



**COMPREHENSIVE ASSESSMENT OF THE PHYSICAL DEVELOPMENT AND  
FUNCTIONAL STATUS OF THE CARDIOVASCULAR SYSTEM IN CHILDREN AND  
ADOLESCENTS INVOLVED IN NATIONAL SPORTS**

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**Abstract**

The physical health of children and adolescents is a basic condition for their all-round and harmonious development, and the basis for the development of intellectual, moral and aesthetic qualities. Physical education is closely linked to children's physical and mental development. The guidelines for kindergarten education clearly require that kindergarten education is age-appropriate and appropriate to the physical and mental development of children and adolescents.

**Keywords:** adolescents, sportsmen, physical development, health

**Relevance**

People's health is an important symbol of national well-being and national prosperity. In recent years, amendments have been made to the Physical Culture and Sport Act (4.09.2017) and a presidential decree on measures to radically improve the system of State administration in the area of physical culture and sport was published (05.03.2018). The Programme of Comprehensive Measures for the Further Development and Promotion of Olympic Sports 2018-2021 provides for the organization of medical-biological, pharmacological and sports-psychological support and preferential in-depth medical care for the members of the national teams, increasing their psychological resilience. With the development of industrialization, urbanization, population ageing and changes in the ecological environment and lifestyle, chronic non-communicable diseases (hereinafter referred to as chronic diseases) have become the main cause of death and burden of disease for residents. Cardiovascular and cerebrovascular diseases, cancer, chronic respiratory diseases, diabetes and other chronic diseases account for more than 70% of the total disease burden, which has become an important factor limiting the increase in healthy life expectancy. The age of the kurash sportsmen under study is one of the critical stages in human life. High physical and psycho-emotional loads on the background of the processes of growth and formation of organs and systems impose increased demands on the body of young athletes and under certain circumstances can lead to a number of disorders in physical development and health.

Kurash is our "culture", which is the soul of the country and the nation; the national wrestling of the Uzbek people. The wrestling is carried out in a stand-up position with action without grabbing hands at the feet. Wrestling in a parterre or lying down is not allowed. There are a lot of techniques in the technical arsenal of kuresa. Many of them are used in Judo, Sambo, Greco-Roman, Freestyle and other types of martial arts. Throws can be made by arbitrary grasping of clothes, one or two hands at the waist, grasping of hands and torso, throws underfoot, underhooks, hooks, underhooks, over the back, over the hip, throws over the chest are very popular.



The rules of Uzbek kurash, like the rules of other wrestling disciplines, are improving from year to year, adopting new attractive techniques to make wrestling more entertaining and is a national wrestling with special individuality and distinction from other types of wrestling, passed down to us as a national treasure from generation to generation, and is one of the official national sports included in the State Sports Register. Uzbekistan has achieved outstanding achievements in recent years, coordinated development of mass and competitive sports, and the sports industry is on the rise. The important role of sports culture is becoming increasingly visible in the development of sport. There are more than 60 sports federations in Uzbekistan. Their main tasks are to coordinate and develop the sport in the country. Together with the Ministry of Culture and Sports of Uzbekistan and other organizations, sports federations hold international and regional competitions, develop relevant sports and work to popularize sport among the population. Proceeding from the experience of many countries, one can conclude that the state concern for national sports and physical culture has its manifold benefits. Support for these areas of the social sphere helps to create the necessary conditions for the moral and physical rehabilitation of society's youth and children.

The aim of the study: was to assess the physical development and functional status of the cardiovascular system in children and adolescents participating in national sports

Materials and methods of research: We examined children and adolescents aged 11 to 16 years old engaged in national sports in children and youth sports schools in Tashkent, as well as in specialized boarding schools. Physical development and the functional state of the cardiovascular, respiratory and autonomic nervous systems were studied and evaluated; the morbidity rate was examined on the basis of in-depth medical examinations and the number of visits to medical institutions. A programme of organizational, therapeutic and prophylactic measures for young athletes in national sports has been developed. A comparative analysis of risk factors revealed statistically significant differences: there are four times more adolescents with lower body weight among kurash athletes and almost no adolescents with a high body weight.

An objective assessment of the health status of children and adolescents engaged in kurash showed that 80% of all young athletes examined were found to be practically healthy, while 20% had abnormalities. To assess the condition of the cardiovascular system we performed the Martinet-Kushelevsky test. In this test, a Kurashite athlete, after a 10-minute rest in a sitting position, has his pulse counted every 10 seconds until the same figures are obtained 3 times. The BP and BPM are then measured. All the values found are baseline values. The subject then does 20 deep squats, with the arms thrown forward, in 30 seconds (to the metronome). After squatting, the subject sits down; for the first 10 s of the 1st minute of the recovery period, the pulse is counted and in the remaining 50 s, the BP is measured. At the beginning of the 2nd minute of the recovery period in 10-second intervals, the heart rate is measured to 3 times the baseline values. At the end of the test, the BP is measured. Sometimes in the recovery period there may be a decrease in heart rate below baseline ("negative phase").

The test includes 3 loads: 1) 20 squats in 30 seconds, 2) 15-second run, 3) running in place for 3 min at 180 steps per min. The first exercise is a warm-up, the second reveals the ability to rapidly increase

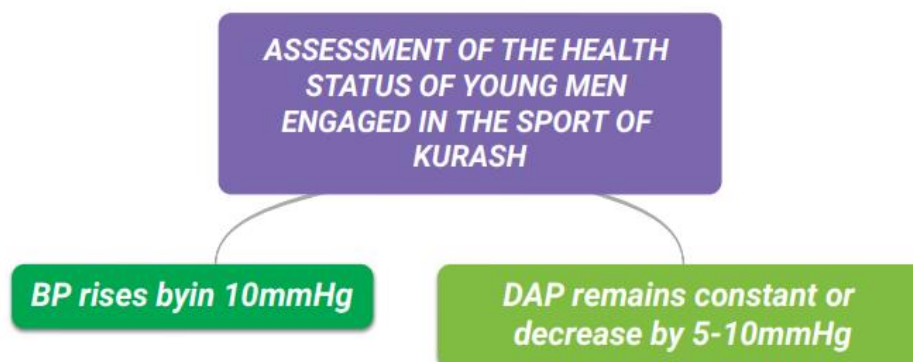


circulation, and the third reveals the body's ability to sustain increased circulation at a high level for a relatively long time.

The results of the test are assessed by pulse, blood pressure and recovery time. Normotonic reaction: pulse rate increases to 16-20 beats in 10 seconds (60-80% of baseline), BP increases by 10-30 mmHg (max 150% of baseline), BP remains constant or decreases by 5-10 mmHg. Fifty Kurash athletes were examined.

## Conclusion

Thus, the assessment of health status of boys engaged in kurash sport shows that 80% of surveyed kurash sportsmen have normotonic reaction (heart rate increased up to 16-20 beats per 10 s (60-80% of the baseline), BP increased by 10-30 mmHg. Hg (max 150 % of baseline), BP remains constant or decreases by 5-10 mmHg); and the remaining 20% have hypertensive response - significant increase of BP (up to 200-220 mmHg) and DAP, pulse rate up to 170-180 bpm. The cardiovascular system in 80% of the athletes we surveyed who participate in the national sport of kurash corresponds to a healthy body (normotonic reaction), and only 20% show abnormalities (hypertonic reaction).



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