

# The benefits of sports for the physical and mental health of adolescents

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## Abstract

A healthy lifestyle is the main expression of positive health behavior. Movement is a natural need of every child and is a basic preventive tool for strengthening children's health. Sport is a complex process that improves the qualities of movements, strengthens the muscles of the body and forms physical endurance through its positive influence on all organs and systems. Sports activities have a beneficial effect on the psyche and personality of adolescents and are defined as the main factor for maintaining, preserving and improving health and a healthy lifestyle. In most European countries, the teaching methodology is aimed at finding the meaning and encouraging the desire of each student to engage in regular physical activity.

The article aims to familiarize the audience with the impact of sports on various organs and systems, with the benefits for the physical and mental health of adolescents from sports activities, as well as to provide information on recommendations for the correct choice of sports depending on the constitution and disposition of adolescents.

## Keywords

sport, physical, mental health, adolescents

## Introduction

A healthy lifestyle is an essential expression of positive health behavior. Movement is a natural need of every child and is a basic preventive tool for strengthening children's health. More and more children and students spend their free time in front of the TV or computer instead of playing and doing sports in nature. All this leads to immobility, which has a negative impact on the health of the developing child's body (Peneva and Simeonov 2010).

Hypodynamia in childhood leads to incorrect body posture, overweight, muscle weakness and spinal deformities, which are leading diseases in school age. It is a serious risk factor for the occurrence of many chronic diseases and has a negative impact on the processes of growth, maturation and development of all organs and systems (Petrova et al. 2022a, b).

In immobilized adolescents, an unfavorable personal psycho-social attitude is formed – it reduces „internal control“ and „self-control“ of behavior with the resulting

more frequent involvement in harmful habits and practices (Dobrilova and Stefanov 2017).

## Aim

The article aims to familiarize the audience with the impact of sports on various organs and systems, with the benefits for the physical and mental health of adolescents from sports activities, as well as to provide information on recommendations for the correct choice of sports depending on the constitution and disposition of adolescents.

## Influence of sports on the different organs and systems

The cardiovascular system is one of the most sensitive to sports activities. As a result of the excitation that occurs in the motor area of the cerebral cortex, the sympathetic system is activated and the heartbeat increases from 60–70 to 200 beats per minute. This leads to an increase in the tone of the blood vessels and an increase in blood pressure. There is a rapid redistribution of blood from the blood depots, the capillaries of the spleen, liver, and mesentery of the intestines are contracted, and with great physical exertion, a large amount of blood can be pushed out. During muscle work, the amount of circulating blood could increase 2–3 times. The heart rate increases, the stroke volume and the minute volume increase, and thus the heart muscle is stressed. The blood circulation of the myocardium improves, and in the conditions of physical work, the coronary current increases by 15–20 times. The contractile abilities of the myocardium increase, it is able to contract less frequently and more powerfully, giving it a longer time to rest and recover (Becheva 2019).

A single physical activity leads to an increase in the respiratory function. Faster and deeper breathing leads to better ventilation. An increase in breathing air is achieved (350–500 ml in untrained; 950 ml in athletes). Oxygen saturation of the blood increases. This is due to the increased contact of the capillaries with the alveolar air and improves blood perfusion in the lungs. The amount of passing blood in the small circle of blood circulation increases (from 5.5 l in 1 min. at rest it can reach 40 l during great physical efforts). This helps in better absorption of medicines used for lung diseases. All functional indicators change positively – chest and diaphragm mobility, lung volumes increase, lung tissue elasticity, etc. Lung ventilation, breath holding time and hypoxic resistance increase (Merdzhanova et al. 2021a, b).

Beneficial changes occur in the nervous system and in the cerebral cortex – neurons permanently improve coordination when processing information in the dynamically changing environment during sports, the balance of excitatory and inhibitory processes improves, and this leads to positive changes in the type of higher nervous activity and normalization of cortical neurodynamics. The activity of the analysts is improved and the analytical ability of the cerebral cortex is enhanced.

The production and control of stress hormones increases, the productivity of age-normal anabolic hormones rises.

Thermoregulation improves. The number of erythrocytes and white blood cells in the blood grows, which boosts cellular respiration and increases the body's immune response against infections (Colcar and Ferret 2004).

The favorable changes that occur in the locomotor system refer to an increase in bone density, improved control over joint mobility, and strengthening of the surrounding musculature. Blood circulation improves, which leads to better nutrition of the cartilage tissue of the joint capsule and enhances the release of synovial fluid. The elasticity of the supporting apparatus is preserved (Becheva 2015).

## The benefits of adolescents' physical development from sports

The goal of sports activities is to ensure harmonious development and physical perfection in man. In the different periods of human life, this basic goal has concrete substantive dimensions. At an early age, sports activities strengthen and toughen the body, increase its resistance to diseases. Children develop physical qualities and capacity to act, form skills and build motivation for independent motor activity. One of the main tasks of sports in primary school is the complex development of motor skills, the ability to act and the coordination of the movements of students (Grozdeva 2010). Motor coordination has been a long-standing topic of study (Momchilova 1996a). In theory and practice, it was replaced by the concept of „dexterity“. This concept does not fully correspond to the wide variety of motor actions in sports and in other areas of social life. The development of motor coordination is increasingly being confirmed as an integral part of training in physical education and sports in primary school (Momchilova 1995). Motor coordination provides an opportunity to perform many motor actions in everyday life, in work and sports accurately, purposefully and beautifully. It affects the pace, type and method of mastering the technique of physical exercises studied, and this is a prerequisite for better results, both in terms of children's physical development and in terms of their physical capacity (Momchilova 1996b).

In preschool age, through sports activities, adolescents form motor skills and habits, develop physical qualities and improve coordination abilities (Momchilova 2002).

At school age, there is a strengthening and improvement of acquired motor skills and habits, an awareness of the importance of physical exercise for the health of the body and the formation of a need for systematic sports activities.

In high school age until adulthood, sports activities should be established as a basic need. Independently or with the help of his family, the future young person should integrate sports and physical activity into his lifestyle, so as to guarantee his personal health (Dikova 2020).

Each sport has different advantages. Running as a type of physical activity is often overlooked because it does not have a quick effect, but it trains the heart by influencing cardiac and extracardiac factors. The results of this exercise include improved muscle tone, weight loss and a significant increase in energy.

Cycling is very beneficial. Improves blood circulation, work of the heart, lungs and organs of vision, trains the vestibular apparatus, and also prevents the appearance of varicose veins (Zhelyazkov 2016).

For adolescents who are contraindicated for strong physical exertion, swimming is the sport that develops the respiratory and cardiovascular systems and harmoniously models the muscles of the body. There are no age restrictions for practicing the sport of swimming. Swimming is prescribed for the treatment and prevention of curvature of the spine and deformities of the chest in children (Rangelova 2023).

Sports and physical activity are an integral part of a healthy lifestyle, as regular exercise can not only strengthen muscles, but also help increase immunity, remove toxins from the body and build physical endurance. One of the key rules, but neglected today, is the correct distribution of time that adolescents devote to physical and mental work. Adolescents often neglect the time for sports (Merdzhanova 2020).

This leads to insufficient physical activity – variable lifestyle factors that influence the occurrence of cardiovascular diseases (Chloubová et al. 2019).

What is important for children's physical activity and the prevention of cardiovascular risk, apart from active sports, is its duration over time.

A study by Kožuchová and Bašková (2013) on the frequency of physical activity in school-aged children and adolescents among 1187 aged 11 to 15 years reported that 13-year-old and 15-year-old boys showed a significantly higher frequency of physical activity. The authors state that a higher level of knowledge about the importance of physical activity in children of school age and adolescence is an important part of a healthy lifestyle. Physical activity of children of school age and adolescence plays a significant role in their daily routine task. It is essential for maintaining optimal physical and mental health. Within it is important to support intervention measures regular physical activity, which is part of school activities, but at the same time pay attention to extracurricular physical activity (Kožuchová and Bašková 2013).

A study by Popova and Stambolova (2018) examining the level of physical activity among students aged 13 to 18 years indicates that adolescents most often spend one and two hours a day watching TV and playing computer games – respectively approximately 60% and 50% of them. The share of students who spend 4 or more hours a day watching TV and playing computer games is also high – respectively, approximately 19% spend 4, 5 or 6 hours a day in front of the TV, and 30% – in front of the computer playing games. The most common reasons for reducing the time students spend on walks and playing outside are the need for time to prepare for classes, but also the desire to watch TV and play computer games. Every fourth student does not do any kind of sport. Only approximately 32% of adolescents meet the recommendations for daily physical activity and only half of those who exercise meet the recommendations for a minimum of 60 minutes of physical activity per day (Popova and Stambolova 2018).

These studies prove that there is an unfavorable tendency for adolescents to neglect the time devoted to sports.

For this reason, it is necessary to encourage a love for sports and sports activities should start at an early age. Parents, teachers and coaches alike have a fundamental and important role in encouraging adolescents to participate in extracurricular sports according to their interests. Educating the need for sports activities will support the construction of the overall value system, at the center of which is good health, and the tool for its achievement should be a healthy lifestyle and optimal physical activity (Merdzhanova et al. 2022).

In case of insufficient physical activity, guidelines should be given to increase it and training should be conducted on its protective role on the cardiovascular system, weight and health in general (Jiménez-Pavón et al. 2013).

## Benefits of sports for adolescent mental health

When the human body is stressed or in pain, neurochemicals called endorphins are produced in the brain's hippocampus (a structure responsible for memory). Endorphins, which are structurally similar to the drug morphine, are considered natural pain relievers because they activate opioid receptors in the brain, which help minimize discomfort and ease a person's psyche. Endorphins can also help create feelings of euphoria and happiness. After the discovery of endorphins, the idea emerged that exercise produces a huge rush of these neurochemicals. Jogging is very popular as a practice because after a strenuous workout, endorphins are responsible for the euphoric feeling in the psyche that so many people experience. People who exercise regularly do so because it gives them a huge sense of well-being. They feel more energetic throughout the day, sleep better at night, have a sharper memory, and feel more relaxed and positive about themselves and life (Angelova-Igova and Lecoq 2023).

Another mental health benefit of exercise is increased energy levels. It has been proven that the more one trains, the more endurance one gets. Sport maintains the hormonal balance in the body. Physical activity can greatly affect hormonal health. Sport has a very positive effect on the production of sex hormones. A major benefit of exercise is its ability to lower insulin levels and increase insulin sensitivity. One of the great benefits of playing sports is an individual's enhanced self-esteem and sense of attractiveness (Ivanov and Tomova 2011).

Aerobic exercise improves concentration by influencing the hippocampus. The hippocampus is responsible for forming, organizing and storing memories. This brain structure grows when people become fitter through sports, and this partly explains the benefit of increasing the ability to remember new information (Lahti et al. 2023).

## Sports and depression

From a public health perspective, mental illness currently represents a serious issue – and its occurrence is increasing. According to the WHO (2017), mental diseases affect approximately 25% of the European population every

year, and depression is currently one of the most common diseases in the population (WHO 2017).

In addition, depression is the most common cause of invalidity of population on a global scale. It belongs to the main risk factors related to death caused by suicide. Similarly, anxiety disorders and addictions are very common diagnoses which have severe health, social, and financial consequences. In Europe, suicide is the cause of death in more than 58 000 cases every year. It is estimated that suicide attempts are even more frequent. It is the second most common cause of death in the age group of 15–19 years old. A special group that is very sensitive to stigmatization and discrimination is children and adolescents – as their psychosocial development is not yet complete. Self-esteem and self-perception in puberty and adolescence is more influenced by the external effects and reactions from their environment. Mental disorders represent a significant obstacle in the education, family and social life of adolescents and children (Škodová and Polčová 2020).

The impact of sport and its socially significant role is also decisive for the manifestation and non-manifestation of various forms of aggression and depression (Petrova et al. 2020).

This manifestation also depends on the personality of the teacher, the teacher, the coach, who in most cases should have a positive influence on the mental stability and emotional stability of the athletes – children, students, students, young people (Becheva et al. 2015).

Within the framework of the Project to the SU (No. 80-10-63/2019 and No. 80-10-45/2020), a study was conducted with the aim to report the influence of the levels of various types of aggressive reaction and depression through sports activities. It has been ascertained that the sports of judo, fitness, basketball and tennis improve the mental resilience and emotional stability of adolescents (Vaneva and Stoyanova 2021). Studies show that exercise is a natural and effective treatment for anxiety. They relieve tension and stress, increase physical and mental energy, and improve well-being through the release of endorphins, thereby treating mild to moderate depression as effectively as antidepressants, but without the side effects (Young 2016).

As we noted above, training improves the quality of sleep, because the time of deep sleep increases. This phase helps boost immune function, maintain heart health, and control stress and anxiety.

## Recommendations for choosing sports in adolescents

The data from the latest studies on the health status of students carried out by the Scientific Institute of Hygiene and Occupational Diseases at the Medical Academy – Sofia / Bulgaria / indicate that a number of disorders of the musculoskeletal system, metabolism, some neurotic reactions and behavioral deviations have been found such as initial chronic diseases of the cardiovascular, motor and other systems of the body (Popova and Stambolova 2018).

International recommendations regarding physical activity in school-age children – 5–18 years old – are for moderate to intense physical activity daily for 1 hour (EU 2008).

Encouraging physical activity, educating about its benefits and the risks of its absence, promoting physical activity and the need for it among younger and adolescent people should be the commitment of the state, government, society, family and parents, as well as teachers and healthcare professionals working in healthcare, and more specifically school healthcare (Benchev 2010).

The choice of physical activity depends on many circumstances. The choice of a sports activity depends on the current physical condition of the adolescent and what are the possibilities in their place of residence to perform a certain type of physical activity. Children and adolescents are not as durable as adults and it should be taken into account that they expend more energy for each action. Whichever sport is chosen, the benefits will outweigh the indicators of harm. Preference should be given to general strengthening types of exercise that have a positive effect on the musculoskeletal system and the full functioning of the heart (Merdzhanova 2019).

The health benefits of sports during adolescence come from the following: when choosing sports, attention should be paid to the physique of the teenager. A short child will not be able to prove himself in basketball, but if he has strong legs, he could very well show good results in running. Attention should also be paid to disposition. An active child will not be interested in playing chess, but in a team game they will be equal. Gymnastics and dancing are recommended for developing plasticity, femininity, and harmony in girls (Trapani G 2014).

It is recommended to lay the foundations in the study of the basic concepts and activities of tourism already at the initial stage of the basic educational degree in order to attract the learners to active sports activities and games in nature. In this way, young people's interests are directed to other types of sports related to tourism, for example mountaineering, sport climbing, orienteering, skiing, ski-orienteering and others. They are related to the experience of strong emotions and fully satisfy the need for motor activity (Panayotov et al. 2016).

## Conclusion

Sport is a complex process that improves the qualities of development in the body, psyche and personality of children and adolescents, and is defined as a main factor for maintaining, preserving and improving health and a healthy lifestyle (Petrova et al. 2022a, b).

In most European countries, the teaching methodology is aimed at finding the meaning and encouraging the desire of each student to engage in regular physical activity, which is important not only for maintaining a normal body weight (Merdzhanova et al. 2021a, b) but also for protecting against a number of diseases, for improving physical and mental health, endurance, concentration and



quality of sleep. The cognitive effect of exercise proves that the brain does not work in isolation. The psychosocial role of sports in adolescents is reduced to developing valuable personal, socially significant qualities: courage, initiative, resourcefulness, self-control, independence, self-confidence, adaptability (Penkova et al. 2022).

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