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The Impact of Physical Exercise on Motor Education to Pupils

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Abstract

Introduction: Physical exercise, as an application of body exercises, is an adapted process, which during the application of movement activities causes changes in human abilities, from the initial ones to the desired ones. Physical exercise is an adapted, thought-out and organized process with the application of certain exercises and methods, which cause changes in the exerciser's physical condition. **The purpose of this paper** review is to analyze the literature and understand every movement or every physical activity that in a correct and harmonious manner with legalities, is carried out for the achievement of concrete actions of physical education. In fact, it has an important impact on physical exercise is: - creation of certain skills and habits; - development and improvement of movement and functional skills; - satisfaction of personality needs (creative, recreational and human needs, entertainment needs). **Methodology:** In order to fulfill this review are using methods of literature analysis, and is made combination and comparison of data from various works of authors varied. To successfully realize this review paper we studied and analyzed the contemporary scientific literature. The methods used are: literature analysis, physical activity and recommendations. **Recommendations:** In the literature used, one can clearly see the importance of understanding that, the higher quality level of pupil movement culture, the higher level of mastery of teaching tasks and the higher level of movement skills education.

Keywords: motor skills, movement, recreational needs, pupils, amplitude.

Introduction

CONCEPT ON PHYSICAL EXERCISE

There are many definitions that clarify the concept of physical exercise. In the following, we are presenting some of them, with the aim that pupils and teachers act in an operative manner. Physical exercise (physical exercise) is the thought and guided movement activity, with the aim of positive transformation of human abilities, from concrete ones to desired ones. Physical exercise is the basic tool and method of physical education of pupils, a special chosen movement activity, which is first of all is:

- a-** Optimum achievement of the level of motor skills (biological purpose);
- b-** Achieving motor training through the formation of the perfection of movement skills and habits (pedagogical goal) (*Adriana G et al., 2020*).

By physical exercise we mean any movement or any physical activity, which is performed correctly and in harmony with the laws, to achieve the concrete goals of physical education. Physical exercise is a motor form, movement and system of movements, with the application of which, at a given time, the process of physical exercise is formed. Physical exercise is an adapted process, which is achieved through systematic repetitions of exercises.

The basic purpose of physical exercise can be:

- Creation of certain skills and habits;
- Development and improvement of motor and functional skills;
- Satisfaction of personality needs (creative, recreational and human needs, entertainment needs) (*Arem H et al., 2015*).

Physical exercise as an application of body exercises, is an adapted process, with which during the application of movement activities (or through systematic ways of repetitions and physical exercises) cause changes in human abilities, from the initial ones to the desired ones. Physical training exercise is an adapted, thought-out and organized process with the application of certain exercises and methods, which cause changes from the current state to the desired one (*Hearing M et al., 2016*).

The process of physical exercise can be shown in this way:

$S_0 + V \cdot D = S_1$ Where,

S_0 -indicates the current state (growth, health, motor skills, exercise results, motivation, creative abilities, etc.);

V - indicates suitable operators and physical exercises;

D - indicates dosage (number of repetitions, intensity and duration);

S1-indicates the product of the exercises or the achievement of the specific goal (*Schuch B et al., 2016*).

Every movement activity is composed of certain number of movements, but not every movement is considered physical exercise. In physical education, in sports and recreation, by exercises we understand only the selected movements, with which consciousness is regulated.

The selected (desired) movements have the following characteristics:

- Appear as a result of knowledge;
- Continue as a result of the learning experience;
- Learning movements is a function of human desires (*Guthold R et al., 2019*).

The impact of physical exercises is intentional and never accidental, as happens in certain movement actions, where the impact of physical exercises is more or less pronounced. Thus, the force of cutting wood in the forest is a consequence of natural work, with which material existence is created. Some work activities can have a positive impact on the psychosomatic status of the individual, but even that impact is slow. On the other hand, lifting weights in physical education is a chosen activity, with which it is desired to improve the strength of the muscles, to form their beautiful appearance, to achieve the desired results of the exercises, etc.

Physical exercise in physical education performs two basic tasks:

- 1- By repeating the exercises, to perfect or strengthen the movement technique (form of movement);
- 2- To have an impact on organs and functional systems of the organism, in order to obtain certain changes (*Wen X., 2015*).

Kinematic structure of physical exercises

Physical exercise has spatial, temporal and spatial-temporal characteristics. The spatial characteristics of the exercise include: - the position of the body of the exerciser and the amplitude of the movements (direction, shape and volume of the amplitude).

Body position - certain relations of the body and its parts with external objects. Before executing any exercise, where the body and its parts are transferred, it must be taken into

account beforehand that each movement begins and ends with apparent precision (initial and final position or stance).

The initial position or stance is important, because in most cases it plays a decisive role in the development and efficiency of the movement. The initial position or stance affects the direction, speed and force of the movement. The starting position or stance is an integral part of the movement technique (low start, rope pulling stance, etc.). The initial position or stance is not only seen as a form, but also as a special psychological activity of the person performing the movement. In it, first of all, concentration, attention and mobilization of skills are present, which are quite important for performing movements.

The positions of the exerciser are also very important in movement (cycling, skiing, swimming), where with their help, greater efficiency is possible, as a result of reducing the resistance of air, snow, water. In some sports (jumping, figure skating, dancing, rhythmic gymnastics), the starting position has its great role in the aesthetic side.

The final position or stance has a great role, because it gives us the information about what dimensions and parameters, with what measures the motor form and the tasks were carried out. Based on the final position, impressions can be created and new instructions can be given for the correct execution of movements in future exercises. In teaching physical education, it is important to ask the exerciser to emphasize the final position himself, as this directly and efficiently affects the learning of the movement (*Nizhnikovski T et al., 2013*).

The path of movement is characterized by direction, distance and shape.

Direction is the orientation of the movement (determination of movement) of the body or its parts in space. Executions of lifts and bends of the head are possible, if there is a transfer of momentum from the lower extremities of the body, before opening at a certain angle, in relation to the support. Throwing the sphere is efficient, if it is performed after a movement from a certain angle. At the start for swimming, the bending of the body and breaking away from the certain angle affect successful swimming and the feeling of the depth in the water and the start of swimming, etc.

Each movement, depending on the anatomical-mechanical possibilities of the movement itself in the joints, can be performed in many directions. From the direction of the movement of the foot before the shot, it depends on what level the contact with the ball will be and therefore,

what level the speed of the ball movement and precision will be (*Potop VA & Grad R & Boloban VN., 2013*).

The volume, the size or rather the amplitude of the beginning of the movement, indicates the extent or limit of displacement of the body and its parts from one position to the last position. We can determine the volume of movement through the degree of countermovement, by measuring distance or height (jumps, momentum distance, step length, etc.) (*Sadovski E et al., 2012*).

The amplitude of the movement depends on the mobility of the joints, on the quality of the muscles and their connections, on the harmonization of the work of the agonistic and antagonistic muscles, on the cooperation of the synergistic muscles, on the structure of the exercises and on the tasks to be achieved.

According to its path, the movement can be *rectilinear* and arc. Rectilinear movements in humans are almost non-existent (although running and swimming are considered so-called rectilinear movements), and even short rectilinear movements (kicks in karate or boxing) occur in arcs. The sequence of movement is determined by neuromuscular coordination as well as by the mass of the moving body (*Garnacho M V et al., 2015*).

Regarding its extension, the movement is defined as the time distance between the initial position and the final one of the exercise, between the beginning and the end of the movement. The duration of the exercise is related to the time of movement of the body or its parts from the place. We can talk about the existence of several phases of movements, especially cyclical movements. Knowing the duration of the exercise is very important for determining the exercise load as well as for planning the exercises during the physical education and training class.

The rhythm of the exercise is a time characteristic, by which we must understand the frequency of movements in a given time. In physical education and sports, care is always taken in the rhythm of running, walking, swimming, in the execution and combination of gymnastic exercises, etc.

The tempo of the exercise is very significant. The end, the result of the exercise depends on the tempo, but also the level of the load in the training (*Venturelli F & Schena & Richardson R S., 2012*).

Spatial and temporal characteristics of physical exercise can be highlighted through the analysis of movement speed. Speed is the distance traveled in a given time. If the speed of a

movement from one point to another, in the entire path of movement, does not change, we say that we are dealing with uniform movement. If the speed of the movement changes during the movement, we say that we are dealing with non-uniform movement. The speed of individual movements and that of the whole body, the speed of displacement of the body in space and that of the movement of separate parts of the body, are often different. Movements can be at maximum speed, fast, medium speed, slow and very slow.

The speed of all movements is related to concrete movements or concrete exercises. In training, it is important to distinguish between maximum and optimal speed. In some sports disciplines and physical exercises, it is required to perform movements at maximum speed (sprinting, punching in boxing, momentum in the long jump, etc.); there are other disciplines, in which movements are required to be performed at optimal speed (rhythmic gymnastics, artistic gymnastics, figure skating-skating, momentum in high jump, etc.) (*Sánchez L et al., 2014*).

The dynamic structure of physical exercises

The technique, the kinematic structure of physical exercises are determined by their dynamic characteristics, which are conditioned by the action of muscular forces. Every physical exercise is performed by activating the muscles that produce muscular strength, but external forces also affect the movement. All forces that have an impact on movement are divided into *internal forces and external forces*.

Internal forces include:

- Active muscle forces;
- Passive joint forces (elasticity of ligaments and tendons);
- Reactive forces, which influence the harmonization of body movements with the movements of individual parts (moving with acceleration).

External forces include:

- Body weight;
- Reactive forces of supports and hangers;
- Physical forces of external bodies (objects) (adversary, weight of tools and equipment, inertial forces of tools, the body on which the person relies, etc.) and the environment.

External forces in most cases are load forces. In addition to muscular forces, inertial forces or any other external force can be used to perform work and to overcome any load, which significantly consumes reserve energy forces. Man is forced to perfect the movements and in them to reduce the participation of active muscle forces, as a result of increasing the action of external forces (*Keller K & Engelhardt M., 2013*).

The rhythmic structure of physical exercises

In complex movements, rhythmic data also play an important role. The rhythm of the movement is about the periodic execution of the movements. In contrast to the tempo, the rhythm of the movement varies in:

- The presentation or non-presentation of the part of the movement or the movement in totality;
- Submission to certain standards of time intervals.

Emphasized parts of the movement occur under the influence of the active force of the muscles, in order to then follow (cause) the movement according to inertia, for the unaccented part of the movement. The economy and efficiency of movement depends to a certain extent on the rhythm of movement. For physical exercises, apart from the kinematic, dynamic and rhythmic characteristics, it is necessary to take into account the quality characteristics of the movement (*Donnelly J E et al., 2016*).

Quality characteristics of physical exercises

The qualitative characteristics of physical exercises are indicators of the way of performing the movements, which show to what extent the technique of the movements, for their identity with the requirements and the required form. Qualitative characteristics are also indicative of the level of temporal and spatial parameters of movements. Movements can be:

- Correct;
- Economic;
- Energetic;
- Harmonic;
- Elastic.

The accuracy of the movements has to do with their intentional harmonization (shooting at the goal, rolling the ball, etc.) or with giving the shape of the movements in advance (jumping in the water, artistic sliding, etc.).

The economization of movements can be achieved by coordinating the participating actions, in which there should be no unnecessary load or excessive actions, which means that energy is spent in the required amount.

Harmonic movements are about performing them in a fluid manner, where the load and release of the muscles, the acceleration and deceleration of the movements are aligned directly and harmoniously (movements in rhythmic gymnastics, acrobatics, skating, etc.).

The elasticity and mobility of the movements can be seen in the cases where their amortization is done in the different phases (falls on the floor, meeting the ground in jumps, jumps roll, catching and stopping the ball, etc.).

The aforementioned characteristics of physical exercises speak for the quality of execution, for the level of acquisition of the exercise technique. The quality of technique is a matter of learning and practicing, including sports competitions. The quality characteristics of physical exercises are influenced by the nature of the exercise itself, but also by the individual qualities of the exerciser (*Pesce C., 2012*).

Systems of physical exercises

Various physical exercises are used in physical education, sports and recreation. In order to be used with clear orientations and goals, completing their number, but also the learning process of students, children, youth, people and specialists in the field of physical education and sports, it is extremely important that physical exercises are organized according to certain criteria. Their classification into groups is done according to some common criteria.

According to the anatomical criteria, physical exercises are divided into exercises for the neck, arms, trunk, legs and exercises for the whole body.

According to the use of tools, physical exercises are divided into exercises on tools, exercises with tools and exercises without tools. Physical exercises can be with or without the use of assistive devices.

In general relation to keeping or not keeping the pose, standing position, physical exercises are divided into exercises in place and exercises in movement.

Such and similar divisions of physical exercises are numerous, since the criterion of their systematization does not come from the essence of the character, but from other superficial data (*Best J R., 2010*).

Based on the form of movement, physical exercises are divided into four main groups:

- Exercises without tools and without the help and resistance of others;
- Exercises on tools and with their help;
- Joint exercises;
- Combat exercises, which overcome the resistance of external forces.

Based on pedagogical principles, physical exercises have been systematized, dividing them into three groups:

- Exercises that affect discipline and education, in a general sense (exercises for keeping the body straight, etc.);
- Systematic exercises for the formation of muscles and joints (corrective exercises),
- Exercises for the development of mobility and motor coordination (balance exercises, exercises that develop strength, endurance and determination, such as: walking, running, jumping, mobility exercises, games and sports) (*Daci J et al., 2016*).

With the development of science on physical exercises and sports training, other systems have been made, based on physiological, biomechanical and psychological principles. Considering them not only as movement actions, but also as a method, based on these principles, physical exercises are divided into:

- Strength exercises;
- Speed exercises;
- Endurance exercises;
- Flexibility exercises;
- Skill exercises (*Brand R Ekkakakis P., 2018*).

Subashi G., 2006 divided physical exercises as follows:

- Auxiliary exercises (formation exercises), which are presented as mobility with analytical-isolating and relative-standard actions;

- Basic or elementary exercises (throws, lifts, pulls and catches) and locomotor exercises (running, swimming, jumping, etc.).
- Exercises of technical use or adapted exercises, which are characterized by movement elements that are technically selected and motivated. Dance exercises, as artistic forms of movements, which we can frame in this group, are characterized by the difficulty of expressing the emotional state of the exerciser himself and the state of others in a certain rhythm (*Subashi G., 2006*).

Pesce C. et al., based on their use in sports, made a systematization of physical exercises, as follows:

- Exercises for general physical preparation (used for the general functional development of the athlete);
- Auxiliary exercises (used in order to create the bases and later the perfect bases for sports disciplines.
- Exercises for special preparation, which have a central place especially in sports training and include movement actions, which in themselves contain elements or, according to the superficial character of functional actions, are similar to competition activities;
- Competition exercises (movement actions, which make up the structure and content of sports specialization) (*Pesce C et al., 2019*).

Wilson M. & Bengoechea E., have classified the movements, relying on the physiological criteria. Based on authors, we divide the physical exercises:

According to the basic stance in which the participating movements are performed:

- Exercises that are performed in the frontal or dorsal position (swimming-shooting);
- Exercises that are performed in a sitting position (horse riding, cycling, motorcycling, rowing);
- Exercises performed while standing with open legs (shooting, weightlifting, combat sports);
- Exercises performed while standing with legs together (standing upright, standing still);

- Exercises performed while standing with the feet in a line (exercises on the balance beam, on the gymnastic bench or on other limited surfaces).
- Exercises performed while standing on one leg on tiptoes (artistic gymnastics, rhythmic gymnastics, aerobic gymnastics, rhythmic dance, etc.);
- Exercises performed while standing on skates (figure skating);
- Exercises that are performed in support or hanging (grabs, hanging, support on the forearm, support on the hands, support on one hand, on the head and hands, etc.) (*Wilson M & Bengoechea E., 2010*).

Participatory and characteristic movement actions of physical exercises can be:

- Stereotyped motor actions (standardized);
- Situational motor actions (not standardized).

Stereotyped movement actions, starting from the forms and ways of performing them, are measured quantitatively (cm, m, km, sec, min, hour, etc.) and with qualitative values (point, grade). According to the intensity, the movement actions (whether cyclic or acyclic), are: movement actions with maximal, submaximal, average, sub average and low intensity. Movement actions are also divided according to the links participating in them. Thus, in many of them, the participation of the legs is essential (walking, running, sliding, pedaling a bicycle), while in many others, the participation of the hands is essential (swimming, sailing, exercises with and on tools, etc.).

Stereotyped motor actions can be: fast and strong (jumps, powerful throws), weight lifting and precision (shooting, passing in sports games, target shooting).

Stereotyped movement actions that have qualitative values in execution, are divided according to types of sport and according to movement characteristics. According to the type of sport, they are: gymnastic movements, acrobatic movements, artistic slides, water jumps, ski jumps, etc.

According to movement characteristics, we mention: artistic gymnastics, acrobatics (requiring strength, speed, coordination, orientation in space and differentiation in time), figure skating, water jumps, ski jumping (requiring balance, flexibility, expressiveness).

Situational (non-standard) movement actions include: combat sports (wrestling, boxing, karate, judo, etc.), sports games (badminton, tennis, volleyball, handball, basketball, football,

field hockey, ice hockey, etc.)), cross-country (running, cross-country skiing, downhill, motocross, cross-country cycling, etc.) (*Mitchell J H et al., 1994*).

Purpose of the paper

Review is to analyze the literature and understand every movement or every physical activity that in a correct and harmonious manner with legalities, is carried out for the achievement of concrete actions of physical education. In fact, it has an important impact on physical exercise is: - creation of certain skills and habits; - development and improvement of movement and functional skills; - satisfaction of personality needs (creative, recreational and human needs, entertainment needs).

Methodology

In order to fulfill this review are using methods of literature analysis, and is made combination and comparison of data from various works of authors varied. To successfully realize this review paper we studied and analyzed the contemporary scientific literature. The methods used are: literature analysis, physical activity and recommendations.

Recommendations

The research in this paper brings the following recommendations:

- The process of physical education is at the same time a process of recognizing the variety of movement actions and physical exercises, with which children, students and young people can exercise with their choice and determination and based on the skills they possess. Knowing their types allows teachers and specialists of physical education and sports a successful creativity (*Mooses K et al., 2017*).
- The defining role in the education of pupils with motor skills and habits is played by the teacher, who must know at a high level the meaning and content of the movement phenomenon.
- Disciplines such as gymnastics, athletics, movement games and dance play an even greater role in the education of movement habits.

- The implementation of the physical education program requires the increase of the mobility baggage of the pupils and together with the characteristics and their executive features make up the meaning of mobility culture.
- The higher the quality level of the movement culture of the pupils, the higher the level of mastery of teaching tasks in the education of movement skills and the higher the level of predispositions for any sports discipline desired by them.
- The physical education teacher plays the essential role for an organic connection of the phenomena of movement culture in function of each other.
- In order for the teaching process in the subject of physical education to have an even greater impact on the quality education of physical movement habits, must be reviewed the planning processes of the programming of this subject, as well as the teaching methods.

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