

## The Ability to Correct a Persons Posture with Regular Exercise

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### ABSTRACT

Exercise has always been regarded as a powerful stimulant of physiological processes in the human body. It has been observed that physical exercise can have a positive influence on the posture of people of all ages. The available data are scattered and further development of research in this area was in need of synthesis and interpretation. To resolve this situation was carried out the present study, material for which was 34 sources. The methods used in the work were the bibliographic search method, the dialectical method and the synthesis method. With their help, the generalization, the comprehension and processing of the available information about the recreational opportunities of regular physical activity in relation to posture. It was found that systematic and graduated physical exercise always strengthens the back muscles, improve their tone and improve blood circulation in them. This gives grounds to consider them an affordable and effective way of correction and prevention of violations of posture. The main condition of success in this matter is the need for individual selection of physical exercises. Achieved through regular exercise correction of posture is due to the physiological load transfer on different parts of the spine, straightening it and election training the muscles of the body. Due to existing violations of the first stop progressing and then weaken, and then disappear. Achieved the positive effect of regular physical exercises is possible in the case of their conduct, providing simultaneous occurrence of positive changes in many body systems. Of particular importance here is the optimization of parameters of blood and nervous system. Apparently, the dynamics of these systems in the future can consider as the marker of success of the beginning of the application of physical loads, including posture correction.

**KEY WORDS:** POSTURE, SPINE, MUSCLE ACTIVITY, PHYSICAL ACTIVITY, HEALTH.

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## INTRODUCTION

Posture is a comprehensive indicator of the functional state of the body (Vasileva, 2016). Its disorders are formed under the influence of various mechanisms and often indicate the appearance of serious distress in the body. The elimination of these causes is the basis for the effective correction of posture and the prevention of its deterioration in the future (Boldov et al., 2018; Vatnikov et al., 2019).

It is recognized that such effects should be primarily aimed at the systematic strengthening of the muscles of the trunk and improving the functioning of the cardiovascular and respiratory systems (Bikbulatova, 2018a). It is also possible to achieve a beautiful posture with the help of a systematic recovery of the internal organs and spine. Improving physical culture, which significantly strengthens the muscles of the back, is considered very effective in this regard (Epifanov and Epifanov, 2008; Medvedev and Gamolina, 2008). At present, sports and fitness technologies have been seriously improved. They have become very high-tech due to the fact that they incorporate the results of many scientific studies of fitness and health (Krutsevich, 2003; Medvedev and Kumova, 2007b).

In recent years, various options for new exercises have been widely introduced into the practice of health-improving physical education, often with the use of weights that allow you to purposefully act on a separate organ and functional system. The special value of such exercises is that by applying various exercises, they can be dosed according to the strength, pace and amplitude of movements. They are able to develop muscle strength and endurance, develop joints and eliminate the effects of physical inactivity. Often, such exercises are performed on simulators, which allows you to impact on specific muscle groups and joints. The high efficiency of such exercises requires the continuation of their improvement to increase the degree of directed influence on the necessary parts of the spine, (Kashuba, 2003). Purpose of the present was to consider the main effective options for physical exercises that can affect the state of posture.

## MATERIAL AND METHODS

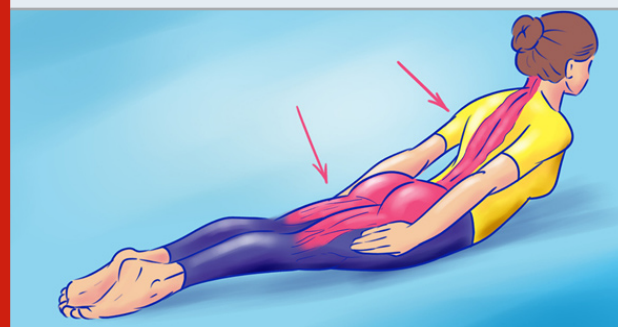
To collect data on the study topic were searched in data bases Web of Science and Scopus. Material for this study was 34 literature sources given in the bibliography. As methods the studies used a number of methods. Method bibliographic search - method of searching information sources (documents and publications), which have or may contain the desired information. The use of the method to ensure the quality of the work, as he allowed at the optimum time to obtain all the necessary information in the traditional information environment. This method was necessary for the authors to collect adequate information in modern conditions the rapid growth of the information environment of research and development.

The dialectical method is a method associated with the divergence and convergence of the whole and parts, main and secondary, essential and accidental, of statics and dynamics, abstract and concrete. The use of the dialectical method helped the authors of any phenomenon is to consider the duality of its properties and characteristics, to find their contradictions and the relationship (causality, unity, dependence). With it the properties of any phenomena splits into opposites and brought to researchers in the form of General and special quality and quantity, cause and effect, content and form. Synthesis method-theoretical-empirical method. He helped the authors to connect previously isolated parts of the object together. The connection of the results of the studies previously published works to a single system to form the most complete picture on the available scientific information. Using these methods the authors conducted a synthesis, interpretation and processing of available information, the results of which are posted in the articles section "Results and discussion".

## RESULTS AND DISCUSSION

It becomes clear that systematic and dosed physical culture exercises strengthen the muscular system and therefore are the best way to prevent postural disorders. The elimination of posture disorders is a necessary condition for primary and secondary prevention of orthopedic diseases and diseases of internal organs (Karpov et al., 2018). In vivo motor activity is a combination of static and dynamic work, which is carried out against the background of tonic muscle tension, and the elements of movement create the necessary stretching and contraction (Bespalov et al., 2018b). These effects, occurring in a coordinated manner, provide a normal motor act (Medvedev and Kumova, 2007a; Stepanova et al., 2018).

Figure 1: Doing a stretching exercise to help optimize posture



Feasible muscle activity is a natural means of physiological stimulation of the body. She maintains and improves dozens of adaptive mechanisms at all levels of functioning. The work performed by the muscles is determined by the dynamics of their traction and length. Well-known types of muscle work (overcoming, inferior, holding) are determined only by the direction of change in muscle length: shortening, lengthening, maintaining length. For these three types of work (the first two are dynamic, the last is static) there is the possibility of

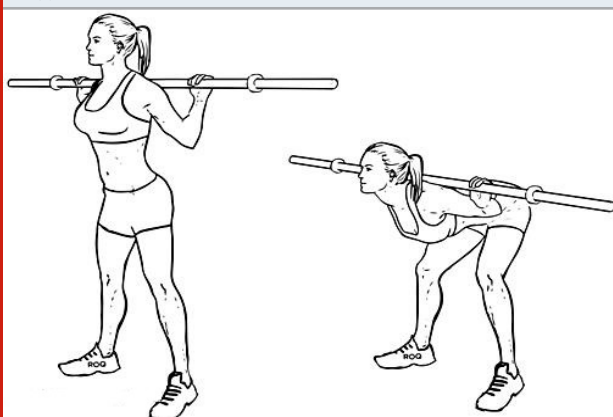
three options for changing the muscle traction force compared to the isometric one: its increase, decrease and maintenance without changes (Makhov and Medvedev, 2018c).

The use of stretching exercises contributes to the morphological restructuring and improvement of the elastic properties of pathologically altered tissues that limit the amplitude of movements or cause deformation (Figure 1) (Makhov and Medvedev, 2018a). The essence of the use of strength exercises for health purposes is to use the micropump function of skeletal muscles, which, when contracting, squeeze blood into the vessels, and when relaxing, they attract it, that is, they perform the function of the so-called "peripheral hearts" (Makhov and Medvedev, 2018b).

It is known that skeletal muscles have elastic and elastic properties, significantly contributing to the stretching and contraction of the muscle in vivo (Mal et al., 2018). However, muscle elasticity is imperfect. At the beginning of the stretching, the muscle exerts insignificant resistance to the tensile force, with further stretching, the muscle resistance of the tensile force grows. The non-linearity of muscle tension depends on the fact that in the muscle some sections are contracted, while others that are still at rest are stretched. The optimum of this process is capable of forming psychological comfort in a person (Bikbulatova, 2018b).

During exercise, the mechanical action of the muscles appears as a pull applied to the place of their attachment. The main condition determining the physiological effect of muscle traction is the load. Without a load for a muscle, there cannot be its tension and there cannot be its traction. It was noted that if a muscle is stretched repeatedly at short intervals of time, then its length increases more than with a single stretch (Makhov and Medvedev, 2018d).

Figure 2: An example of exercises to improve posture with a gymnastic stick

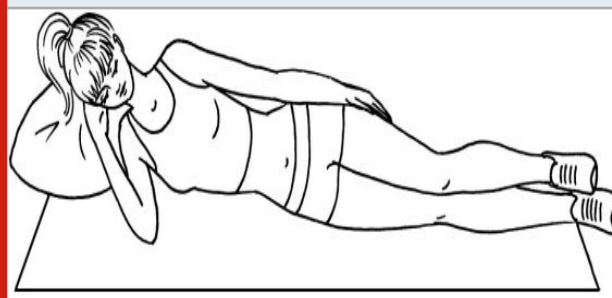


Very important for improving posture is the exercise with gymnastic objects: sticks, dumbbells, balls, shock absorbers (Makhov and Medvedev, 2018e). This type of load is a physical exercise with local and dosed power

stress, aimed at stretching the muscles, their relaxation, coordination of movements, as well as corrective and breathing exercises (Figure 2). The positive effect of exercises with objects on the body is more pronounced compared to similar exercises without objects due to the effect on the muscles of the mass of the object, its effect on the body as a lever due to the appearance of inertial forces during swing and pendulum-like movements (Pechenevskaya and German, 2017; Vlasova, 2017).

Special simulators used for various disorders of posture in the form of block apparatuses provide a pronounced effect due to the clear localization of the effect on the back muscles and due to the achievement of their long-term effect of tensile or tensile effects (Kazantseva, 2012). Very important for the effective correction of posture during exercise with weights is the ability to dose the load with a fairly high degree of accuracy. Such exercises make it possible to select schemes for individual training loads, taking into account the existing physical, psychological and age-related features. It is also possible to correct individual loads in the direction of decreasing or increasing, based on the initial level of training and the state of health of the student (Bespalov et al., 2018a).

Figure 3: Performing breathing exercises on the side



During posture correction, metered force loads are often applied in the form of repeated lifting of unsaturated weight to severe fatigue. The success of this method is due to the fact that the amount of work used causes significant shifts in the metabolism, creates opportunities for enhancing anabolism and leads to functional hypertrophy of the desired muscle group and an increase in their strength (Butova and Masalov, 2011).

For the formation and strengthening of correct posture, as a rule, make special corrective physical exercises which is able to adjust the arc of curvature in the spine. For this purpose, asymmetric exercises based on correction of the spine. They optimize the curvature, moderately stretch the muscles and ligaments on the concave arc of curvature and differentially strengthen the weakening muscles on the convex side. These exercises are very successful in terms of the unilateral strengthening of torso muscles.

Quite effective is also symmetric exercises that have minimal biomechanical impact on the curvature of the spine. When they are executed is not required, given the complex biomechanical working conditions and strain

of the locomotor system. This eliminates the risk of incorrect use. Symmetric exercises have different impacts on the symmetrical muscles of the trunk, resulting in spinal deformity are physiologically unbalanced state. The weak muscles of the trunk (e.g., on the convex arc of curvature) at each symmetric activity should have increased functional capacity, consequently they train harder than stronger muscles (Karpov et al., 2020).

It is not uncommon for posture correction applied detorsion exercises aimed at correcting the existing deformities and prevention of disorders of the spine. In these exercises, the unloading of the spine appears as a necessary moment of the General and local effect. The most common unloading position is horizontal. Lying down relieves tension of the muscles and spine can give physiological position changes the localization of the center of gravity, and the body acquires most of the footprint, providing stable equilibrium (Zemba and Morozova, 2009). Symmetric and asymmetric exercises are mainly used to influence the spine in the frontal plane. To influence the deformation in the horizontal plane, special corrective exercises of a derotational nature are used. However, this type of exercise has not found wide application, since the peculiarities of the muscle reaction to the load, carrying out the movement of the spine in a horizontal plane, have not been studied enough (Osipov and Bulanova, 2008).

In case of posture disorders, breathing exercises have been very actively used recently (Figure 3). They normalize the breathing process and coordinate breathing and movements, strengthen respiratory muscles, improve chest and diaphragm mobility, and prevent and correct chest deformation. Particular attention should be paid to deep breathing exercises that provide physiological conditions for the work of the respiratory muscles and have a restorative effect. It is very advisable to introduce breathing exercises in the initial position while lying on your side. They increase intercostal spaces. This position of the body has a moderate detorsion effect on the vertebrae and ribs from the concave side (Tsykunov, 2018).

The optimal exercise program for posture correction should be designed in such a way as to train the body and prevent the possibility of chronic exhaustion in it. In the process of doing the exercises, the resulting fatigue should increase gradually, while the moment of termination of the load in each case should be determined individually. One should strive to ensure that the next load is performed after achieving full recovery from previous physical work, not allowing the beginning of the next load, until the moment of full recovery after the previous work, since it is very dangerous for the development of chronic exhaustion (Gimazov and Bulatova, 2013).

A very important health-improving mechanism of regular physical exercises in case of posture disorders and scoliosis is their positive effect on hematological parameters, especially those related to blood microreology

(Medvedev et al., 2010). It has been established that the optimization of the state of muscles in the body, including in the paravertebral zone, occurs due to the positive dynamics of the properties of red blood cells and platelets, the movement of which through the vessels is very significantly responsible for metabolic processes in them. It is noted that regular muscle activity reduces their aggregation and improves the surface properties of the membrane (Medvedev, 2018a). There is some evidence that the activity of red blood cell aggregation is associated with the intensity of the tested physical activity and their nature. In people who regularly experience significant physical activity, the aggregation of red blood cells and impaired surface properties of their membranes can often be lower compared to those who do not engage in sports (Mal et al., 2019).

In addition, regular muscle activity lowers platelet activity to a lower physiological level (Medvedev, 2018b). In a significant number of cases, these effects were traced on productive animals in loose housing. At the same time, the similarity of the functioning mechanisms of platelet hemostasis in all mammals makes it possible to take into account the results of these studies when understanding the effects of physical activity in humans. Low platelet aggregation *in vitro* and *in vivo* on the background of dosed physical activity indicates their positive effect on platelet hemostasis (Zavalishina, 2018a). The achieved effects are due to improved metabolic processes and optimization of lipid peroxidation in plasma and platelets (Zavalishina, 2018b). This is due to the development of platelet receptor rearrangements and physiologically beneficial changes in plasma protein composition.

## CONCLUSION

Exercise is a powerful biological stimulant for most physiological functions of the body. This allows you to use dosed physical activity in order to increase the volume of any muscle groups. Feasible physical exercises also cause simultaneously positive changes in the nervous, endocrine, cardiovascular, respiratory and excretory systems. With the help of special physical exercises, you can successfully regulate the functional state of the body. Very often, such exercises are used for violations of posture. When they are performed, the vertical position of the spine is optimized, the hematological parameters of the body that provide trophic muscle, including paravertebral, are improved. The redistribution of loads on the structures of the spine with the help of exercises is able to provide correction of posture due to selective training of the muscles of the trunk, increased hemocirculation in them and normalization of the condition of the spine. Regular physical exercises for violations of posture should always be aimed at preventing its progression and correcting existing defects. Very successfully, this effect is achieved when performing physical exercises with weights.

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