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Technologies for assessing the psycho-emotional state of athletes during physical development: Literature review

Safoyev Hasan Aminovich

Bukhara Institute of Engineering and Technology, Department of Physical Culture

Mamurov Bakhrom Bakhshulloyevich

Bukhara Institute of Engineering and Technology, Department of Physical Culture

Abstract---According to modern concepts, a child's health is a state of life that corresponds to his biological age, harmonious physical development, the formation of adaptive and compensatory reactions in the process of growth, development and interaction with the environment. It is important to note that the child population is most sensitive to the effects of adverse environmental factors.

Keywords---school children, health condition, physical development, intraschool factors, daily routine.

It is known that in childhood and adolescence the foundations of health and functioning of all organs and physiological systems are formed. One of the main tasks of the modern state is the comprehensive development of the body and the health of the younger generation [9].

In recent years, the country has taken consistent measures to promote physical culture and sports, promote a healthy lifestyle among the population, create the necessary conditions for the physical rehabilitation of people with disabilities and ensure the country's proper participation in international sports arenas. is being done. In order to improve the health of the population and improve the physical development of children, adolescents and youth, the Decree of the President of the Republic of Uzbekistan dated 24.01.2020 No. PF-5924 was introduced and adopted. In order to form a comprehensively mature and physically healthy person with a high culture in the country, this decree sets priorities for improving the skills and knowledge of the population in the field of physical culture and sports, innovative forms and methods of selection of talented athletes. adopted for the purpose of introduction.

Due to the well-known morphological and functional characteristics, a growing organism suffers even from subthreshold concentrations of harmful substances,

thereby becoming a kind of indicator of the state of the environment [4]. A number of researchers point to a pronounced trend towards a deterioration in the health status of children and adolescents around the world. Adverse changes in the health status of the child population are characterized by an increase in the prevalence of functional disorders and chronic diseases, a change in the structure of health disorders, and a deterioration in physical development indicators [2].

In the implementation of this concept, of particular importance, in our opinion, is the study and disclosure of age-related features of the formation of the psychophysiological state of the body of young athletes under the influence of training programs for youth sports. Solving the issue of the influence of the applied means and methods of pedagogical influence in the process of physical education and in sports on the formation of the psychophysiological state of the body of young athletes at different stages of ontogenesis is one of the problems of youth sports [2].

A longitudinal study of the incidence of children in Bukhara, starting from the age of 5, showed an increase in the occupancy rate of III and IV health groups over nine years of observation. In the structure of health changes, the first five rank places belonged to functional deviations of the cardiovascular system, musculoskeletal system, digestive system, mental sphere and vision. In the structure of chronic pathology, the leading role belonged to diseases of the gastrointestinal tract, musculoskeletal. In dynamics, an increase in the proportion of chronic diseases of the digestive system and the organ of vision was noted [7]. An analysis of the incidence of children of older adolescence (15-17 years) in Bukhara over ten years showed an increase in the overall incidence of 1.5 times. Its maximum growth was registered for diseases of the respiratory system, eye and its accessory apparatus, musculoskeletal and digestive systems, as well as for injuries, poisoning and pathology of the nervous system. The total listed diseases in the structure of adolescent morbidity amounted to 80% [5]. Monitoring the health of schoolchildren 7–17 years old from 1980 to 2015. in the Bukhara sports complex confirmed the general tendency towards the deterioration of the health of the child population. During the mentioned period, the proportion of children and adolescents with health groups I and II has significantly decreased, and the number of those surveyed with health group III has increased. The average number of morphofunctional deviations and chronic diseases at the stage of clinical remission increased throughout the observation period [10]. In a comprehensive medical examination of schoolchildren 11–17 years old (172 boys, 131 girls), performed in Murmansk by A.A. Aleksandrov et al. (2015) also established a low level of student health: 41% of schoolchildren had chronic diseases, and the frequency of their registration increased with age.

Knowledge about the age-related features of the formation of the psychophysiological state of the body of young athletes is formed under the influence of total physical loads, in particular, in the process of physical education of general education and youth sports schools. It is known that the process of physical education of students of general education schools in the life of a growing organism is considered as a natural age-related process of development of the motor function of students, while playing sports significantly stimulates the development of the motor function of students [13, 20, 14]. According to the

authors, locomotor development during the first two decades of life contributes to the accumulation of motor potential by the body, the functional activity of various systems and, accordingly, the psychophysiological potential. According to a number of scientists, the process of physical development is associated with the preservation of the health level of students [11]. The opinion of scientists is ambiguous. One of the main components that contribute to the preservation of the health of children, adolescents, and youth can be considered the use of physical education and sports. At the same time, it is necessary to recognize the opinion of other scientists that an excessive amount of training loads or their inadequacy in intensity to the functional reserves of a growing organism contribute to the formation of stress associated with the process of disadaptation of the psychophysiological state of athletes at different stages of ontogenesis.

In the process of school education, the prevalence of chronic diseases increased and the incidence of diseases of the musculoskeletal system, the organ of vision and the digestive system increased [11]. An analysis of the health status of rural schoolchildren in Bukhara region showed that only 30% of the surveyed could be enrolled in health group I, the rest - 66 and 4% - had health groups II and III, respectively. Among the pathologies identified, posture disorders (42%), caries (39%) and myopia (25%) were more often recorded [12]. Physical development is considered an important indicator characterizing the health of children, reflecting the influence of environmental factors on a growing organism and which seems to be prognostically significant for the state of health in adult life. [13]. Numerous studies indicate the multidirectional dynamics of the physical development of modern children and adolescents. Thus, a comparative analysis of the physical development of schoolchildren in Bukhara 8-15 years old in the 1960s, 1980s and 2000s showed that modern children surpass their peers in basic anthropometric indicators, while their increase occurs synchronously. Changes in the proportions of the body of modern schoolchildren are most clearly reflected in the increase in leg length. At the same time, against the background of the growth of anthropometric indicators, a decrease in power capabilities was established. A similar study of the physical development of schoolchildren in Bukhara 8-16 years old showed a significant decrease in anthropometric indicators in the 2010s compared to the 1980s, which indicates the presence of regional features of this process [1].

When analyzing the physical development of schoolchildren in Bukhara, it was determined that a significant part of children aged 8-16 years (43.4%) had an average level of physical development, 45.5% of students showed indicators above average, high and very high, and 11 , 1% - below average, low and very low. Gender characteristics were also revealed: the share of students with high indicators of physical development was twice as high among boys, and with average indicators among girls. Also, the surveyed showed a tendency to an increase in the indices of physical development in comparison with their peers in 1998 and 2004. [15]. Among children and adolescents 7-17 years old in Bukhara and the Bukhara sports complex, persons with an average level of physical development also prevailed. However, the proportion of children with indicators above average and high was higher in the group of girls, and below average and low in the group of boys [6]. One of the characteristics of physical development is its harmony. Currently, there is a tendency towards an increase in the number of

children with disharmonious and sharply disharmonious development. Thus, when analyzing the health status of schoolchildren at the Bukhara Sports Complex, it was found that 68.1% had harmonious physical development, 25.8% disharmonious, and 6.1% sharply disharmonious [7]. When analyzing the physical development of children and adolescents in Bukhara, it was found that disharmonious development due to excess or deficiency of body weight was in 23.7% of girls and 32.2% of boys, sharply disharmonious - in 11.6 and 12.8% of those surveyed, respectively [19].

It is known that the state of health of the younger generation is formed under the influence of a complex of factors: socio-economic, environmental, medicobiological, climatic-geographical, etc. Identification, study and ranking of these determinants makes it possible to justify priority preventive measures to prevent possible deviations in the health of children and adolescents.

A fairly large number of scientific works are devoted to this problem [9]. O.Yu. Milushkina et al. (2014) conducted a study of the contribution of some of the above factors to the formation of the morphofunctional status of Moscow schoolchildren, which made it possible to reveal reliable correlations with the level of physical activity, the duration of contact with a computer and various gadgets, high educational loads, malnutrition, unfavorable environmental conditions, the level of sanitary and epidemiological well-being of the educational organization, smoking. In children of grades 1–4, the influence of physical activity was 45.3%, social factors - 19.7%, educational loads - 10.2%, lifestyle - 9.8%, and among students in grades 5–11 - 18.4, 9.6, 35.8 and 27.6%, respectively [4].

As a result of a study of the health status of schoolchildren 6–14 years old in Bukhara region, a significant influence on their health was found of such factors as the state of health of the mother when carrying and giving birth to a child, the way of feeding, the well-being of the family, the duration of the child's sleep, walks in the fresh air, the amount of time performed at the computer, motor activity [5]. The study of the influence of various factors and their groups on the health of adolescents in Bukhara region showed that the leading were socio-economic factors (24.4%), followed by socio-psychological (20.7%). The contribution of behavior and lifestyle was 20.3%, medical and organizational factors (the impact of health care) - 18.8%, and medical and demographic - 15.8% [12].

Comparative analysis of the anthropometric indicators of 8–17 year old boys from Bukhara, who lived in two different hygienic zones of the city, differing in the total coefficients of atmospheric air quality (clean and dirty), showed that the annual body length gains were higher in children in the "clean zone". Children living in the "dirty zone" showed a significant increase in body weight. The author suggested that environmental pollution can be considered a condition that has a significant impact on human ontogenetic development [7]. The study of the influence of potential risk factors on biological maturity and the harmony of the morphological status of preschoolers and primary schoolchildren in Vladivostok showed that the nutritional factor, hygienically-normalized factors, maternal nutrition during pregnancy, social and hygienic factors and factors of early childhood had the greatest influence on this status [8].

A special place in the totality of conditions affecting the health of children is occupied by determinants that affect the learning process in general education organizations. These are the so-called school-related risk factors: an insufficient level of sanitary and epidemiological well-being in educational institutions (including malnutrition and imperfection of school medical supervision), an intensification of the educational process, stressful pedagogical tactics, deficiencies in the physical education system and hypokinesia, non-observance of the study regime and rest, sleep and stay in the air, problems of organizing medical care for schoolchildren and monitoring their health [12]. So, as a result of a sanitary and hygienic examination of educational institutions in Bukhara, the following factors of the in-school environment were identified that adversely affect the health of children: high academic loads, irrational organization of the educational process, non-observance of hygienic regulations for seating students, insufficient conditions for physical education, violation of the requirements for light and air-thermal conditions [5]. When examining secondary schools in Bukhara district, Bukhara sports complex of the region, it was found that only 9.1% of them could be attributed to sanitary and hygienic safe (I level). 81.9% of general education organizations had significant shortcomings in the provision of the educational process and were ranked in the II group of sanitary well-being, the rest of the schools were classified as the most unfavorable in terms of sanitation. The authors have shown statistically significant differences in the number of students with health groups III – IV in sanitary safe and disadvantaged schools, as well as the correlation between learning conditions and the proportion of children with health groups III – IV [10]. It was found that in educational institutions with an intensive form of education (medical lyceums and a center for gifted children), students had more significant negative changes in health indicators than children and adolescents in educational schools [17]. The study of the state of health of children in organized groups of Vladivostok showed the influence on the occurrence of various pathological conditions of such factors as unsatisfactory nutrition, poor illumination of the workplace, improperly selected furniture and intensification of the educational process [7].

One of the conditions that affect the health of a child is an individual daily routine (daily routine). A rational daily routine corresponding to the age characteristics of children allows ensuring the optimal level of physical activity, including in the open air, good rest, sufficient sleep in duration, which, of course, contributes to the normal growth and development of the body. It is known that the main elements of the daily routine of children are: diet, time spent in the air, duration and frequency of sleep, duration and place of compulsory classes (both in educational institutions and at home), free time, physical activity. The formation of an individual daily routine is justified by the influence of a natural factor (daily biological rhythms) and factors of the social environment (education in preschool, school and out-of-school organizations, an increase in teaching loads and the volume of educational material, urbanization, etc.). Scientific and technological progress has led to a decrease in the influence of the first factor and an increase in the influence of the second. As a child grows up, his daily routine undergoes changes, which is explained by the emergence of new interests [5]. An increase in school workload also entails violations in the daily routine of students [12].

According to the results of a survey of pupils in grades 7-11 of the Bukhara sports complex, it was determined that only 22% of them planned their activities and adhered to a certain daily routine. Deficit of night sleep was noted by 38.9% of respondents, daily stay in the fresh air - only 56.9% [3]. When studying the daily routine of pupils of the first, second and third stages of education in Omsk schools, it was found that the duration of night sleep was lower than the recommended one in all age groups, the most pronounced deficit was observed in the maximum duration of homework at the first stage of education. The time spent in the fresh air did not correspond to the recommended time for middle school boys, high school girls and younger schoolchildren. It should be noted that passive forms prevailed among the main elements of recreation for students of all ages [4].

The concept of "state" is a general methodological category, it means "a characteristic of the existence of objects and phenomena, the realization of being at a given and all subsequent moments in time" [8]. It is known that the bioelectrical activity of the cerebral cortex reflects the psychophysiological state of a person [4, 7]. Studies of the bioelectrical activity of the cortex in children and adolescents are mainly devoted to the study of cognitive processes and the identification of functional disorders in brain activity [13, 4]. In the scientific and methodological literature, the bioelectrical activity of the cerebral cortex in the process of motor activity is presented mainly in highly skilled athletes [1, 5, 6, 11]. In the practice of children's and youth sports, this problem, the age-related features of the psychophysiological adaptation of the body of young athletes to physical activity, taking into account the bioelectrical activity of the cerebral cortex, have not been sufficiently studied.

Until now, the age-related features of the psycho-physiological adaptation of the body of young athletes of cyclic and acyclic sports to physical loads have been fragmentarily studied, modern methodological approaches aimed at diagnosing and assessing the psycho-physiological state of athletes at different stages of "sports" ontogenesis have not been sufficiently developed, which can complicate timely differentiated correction of educational -training process, reduce the effectiveness of sports activities and the level of health.

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