

Influence of National Outdoor Games on Cardiovascular System of Children 5-6 Years Old in terms of Midlands of Kyrgyzstan

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Abstract

This work studies the characteristics of national outdoor games and their influence on cardiovascular system of children 5-6 years old, who are permanent residents of the midlands. Research methods used: physiometry (arterial tension, cardiac rate); controlled activity test (Martin-Kushelevsky test); mathematical and statistical methods. Overall average of heart rate, blood pressure and variability of changes in these parameters of children who are not involved and who are involved in national outdoor games were defined. Samples with measured muscular load revealed a significant increase in functional reserve of cardiovascular system both of boys and girls. Use of national outdoor games for children of 5-6 years old engaged in national outdoor games removes existed lack of sustained dynamics of development of functional capabilities, harmonizes the development of motor and cardiovascular systems. The principles of the methodology and organization of national outdoor games training for children of 5-6 years old were developed.

Keywords: Health, National Outdoor Games, Cardiovascular System, Ethnopedagogical School

Introduction

National outdoor games are an integral part of international, aesthetic and physical education of pupil. Children of different people attending child care centers every day communicate, play different games, bringing in elements of activity of the national culture. Children in the games are most fascinated with game action, which feature is children activity in gaming purposes. Game collisions causes that preschoolers aspire to analyze, compare, explore hidden causes of phenomena. The game produces the most important property of teachings - the need to learn, to know, and to be able.

The great importance for formation of full-fledged personality has games originating from historically formed ethnos traditions - national games.

In mentality and cultural traditions of the Kyrgyz people health has been considered as one of the highest human values.

Kyrgyz ethnos has the experience of social and spiritual contribution to formation and maintenance of human health in conditions of midlands. Scientific research involves a comprehensive study of the phenomenon of health from the position of formation of balance between health expenditure and replenishment of its potential in mountainous climate during the full life cycle (A. Kh Karasaeva, 2010).

Researchers of Kyrgyzstan gained a large amount of facts reflecting adaptation mechanisms and features of functioning of individual systems: cardiovascular, respiratory and other of permanent residents of midlands, but such discrete approach does not reflect the state of human health as an integral body. Modern means of physical culture aimed at improving the physical qualities of human at the biological level of its existence. As differentiated from modern means of physical culture, ethnopedagogical school of Kyrgyz people had more complex approach: they developed physical, intellectual, mental properties and social skills.

Original games of Kyrgyz people were studied by S. Saipbaev (1976), M. K. Saralaev, Kh. F. Anarkulov (2003), A. Kasen (2004), A. V. Potanina (1905), S. D. Shagdarov and B. D. Ochirov (1909) and others, their work shows the influence of natural, climatic, geographical, industrial and other features on social pattern, culture and language of the people.

There are many national outdoor games based on the purposeful development of intelligence, training of various physical qualities, transmission of important information, and information about the game world, intelligently focused on the child's education. All they develop and stimulate beneficiation of creative potential and child's imagination.

Research Objective

Develop technologies of health formation and improvement of performance of cardiovascular system in the preschool period by method of ethnopedagogical schools of Kyrgyz people for children of midlands of Kyrgyzstan.

Research Tasks

1. Explore the features of cardiovascular system of preschool children of 5-6 years old, engaged in national outdoor games, who are permanent residents of the midlands.
2. Study the effectiveness of techniques of ethnopedagogical schools and conduct a comparative analysis of indicators of cardiovascular system using ethnic means and methods of influence in the age period of 5-6 years.

Organization and Subject of Research

To obtain consent of preschool institution and fulfillment of their requirements:

- For provision of search results,
- For provision of summaries of lessons on national outdoor games,
- Training of teachers and educators for carrying out of national outdoor games.

To obtain consent of parents and provision of research results:

We examined 80 children, first group - children who are not engaged in national outdoor games, consisted of 40 children (20 - boys 20 - girls), second group - children who are engaged in national outdoor games, consisted 40 children - (20 boys 20 - girls).

The task of the research consisted of a selection and experimental check of the effectiveness of application of national outdoor games and their influence on cardiovascular system.

At the first stage (2009-2010) parameters of physical load in form of national outdoor games, causing the development of cardiovascular system and formation of motor skills were determined: a database of national games were created, summary plan of lessons on national outdoor games for development of cardiovascular system was developed.

Database of national games for preschoolers consists of 69 games, which, we believe, will be most optimally meet the objectives of our study. They are subdivided into: mental (sensory, intellectual) - 20, for physical development and physical qualities – 31, finger - 13; games on breathing - 5. At the second stage (2010-2011)

- measurements aimed at determining the state of cardiovascular system of children not engaged in the national outdoor games were made.

- measurements aimed at determining the effectiveness of the proposed methodology of national outdoor games in the group of children engaged in national outdoor games were made.

The research was conducted on the base of "Bytkombinat" kindergarten and kindergarten Np. 3. of Ananevo village, Issyk-Kul region, Issyk-Kul oblast.

Age of children five - six years (older, the preparatory group).

Children engaged in national outdoor games with the help of physical training instructor 3 times a week played the following games: ("Chybyk-at 1" (stick-horse), Chybyk-at 2 (playing in horse) Baldardyn At Oyunu (hobby), At oyun (horse game), Baldardyn At ustundo oodarysh, Kar atyshmay (snowball), Kesedegi suunu tokpoi alyp keluu (bring water in a bowl not spilling), Suunu tash menen urup chachyratuu (sprinkling the water with a stone) , Ailan kochok (water beetle) , Aylanmay (whirling) , Bat oturmay zhana turmay (fast rising and squatting) ,

Buttun manzhasynda turmay (getting up on your toes) , Zhormoloo (movement on all fours), Monkuu or oturup zhylu (movement sitting), Ordok bysash (movement in a crouch stand) , Zhuruu (walking), Iiz kumai (walking and running on the heels), Aybanattardyn kyymylyn tuuramay (imitation of animals), Jash baldardyn zharyshy (children's race) , Kol karmashyp zhuguruu (running with join hands) and others .

Children who are not engaged in national outdoor games studied according to kindergarten program - carried out walks

Duration of lessons in the older, preparatory groups of children of 5-6 years old is 30-35 minutes.

Research Methods

In accordance with the stated aims and objectives, the study used the following research methods:

Medicobiologic Research Methods

- physiometry (arterial tension, cardiac rate);
- controlled activity test (Martin-Kushelevsky test);

Mathematical and Statistical Methods

- arithmetic middling;
- standard deviation;
- coefficient of variation;
- error of arithmetic middling;

Evaluation of the reliability of the difference between homogeneous indicators was carried out on the critical value of the Student's t-test. For this purpose, T-actual and number of degrees of freedom were calculated.

Results

In the study, we also recorded performance of the cardiovascular system. Heart rate at rest of boys not engaged in national outdoor games (NOG) is equal to $95,0 \pm 0,6$ BPM, and cardiac rate of boys engaged in National Outdoor Games is $91,3 \pm 0,4$ BPM, which is significantly lower by 3.7 BPM ($P < 0.001$) (Table I).

Table I: Indicators of Cardiovascular System of Children of 5-6 Years Old in Terms of Midlands $M \pm M$

Number of children (n)	Cardiac rate (BPM)	Arterial tension (mm hg)		Cardiac rate (BPM)	Arterial tension (mm hg)	
		Systolic pressure	Diastolic pressure		Systolic pressure	Diastolic pressure
Boys				Girls		
not engaged in NOG						
40	$95,0 \pm 0,6$	$94,8 \pm 1,6$	$60,5 \pm 0,8$	$96,3 \pm 0,9$	$98,4 \pm 1,2$	$59,9 \pm 1,8$
engaged in NOG						
40	$91,3 \pm 0,4^{***}$	$96,9 \pm 1,2$	$61,2 \pm 0,9$	$92,5 \pm 0,6^{**}$	$96,2 \pm 1,2$	$60,6 \pm 1,3$

Note: ** - accurate at ($P < 0,01$); ***- accurate at ($P < 0,001$).

The girls, who are not engaged in national outdoor games, have the heart rate $96,3 \pm 0,9$ BPM, and who are engaged have $92,5 \pm 0,6$ BPM, which is lower by 3.8 BPM ($P < 0.01$).

Systolic blood pressure (SBP) of boys who are not engaged and engaged in national outdoor games ranges from $94,8 \pm 1,6$ - $96,9 \pm 1,2$ mm hg, which is slightly higher of those who are engaged in national outdoor games. Girls' systolic blood pressure is $98,4 \pm 1,2$ and $96,2 \pm 1,2$ mm Hg, there has been some decline of indicators of those who are engaged in national outdoor games. In terms of diastolic blood pressure (DBP) boys who are not engaged in national outdoor games have $60,5 \pm 0,8$ mm Hg, and who are engaged have $61,2 \pm 0,9$ mm Hg, and there is a slight increase. Diastolic blood pressure of the girls who are not engaged in national outdoor games is $59,9 \pm 1,8$ mm Hg, and of those who are engaged in national outdoor games is $60,6 \pm 1,3$ mm Hg.

Indicators of heart rate of boys when performing sprint for 120m/sec presented in Table II. Heart rate of boys who are not engaged in national outdoor games at rest is $95,0 \pm 0,6$ BPM, after load was $140,0 \pm 0,6$ BPM, which is significantly higher by 45 BPM at $P < 0.001$.

Recovery occurred in the fifth minute. Heart rate of boys engaged in national outdoor games after exercise increased by 35.2 BPM, and of girls was 36.3 BPM, respectively, which was significantly higher at $P < 0.001$; recovery occurred in the third minute of rest.

Table II: Indicators of Heart Rate at Rest and At the Controlled Activity of Children of 5-6 Years Old of In Conditions of Midlands M±M

Number of children (n)	Race for 120 m/s		Recovery				
	Rest	Load	1 min	2 min	3 min	4 min	5 min
Boys							
not engaged in NOG							
20	95,0±0,6	140,0±0,6***	131,3±0,4***	122,5±0,6***	113,8±0,9***	102,5±0,9*	95,3±0,4
engaged in NOG							
20	91,3±0,4	126,5±0,9***	119,8±0,9***	103,8±0,9**	91,3±1,0	91,3±0,9	91±0,1
Girls							
not engaged in NOG							
20	96,3±0,9	142,5±0,6***	132,5±0,6***	125,0±1,1***	116,3±0,9***	105,0±1,1*	96,8±0,9
engaged in NOG							
20	92,5±0,6	128,8±0,4***	116,3±0,4***	107,5±0,6**	92,3±0,4	92,3±1,0	92±0,6

Note: *- accurate at ($P < 0,05$); ** - accurate at ($P < 0,01$); ***- accurate at ($P < 0,001$).

Indicators of cardiac rate of girls not engaged in national outdoor games is 96,3±0,9 BPM, after performance of exercises was 142,5±0,6 BPM, which by 46,2 BPM is higher that at $P < 0,001$. Recovery occurred in the fifth minute. Thus heart rate at rest of both boys and girls in authentic at children engaged in national outdoor games ($P < 0,01$, $P < 0,001$). In terms of blood pressure, its slight increase was observed.

There is a clear pattern of increasing heart rate of children who are not involved in national outdoor games after the exercises. Consequently, children who are not engaged in national outdoor games the system of "heart-vessels" at rest functions coordinately, but less effectively than of children engaged in national outdoor games. Indicators of heart rate at rest and after exercise indicate a more economic operation of hearts of children engaged in national outdoor games and stress of regulatory mechanisms of children not engaged in national outdoor games.

Regulation of activity of cardiovascular system of children has its own characteristics, which are caused by insufficient regulation of cortical perfect, especially at an early age, as well as the low tone of the vagus nerve center.

Children of tender age have dominated sympathetic influence, from 3-7 years old they gradually weaken and already noticeable influence of the vagus nerve appears, which finds its expression in a well noticeable of sinus arrhythmia and slowing heart rate (I. A. Arshavskii, 1967, S.B. Dogadkina, 2008).

The reaction of children of tender age is assessed as favorable, if, immediately after exercise heart rate increase occurs by 15-20% in relation to the initial, time of recovery should not exceed 2-3 minutes (Keneman A.V, D.V. Khukhlaeva, 1985). In tests for determination of heart rate during physical activity is based on the fact that under the work same in power trained individuals' pulse quickens to a lesser extent, than pulse of untrained individuals (S.B. Tikhvinskii, S.V. Khrushchev, 1991).

Discussion

National outdoor games are a traditional means of teaching. Since the dawn of time, they clearly reflect the lifestyle of people, their life, work, national foundations, notions of honor, courage, spirit, desire to possess the strength, agility, endurance, speed and beauty of movement, to show headpiece, patience, creative fiction, resourcefulness, will and desire to win.

Many scientists noted that "national characteristics, genetic and social, personal habits, lifestyle has a very significant impact on physical development and motor preparedness of people."

Determining in a child's development is primarily considered to be its direct communication with parents and grandparents, which can not be replaced by the most modern computer. Today, we often turn to the experience of our ancestors, to the origins of the national education and training, as this is where we find the answers to many difficult questions of the present. It becomes clear that only interaction of generations (of three) can properly carry out education and development of children, especially of young children. Wisdom of public education as historically proven experience must be foundation for modern teaching and educational systems.

The game is the first activity, which owns a large role in shaping the personality. In games, children reflect the gained experiences, deepen and consolidate their understanding of the depicted events of life. Child as an adult knows the world during the activity. Engaging in games enrich participants with new sensations, ideas and concepts. Games expand range of ideas, develop observation, intelligence, ability to analyze, compare and summarize the things they see, and on this basis draw conclusions from the observed phenomena in the environment. The outdoor games develop the ability to correctly assess spatial and temporal relationships, quickly and properly respond to the situation in frequently changing environment of game.

The value of outdoor games in the education of physical qualities is also great: speed, agility, strength, endurance, flexibility. Games bring in children a sense of solidarity, partnership and responsibility for each other's action. Rules of game contribute to education of conscious discipline, honesty, endurance, ability to "pull themselves together" after strong excitation, and to restrain their selfish impulses.

Such widespread use of national outdoor games ensures their preservation and transmission from generation to generation.

Game is one of those kinds of children's activities that are used by adults for the purpose of education of preschool children, teaching them various actions with objects, methods and means of communication (N.E. Chernoiivanova, 2009).

As was noted by several authors S.L. Novoselov, 1989; Kh.F. Anarkulov, 2003, Kyrgyz national games and physical exercises develop a child as person, create perception, thinking, intuition, emotion, memory, language, aesthetic perception, moral feelings, improve feelings, and learn to make independent decisions. Development of game involves substantial progressive changes in the child's mind, and, above all, in his intellectual sphere, which is the foundation for development of all other parts to the child's personality. Psychologists study shows how emotions, experiences of gaming events, lofty games motives are significant (A. V. Zaporozhets, Ia. Z. Neverovich, T. P. Khrizman and other, 1986). Emotions harden a game, make it exciting, create a favorable climate for relationships, increase vitality, which is required for each child for his peace of mind, and this, in turn, becomes a condition of susceptibility of preschooler to educational influences and joint activities with their counterparts.

The level of development of children's thinking determines the nature of his activities, the intellectual level of its implementation. The success of transmission by society of its culture to the younger generation depends on what kind of content will be invested by the adults in the games proposed to children.

During the preschool period, change of dependence of the motor activity and physical fitness of children from their physical development happen: physical development has a leading role in functional improvement of organism of children in junior preschool age (3-4 years old), and in senior preschool age (5-7 years old) this role is reduced, but it still remains a significant and role of physical fitness increases, which increases the importance of active pedagogical influence in process of physical education (A. V. Keneman, D. V. Khukhlaeva, 1985; Iu. K. Chernyshenko, B. A. Balandin, B. F. Kurdiukov, 1999; W. Mechelen et al., 2000).

In the process of improvement of physical fitness, the efficiency of the cardiovascular system and ventilation system increases, power of aerobic and anaerobic energy processes expands, formation of arbitrary motor function, optimization of metabolism and increase of muscle strength occurs. At the heart of single-step and long-term physiological changes is the formation of a new level of functioning of the autonomic nervous system (R.M. Baevsky, 1979; M. Gerova, 1991). That is why the state of autonomic regulation is a determining factor in the development process of adaptation to physical stress and binding index for medical monitoring of children in the case of use of alternative methods of physical education.

Systematically influencing on skeletal muscle, exercises significantly activate metabolic processes, create favorable conditions for the supply of all cells and tissues of organism (R.M. Baevskii, A.P. Berseneva, J.V. Barsukov, 1985, V.I. Kuznetsov, 2000).

Habituation and balancing of human to environmental influences is one of the most urgent biomedical problems. Herewith, it should be borne in mind that the activities of such labile systems such as cardiovascular, often becomes a limiting factor to the development of adaptive reactions of growing organism (J. M. Clarke, J. Hamer, J. R. Shelton, 1976; B.T. Turusbekov, 2003) .

Based on the concept of the cardiovascular system as an indicator of biological principles of activity of the whole organism, we should primarily refer to the analysis of heart rate - a universal reaction of the organism in response to any load. Developing organism has a different level of operational readiness to external influences at different stages. Preschool age is intense period in the development of the cardiovascular system, especially of boys of 6-7 years old, which must be considered when hygienic standardization of activities for children (E.A. Aksyanova, M.A. Syrtova, 1990; A.S. Solodkov. E. M. Esina, 1997; G.P. Yurko, 1966).

From the foregoing it can be concluded that the game is one of the most important means of physical education of children of any age. It promotes physical, mental, moral and aesthetic development of the child. Variety of movements and actions of children during the game, with skilful guidance, effectively influence the activity of the cardiovascular and respiratory systems, help to strengthen the nervous system, musculoskeletal system, improve the overall metabolism, increase the activity of all organs and systems of the human body, stimulate the appetite and promote sound sleep. With the help of mobile games a comprehensive physical development of the child is provided. It was also observed that during the game pupils form and improve basic skills in a variety of movements (running, jumping, throwing, climbing, etc.) Quick change of scenery in the game teaches the child to use his famous movement in accordance with a particular situation. All this has a positive effect on improving motor skills.

Conclusions

Fluctuations of heart rate in the group engaged in the national outdoor games are 91.3 BPM, in the group not engaged in national outdoor games - 95.0 BPM. Average rates of heart rate, blood pressure and variability of these changes in these parameters of children not engaged and engaged in national outdoor games were defined.

- At rest, variation of indicators on heart rate and blood pressure has significant differences by sex and age, at the same time, heart rate after national outdoor games has significant differences.

- Samples with controlled muscle activity of boys and girls engaged in national outdoor games cause an increase in the average spread of indicators to 35,3-36,3 BPM at an average, in the group not engaged in national outdoor games 45-46,2 BPM. Recovery time after exercise of children engaged in national outdoor games is 3 minutes; while of children not engaged in national outdoor games is 5.0 minutes. Normotonic type of reaction to exercise is observed.

Constant use of national outdoor games for children of 5-6 years old engaged in national outdoor games removes occurred lack of sustained dynamics of development of functional capabilities, harmonizes the development of motor and cardiovascular system.

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