ISSN NO: 2770-0003
Date of Publication: 30-03-2022

Age Dynamics and Adaptive Changes in Children Aged 10-12 Years Under the Influence of Athletics

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Annotation. The motor abilities of children and adolescents are very closely related to their morphological and functional characteristics, specific for each age group. Track and field athletics are a good prevention of various diseases of the musculoskeletal system (flat feet, poor posture, scoliosis), respiratory and cardiovascular systems, have a beneficial effect on metabolic processes, increase the body's defenses. In this regard, this article shows the functional changes and age dynamics of young children in this area.

Key words: training, youth, athletics, functional system, age dynamics.

Today it is difficult to overestimate the relevance of the issues of maintaining and strengthening the health of schoolchildren, therefore, the following accents should be noted as the main guidelines for the physical education of children: x comprehensive improvement of the motor abilities of schoolchildren and an increase in their motor activity; x promotion of health and prevention of diseases by cultivating in children a sustainable interest and a positive emotional and value attitude to physical culture, health and sports activities; x development of not only physical, but also moral qualities that contribute to strengthening the skills of internal organization, self-discipline and willpower; x development of communicative qualities of the individual, skills of physical and psycho-emotional recreation and rehabilitation, as well as an increase in the experience of competitive activity and constructive work in a team.

According to the Institute of Developmental Physiology of the Russian Academy of Education, today many textbooks, original methods and new technologies are being developed without due regard for the age and functional capabilities of children and adolescents. The complex of school risk factors negatively affects the development and health of students. Many children, especially in the first weeks and months of training, experience changes in the body that allow us to talk about "school stress", "school shock", "adaptation disease". In the field of educational activities, stressful conditions, along with a threat to health, negatively affect the effectiveness of learning, reduce satisfaction with learning, contribute to an increase in the physiological cost of intense mental work, and cause a number of other adverse social, psychological and economic consequences.

Respiratory system. If we consider the body of those involved, then we can find out the effect of athletics on the pulmonary (respiratory), circulatory, nervous, and muscular systems of young athletes. With systematic exercises, for example, sprinting among teenage runners, we can see the distinctive aspects of the cardiovascular system.

With regular exercise or sports:

- the oxygen capacity of the blood increases, as the number of red blood cells and the amount of hemoglobin in them increase;
- increases the body's resistance to various diseases, due to increased activity of leukocytes;
- recovery processes are accelerated after a significant loss of blood.

Muscular work. During muscle work, tissues, especially skeletal muscles, require significantly more oxygen than at rest, and produce more carbon dioxide. This leads to an increase in MOD both due to increased respiration and due to an increase in tidal volume. The harder the work, the relatively greater the MOD.

During physical activity, blood circulation is rebuilt to meet the needs of working muscles to the maximum. For example, at rest, the blood makes a complete circulation in 21-22 seconds, during physical work - in 8 seconds or less, while the volume of circulating blood can increase up to 40 l / min. Also, the mechanism of blood redistribution operates in the body - vasodilation in a working organ and consequently, increased blood flow in it and narrowing of the vessels of non-working organs.

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At rest, only a small number of capillaries function in the organ; during operation, the number of opened capillaries increases many times over. Such adaptive reactions increase the supply of tissues with oxygen and nutrients and accelerate the removal of metabolic products. Muscular activity causes an increase in heart rate. With intense muscular work, the heart rate can reach 180-215 beats / min. The increase in heart rate is directly proportional to the power of muscle work. The greater the power of work, the higher the heart rate. Nevertheless, with the same power of muscular work, the heart rate in less trained individuals is much higher. In addition, when performing any motor activity, heart rate changes depending on gender, age, well-being, training conditions (temperature, air humidity, time of day, etc.).

Cardiac system. As a result of systematic exercise and sports, the size and weight of the heart increases due to the thickening of the walls of the heart muscle and an increase in its volume. The blood supply to the heart itself improves, and therefore its nutrition. Such changes increase the power and efficiency of the heart.

Circulatory system. During physical training, the number of red blood cells and lymphocytes in the blood increases. One of the proofs that as a result of physical exercises the body's defenses increase, the body's resistance against infection increases.

People who systematically engage in physical exercises and sports are less likely to get sick and if they get sick, then in most cases they tolerate infectious diseases more easily. With prolonged muscle work, the amount of sugar in the blood decreases.

With regular exercise, cholesterol in the bloodstream decreases and the anticoagulant system is activated, which prevents the formation of blood clots in the vessels.

The physiological mechanisms and patterns of development of such physical qualities as speed and endurance are based on the features of the course of physiological processes in the central nervous system - the lability of nerve centers and the mobility of nervous processes (E.P.Ilyin, 1983; I.S.Belenko, 2010; A.N.Polikarpochkin, 2006) and reserves for the development of the body's aerobic capabilities (P.E.Motylyanskaya, V.N.Artamonov, 1989; A.N.Korzhenevsky et al., 1993; E.B.Sologub, 1993; L.V.Volkov , 1997; A.A.Shamardin et al., 2008; Lacour J.R. et al., 2009; A.A.Kuzmin, 2011).

Conclusion. Based on the foregoing, we can conclude that athletics are an important factor that allows you to change the body involved in a positive way and prevent the negative consequences of various diseases. It is very important in coaching to manage the state of an athlete, relying not only on intuition and sports results, but also to use objective morphological, physiological indicators of the functional systems of the body, which always contributes to the preparation of a reliable reserve in running for short, medium and long distances. It should be taken into account that the increase in sports readiness in children and adolescents is accompanied by the improvement of the functions and systems of the body.

Therefore, functional ability criteria can differ significantly at each age level. Use sensitive periods to improve accessibility.

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ISSN NO: 2770-0003
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