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Influence of outdoor games on functional condition of the respiratory system at girls of the younger school age

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Purpose: *to study influence of outdoor games on functional condition of the respiratory system of girls of the younger school age in the groups of 6–8 and 9–10 years old.*

Material & Methods: *the problem of functional condition of external breath at girls of the younger school age (in the age groups of 6–8 and 9–10 years old), who were divided into the control group (CG) in number of 32persons (CS No. 58) and the experimental (EG) in number of 29 persons (OTEC No. 109) of Zaporozhe, is considered.*

Results: *it is defined that the studied girls of both groups at the beginning of the research had mainly below average and average levels of functional condition of the system of external breath.*

Conclusions: *the effective impact of outdoor games on functional condition of the whole organism in general and on the system of external breath, in particular, at girls of the experimental group in comparison with the studied girls of the same age of the control group is proved experimentally. Application of the large number of various outdoor games allowed diversifying the program of training at physical education classes emotionally and physically, than promoted the activation of functions of the whole organism of girls of the younger school age.*

Keywords: *respiratory system, outdoor games, younger pupils, girls.*

Introduction

The problem of health of younger pupils is modern and stands acutely for specialists in various fields: medicine, pedagogy, physiology, school staff, and specialists in physical education, rehabilitologists and so on. Researchers E. Vilchkovsky, O. Dubogay, N. Khomenko [3; 9] noted that one of the crises phenomenon of traditional and author education systems is the gap between physical education and all other forms of educational activities for children of younger school age, the lack of real mechanisms that determine the relationship of cognitive and motor activity in the learning process. The essence of this interaction is the formation of learning system that provides integrated, educational, health, general educational effect, which is the key to optimum mental and physical development of the child, which is currently the most urgent. This approach finds its place in the organization of educational work in the comprehensive school.

Psychologists, educators and psychologists came to the conclusion that individual abilities (thinking, perception, representation) should not be considered in isolation, without the context of the motor development of the child. So, O. Dubogay, B. Pangelov, Frolova, M. Gorbunko believe that the optimal conditions of existence and development of children's abilities during their studies is the joint game activity, socializing with other children, during which the child is not only moving, but also easily keeps in mind all heard in this period [6].

The need in movement is a very strong for the younger pupils. They cannot sit in class immovably. Such need appears especially on breaks. Therefore it is necessary to provide children with an opportunity to move more. L. Bozhovych, one of the outstanding teachers of the past, pointing to the increased need of younger pupils in the movement, called for organizing the pedagogical process so as to meet the needs of children in motion by introducing it in the framework of meaningful, pedagogically justifiable forms [1].

Outdoor games – one of the complex means of physical education, which has a recreational, training and educational value. T. Krutsevich and M. Koleman considered that the younger school age – is the most favorable time for inclusion of outdoor games in the education process [8; 11].

The change in the authoritarian discipline model of personality-oriented, which is provided that the National doctrine of education development in Ukraine, is the priority of the modern state policy in the development of education in Ukraine. Its essential feature is learning and education of the person with the maximum individualization, creating favorable conditions for self-development and self-identity, meaningful definition of opportunities and life aims, education closer to pressing social needs. The problem of human health, which goes from the plane of the private individual case into the category of socially significant problems, is particularly urgent at the beginning of the third millennium [2; 4].

H. Shchavel, T. Mykhats, Yu. Svystun studied influence of outdoor games on the functionality of children of the secondary school age [10]. The relevance of this study lies in the fact that the information, which would be concerned the study of the effect of outdoor games on the functional state of the respiratory system of the body of girls of the primary school age is insufficient, and it therefore became the subject

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of our research.

The purpose of the research:

to learn the impact of outdoor games on the functional state of the respiratory system of girls of the younger school age in the groups of 6–8 and 9–10 years old.

Research tasks:

– to determine the functional state of the respiratory system of the body of girls of the younger school age;
– to evaluate the impact of outdoor games on the functional state of the system of external breathing of girls of the studied groups.

Material and Methods of the research

The following *methods of the research* we used to obtain and analyze the results*:*

1. Theoretical analysis and compilation of scientific methodical and special literature.
2. Pedagogical experiment.
3. Biomedical research methods and functional tests for the determination of the main indicators of external respiration (HR, spirometry, hypoxia index, index of Skibinskyi, RFS seb).

All received results in the course of the study were processed by methods of mathematical statistics. We determined the arithmetic mean ($\bar{X}$), the mistake of the arithmetic mean (m) during the experiment. The comparison of groups was performed using the criteria of Student (t) for determining the validity of the discrepancies between indicators in two groups of girls (control and experimental).

Results of the research and their discussion

The research was carried out in two steps: the stated experiment (2011–2013) during which the analysis of literature was carried out and indicators of the system of external breath at children of the younger school age were studied, physical education program at school was studied. At the second stage – the forming experiment, was conducted with girls by the developed technique, which contained the large number of various outdoor games for day and at physical education classes.

Girls of 6–8 and 9–10 years old of the younger school link participated in the research. They were divided into the control group (CG) in number of 32 persons and the experimental group (EG), numbering 29 persons. At the beginning of the experiment researches all girls were subjected to the research by all indicators, which were chosen by us, which display functional condition of the system of external breath (in tables – the beginning of experiment). Further the control group worked according to the usual school program on physical culture at school (3 physical education classes with the modular system of study), and we developed for the experimental group and introduced the program which contained in form, direction, contents, complexity of outdoor games, large number of various physical education classes. Loadings were accurately dosed, the lesson consisted of preparatory, main and final parts with fixing of pulse curve, the attention was paid to external developments of fatigue. Loadings were set wavy for renewal and gradual activization of processes of breath. Active games changed less motive during the classes. It is necessary to notice that loading were chosen according to the principles of the theory of physical education and study at school for girls of the younger school age. The level of physical fitness and developed functional systems of organism at the studied girls was considered in

Table 1

Indicators of the system of external breath at girls of 6–8 and 9–10 years old of control and experimental groups at the beginning of the forming experiment, $\bar{X}$±m

Indicators	Girls of 6–8 years old		Girls of 9–10 years old	
	CG	EG	CG	EG
VCL, ml	1781,00±21,73	1823,25±19,5	1781,00±18,95	1823,25±25,53
Tinh, s	40,43±1,40	42,84±1,31	49,01±1,04	46,74±1,36
Texh, s	20,93±0,69	22,69±0,82	23,47±0,79	25,74±1,61
IH, s.u.	0,24±0,01	0,25±0,01	0,30±0,01	0,33±0,02
Isk, s.u.	823,26±31,28	871,90±27,60	1096,01±29,48	1096,92±37,60
RFS seb, s.u.	59,90±1,40	62,30±1,18	62,95±1,21	64,78±1,17

Table 2

Indicators of the system of external breath at girls of the experimental group of 6–8 years old at the beginning and at the end of the forming experiment, $\bar{X}$±m

Indicators	Beginning	End	t
VCL, ml	1823,25±19,50	1998,75±23,79	**3,38**
Tinh, s	42,84±1,31	48,36±1,03	**4,44**
Texh, s	22,69±0,82	27,63±0,75	**7,20**
IH, s.u.	0,25±0,01	0,33±0,01	**9,90**
Isk, s.u.	871,90±27,60	1153,57±32,61	**11,25**
RFS seb, s.u.	62,30±1,18	71,71±1,36	**4,50**

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selection of games. The main task was not to do much harm to health, and to promote to the development of functional condition of organism in general and especially, the system of external breath.

Our researches leaned on the modern researches of scientists which work with the problem of the research and formation of health of children. L. Deminska and F. Zaynulin note the special concern is caused by the state of health of modern children [5; 7]. Their data of statistics demonstrate that every third child has various deviations at the accession to school in the state of health, and until the end of study – every second.

We decided to investigate the system of external breath at girls of the younger school age in the context of this research.

So, we obtained the data at the stage of the stated experiment which confirm mainly average and below average levels of the functional development of the system of external breath in younger pupils.

The shown data confirm the lack of statistical divergences at the beginning of the research between the groups of different age of the investigated of the control group (CG) and the experimental group (EG), therefore with girls it was possible to conduct the subsequent researches and to compare them among themselves further at the end of the experiment research and to introduce the technique of formation, which was chosen on the basis of application of outdoor games and functional development of the system of external breath in girls of the younger school age.

The data of the given below tables 2 and 3 demonstrate to the fact that the system of external breath is subject to the correction and gives in to the development in a year of methodically correctly selected and systematically applied outdoor games at girls of the experimental group at physical education classes at school.

All studied indicators at girls of the experimental group have got the reliable improvement in comparison with the beginning of the experiment researches that cannot be told about the studied contingent of the control group.

The reliable improvements took place only in indicator of the Index of Skibinskyi in control group. The gain is statistically not reliable and fluctuates ranging from 0,1% to 9,7% on the group of 6–8 years old and at girls of the age category of 9–10 years is ranging from 2,7 to 9,1% in all other studied indicators at girls of the control group.

Results of the research of dynamics of the development of functional condition of the system of external breath at girls of control and experimental groups during the research showed that high-quality and quantitative changes took place in the experimental group on all studied indicators and the difference in indicators varies ranging from 9,2% to 27,7% (tab. 4) in the group of 6–8 years old and from 2,7% to 9,14% at the age of 9–10 years (tab. 5).

The submitted data of tables and the analysis of scientifically methodical literature allow to draw the following conclusions and to define the subsequent course of the scientific-experimental researches and searches.

Conclusions

Results of the conducted researches in control and experimental groups testify to the uniformity of groups and the lack of essential divergences in indicators at the beginning of the experimental research, therefore the subsequent results in changes of their functional condition of the system of external breath had a statistically reliable character. 29,4% of girls of both groups had the low level of functional condition of the system of external breath and below the average of 70,6% of girls of the younger school age of both groups at the beginning of the research.

During the research authentically positive changes in organism of younger pupils took place on all studied indicators at girls of the experimental group that it cannot be testified about the contingent of the control group. Results of changes in indicators are displayed above in tables and their difference is analyzed above. As for RFSseb, the average level in 58,8% was diagnosed at the end of the research in the control group, and 41,2% of girls had RFSseb above the average. Results of divergences of levels of functional state in the age groups 6–8 and 9–10 of years are not considerable.

Only 18,7% of girls had the average level of functional condition of the system of external breath, and other girls – 81,3% had above the average in the experimental group among girls of 6–8 years old. Concerning the age group of 9–10 years, here there were no levels below the average and average, and 93,3% of girls had level above the average, one girl had the high level that has made 6,7% of the investigated at the end of the research in general.

The researches prove that the functional system of external breath is subject to the correction and the development and can work more effectively in organism of younger pupils in one year after introduction of the systematic program of classes

Table 3

Indicators of the system of external breath at girls of the experimental group of 9–10 years old at the beginning and at the end of the forming experiment, $\bar{X}$±m

Indicators	Beginning	End	t
VCL, ml	1823,25±25,53	1985,75±35,11	**3,74**
Tinh, s	46,74±1,36	51,16±0,84	**2,76**
Texh, s	25,74±1,61	30,03±1,40	**2,01**
IH, s.u.	0,33±0,02	0,41±0,02	**2,99**
Isk, s.u.	1096,92±37,60	1393,71±30,38	**6,14**
RFS seb, s.u.	64,78±1,17	74,30±1,34	**5,36**

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Table 4

Indicators of the system of external breath at girls of 6–8 years old of control and experimental groups at the end of the forming experiment

Indicators	CG, $\bar{X}$±m	EG, $\bar{X}$±m	t	%
VCL, ml	1829,75±17,72	1998,75±23,79	**5,71**	9,24
Tinh, s	42,38±1,16	48,36±1,03	**3,32**	14,11
Texh, s	22,43±0,78	27,63±0,75	**4,43**	23,18
IH, s.u.	0,26±0,01	0,33±0,01	**5,49**	26,92
Isk, s.u.	903,29±24,84	1153,57±32,61	**6,59**	27,71
RFS seb, s.u.	63,26±1,48	71,71±1,36	**5,23**	13,36

Table 5

Indicators of the system of external breath at girls of 9–10 years old of control and experimental groups at the end of the forming experiment

Indicators	CG, $\bar{X}$±m	EG, $\bar{X}$±m	t	%
VCL, ml	1829,75±21,21	1985,75±35,11	**2,72**	8,52
Tinh, s	50,64±0,71	51,16±0,84	**3,64**	1,03
Texh, s	24,77±0,83	30,03±1,40	**5,68**	21,24
IH, s.u.	0,32±0,01	0,41±0,02	**8,38**	28,13
Isk, s.u.	1196,16±20,43	1393,71±30,38	**10,12**	16,52
RFSseb, s.u.	65,23±1,26	74,30±1,34	**5,29**	13,90

with the dosed outdoor games during the school day which leads up expediency of use of such type of the increase in physical activity for girls of the younger school age.

It should be noted that physical culture classes at school promote the slight increase, or the stabilization of functional condition of the system of external breath of girls (by results of the research in the control group), but more considerable and statistically reliable improvements in the system of external breath happen in organism of girls of the experimental group thanks to introduction of the systematic, dosed, individually selected and held in the interactive and emotionally charged mode of outdoor games.

The results, which are presented in tables and received during the research according to the level of development of functional condition of the system of external breath at girls of the younger school age demonstrate the effective influence of outdoor games on functional condition of all organism in general and on the system of external breath in particular at girls of the experimental group, in comparison with the investigated of the same age of the control group. Applications of large number of outdoor games allowed to diversify emotionally and physically the program of study on physical culture, than promote the activation of functions of all organism of girls of the younger school age.

We plan to direct the subsequent researches to studying of the functional system of external breath of boys of this age which will allow to define the expediency of complex application of the chosen program of outdoor games during the school day for the increase in functional condition of the system of external breath of younger pupils of both gender groups at the same time.

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