found in our experiment in the content of the proposed training programs.

The evolution of significance during the periods tested by us can be presented also from the perspective of the graph, showing us the $t$-value calculated by us and the critical $t$-value that we find in the Fischer’s table at the threshold of 0.05.

![Graph showing the comparative value of the test - passing the ball with precision](image)

**Figure 4.** Analysis of statistical indicators for the test – Passing the ball with precision

**Conclusions**

The hypothesis which states that by using the specific motor skill program with means from football adapted to children with SEN aged 16-18 may lead to an increase in the accuracy of the pass of the experimental subjects, is proved with the arguments below.

In the precision pass - test we can interpret that after processing the results between the initial and final tests there is a significant increase in the initial level with a significance of the 0.05 thresholds, which shows that during this period the content of the program proposed by us was highly efficient.

Through the changes presented above, we have demonstrated that our program is a plus in improving the lives of children with special educational needs aged 16-18 and at the same time the working hypotheses of our experimental research have been confirmed.

The law applicable to Romanian special education programs delineates the institutional framework well, but needs to be supplemented in the form of amendments allowing better management of resources. The creation of a legally binding framework of action to ensure access to education for all children through formal education and educational services for children with special educational needs enrolled in both special education and mass education, as well as the staff involved in their education represents the vision our special education.

Curricular didactic design at the level of special education for the extra-curricular activity of the sporting environment contributes in a more pragmatic and efficient way to achieving the educational ideal and goals at global and operational level. Beginning in a sports or leisure activity in children with special needs should be generated starting with preschool and small school children (primary cycle) and designing attractive and useful content in real life.
References


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- Institutional affiliation, address, city, country
- Corresponding author (e-mail address)

Examples:

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**Examples:**

- According to Suchilin (2010), the biomechanical criteria are used for dividing the gymnastics elements into parts (p. 5).

- The Publication Manual of the American Psychological Association was first published in 1929 as a seven-page standard of procedure (Bentley et al., 1929, p. 57).

Check each source cited to appear in both the body text and the reference list, while the author and the year are to be identified in terms of spelling. The list of references at the end of the scientific article provides information needed to identify each source. It will mention: **author(s), year, title, city, publisher, pages,** depending on the source of citation (book, journal article, website).

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**For citing a journal article**


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