PECULIARITIES OF PHYSICAL DEVELOPMENT OF CHILDREN BROUGHT UP IN PRESCHOOL EDUCATIONAL ORGANISATIONS OF DIFFERENT TYPES OF STRUCTURE

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Abstract. *Collecting data on children's physical development, such as height, weight and other indicators, helps us take action to support their health and development. TIn addition, they help solve problems with physical development by offering appropriate recommendations and measures. For preschool organizations, this data is important for informed decisions and the development of child support programs.*

Keywords: *children, physical development, pre-school educational organisations.*

Introduction. The physical development of children is one of the most important indicators of their overall health [3]. From birth to full adulthood, a child's body goes through many stages of intensive growth and development, and during this period it is particularly sensitive to environmental and external factors [5].

The environment plays an important role in children's physical development [1]. Pre-school educational organisations (PSEs) are the place where children have to move away from home for the first time and get used to a new place. The environment in preschool educational organisations plays a significant role in children's physical development and is key to preschoolers' health and all-round development [4].

Russian scientists have conducted a study to examine the adaptation capabilities of children's organism. The study showed that 54.3% of boys and 56.1% of girls had satisfactory levels of adaptation. However, 45.7 per cent of boys and 43.9 per cent of girls had strained adaptation and unsatisfactory adaptation. This indicates that these children have difficulties in adapting to their environment [2].

It is therefore important to create and maintain a favourable environment that helps children adjust to their new place and develop harmoniously. This study was conducted to investigate the impact of the material used to build preschool educational organisations on children's physical development. The results of the study are of practical significance for making decisions on the construction and reconstruction of preschool institutions, as well as for creating an optimal environment for children's development and learning. Research objective. The main purpose of this study was to find out which type of material in preschools has the most positive effect on children's physical development. This may be useful information for the construction and development of new preschools, as well as for organisations renovating existing facilities. The study can help to identify the optimal environment and conditions for children's development, providing them with the best opportunities for physical growth and development.

Research methods and material. The objects of the study were PSEs built of different building materials. Three types of PSEs were selected: metal structure, reinforced concrete and brick. The study participants were 474 children aged 4-6 years, including 231 boys (48.7%) and

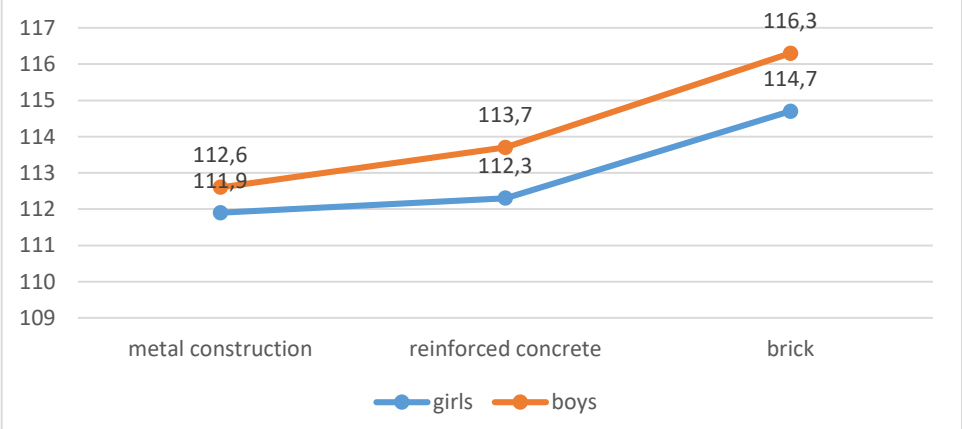
243 girls (51.3%). Of these, 39.9 per cent of the children attended PSEs constructed of brick, 34.2 per cent of reinforced concrete and 25.9 per cent of light metal construction. Various research methods were used to collect data, including hygienic, somatometric, medico-statistical and analytical methods. To carry out anthropometric study of children, a method developed by Kamilova R.T. was used, entitled "Unified Methodology for the Study and Assessment of Physical Development of Children and Adolescents" (Monograph. Tashkent - 1996). This methodology of Kamilova R.T. is one of the most widely used in the field of anthropometry. It involves measurements of various anthropometric parameters such as height, weight, chest circumference and volumes of various body parts. Anthropometric studies of children were conducted with the participation of preschoolers' carers, which allowed creating a comfortable and trusting atmosphere for children.

For statistical processing of the data we used Microsoft Excel 2016 programmes, which provide the necessary tools and functions for various statistical calculations. During the analysis, we calculated arithmetic mean (M), error of mean (m) and standard deviation value (σ). To further analyse the differences between two independent samples, we used Student's t-test to determine whether the differences between the mean values of two independent samples are significant. In this study, the level of statistical significance was set as $p \leq 0.05$, which means that differences between groups of data were considered reliable if the probability of random differences was less than 5%. The methodology for assessing the physical development of preschool children was based on the recommendations presented in the publication entitled "Assessment of physical development and nutritional status of children in Uzbekistan", which was edited by Kamilova R.T. in 2018. This methodological recommendation served as a basis for determining the parameters and criteria by which children's physical development was measured and assessed. The results of the study allow us to assess the differences between PSEs based on different construction materials and their impact on children's physical development.

Research results. The results The study revealed that 6-year-old boys attending brick PSEs had a body length of 116.3±0.69 cm, reinforced concrete - 113.7±1.12 cm, and metal construction - 112.6±1.23 cm. Boys attending brick PSEs had significantly ($p<0.05$) longer body lengths (3.7 and 2.6 cm) than children in metal and reinforced concrete PSEs. Similar results were obtained for girls. Girls 6 years old who are brought up in brick PSEs have (114.7±0.81 cm) significantly ($p<0.05$) 2.8 cm longer than in metal PSEs (111.9±1.09 cm), and compared to reinforced concrete PSEs (112.3±0.93 cm) 2.4 cm longer (figure 1).

Figure 1

Average body length in children 4-6 years old



Let us consider the data obtained on torso length in 4-year-old girls in brick PSEs had a value of 31.8±0.39 cm, in metal construction children - 32.0±0.74 cm, and in reinforced concrete children - 31.7±0.32 cm. Among 5 years old girls brought up in brick PSEs the torso length averaged 33.1±0.83 cm, in metal structures - 33.8±0.49 cm and in reinforced concrete - 32.5±0.61 cm. But no significant difference was found between the groups. However, 6 years old girls brought up in brick PSEs had significantly ($p \leq 0.05$) longer torso length (36.1±0.34) compared to metal structures (35.1±0.43 cm) and reinforced concrete PSEs (34.2±0.43 cm) (table 1).

Table 1

Body and torso length indicators of children aged 4-6 years (M±m)

Indicators	Body length			Torso length		
PSEs	MC	RC	B	MC	RC	B
Age	girls					
4 yrs.	99,0±1,18	98,9±0,75	99,1±0,94	32,0±0,74	31,7±0,32	31,8±0,39
5 yrs.	105,1±1,17	105,0±1,12	104,7±1,24	33,8±0,49	32,5±0,61	33,1±0,83
6 yrs.	111,9±1,09	112,3±0,93	114,7±0,81 *	35,1±0,43	34,2±0,43	36,1±0,34** **
boys						
4 yrs.	102,0±0,51	102,8±0,72	101,0±0,79	32,3±0,37	32,2±0,44	32,4±0,60
5 yrs.	107,2±0,88	106,7±0,84	107,8±1,00	34,7±0,46	33,5±0,32*	34,8±0,44*
6 yrs.	112,6±1,23 *	113,7±1,12	116,3±0,69 *	35,3±0,75	35,1±0,61	37,5±0,30** *

*Note: * - statistically significant correlations ($p \leq 0.05$); ** - statistically significant correlations ($p \leq 0.01$); *** - statistically significant correlations ($p \leq 0.001$); MC-metal structure, B-brick, RC-reinforced concrete*

Similar results are observed when measuring the length of the upper limb. 6-year-old girls raised in brick PSEs have a significantly longer upper limb length, 46.3±0.41, compared to metal structures PSEs, 46.2±0.59 cm, and reinforced concrete PSEs, 42.4±0.57 cm. When measuring the length of the lower limb, it is also seen that 6 -year-old girls brought up in brick PSEs are significantly longer - 56.8±0.57 cm - than girls brought up in metal structures (54.9±0.92 cm) and reinforced concrete (57.4±0.62 cm) PSEs, but no significant difference was found (table 2).

Table 2

Upper and lower limb lengths of girls aged 4-6 years (M±m)

Indicators	Upper limb length			Lower limb length		
PSEs	MC	RC	B	MC	RC	B
Age	girls					
4 yrs.	40,5±0,72	39,5±0,45	39,6±0,49	47,5±1,17	48,3±0,47	46,4±0,81
5 yrs.	41,9±0,56	42,9±0,69	42,3±0,57	51,0±0,72	52,2±0,69	51,2±0,76
6 yrs.	46,2±0,59	42,4±0,57	46,3±0,41 ***	54,9±0,92	57,4±0,62	56,8±0,57

*Note: * - statistically significant correlations (p≤0.05); ** - statistically significant correlations (p≤0.01); *** - statistically significant correlations (p≤0.001); MC-metal structure, B-brick, RC-reinforced concrete*

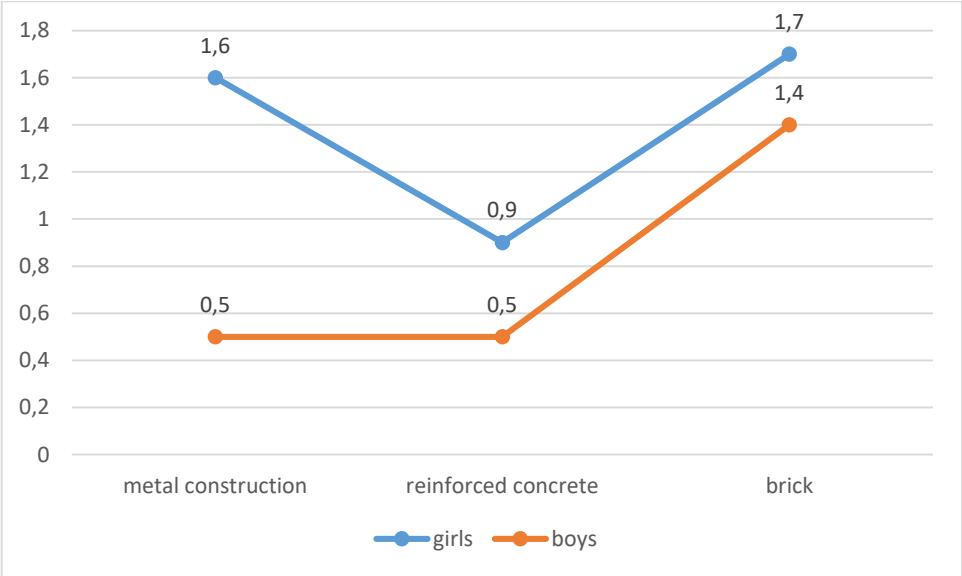
In our study we measured circumference indices such as head, chest, abdomen and hip circumferences.

The head circumference of 6-year-old boys raised in a brick PSEs is (51.8±0.20 cm) significantly (p<0.05) higher by 0.9 cm than boys raised in a metal structures PSEs (50.9±0.26 cm), and compared to boys raised in a reinforced concrete PSEs (51.3±0.44 cm) higher by 0.5 cm. Differences in head circumference growth in girls aged 4 to 6 years have been revealed.

Girls attending metal-constructed PSEs have the largest increase in head circumference, which is 1.6 cm. At the same time, children attending reinforced concrete PSEs have a smaller increase in head circumference, which is only 0.9 cm. Girls attending the brick PSEs have the highest head circumference increase of 1.7 cm (figure 2).

Figure 2

Increase in head circumference in children aged 4-6 years



The obtained data showed that the chest circumferences of boys are significantly (p<0.05) 1-2 cm larger than those of girls in all age groups. Among 6-year-old boys in brick PSEs, the average chest circumference was 57.7±0.39 cm, in reinforced concrete PSEs - 56.6±0.78 cm, and in metal construction PSEs - 56.8±0.61 cm. At the same time, among 6-year-old girls, the mean chest circumference was 56.1±0.43 cm in brick PSEs, 55.9±0.69 cm in reinforced concrete PSEs and 55.0±0.71 cm in metal construction PSEs (table 3).

In the study, it was found that the mean value of abdominal circumference of girls raised in metal construction PSEs is 52.2±0.66 cm. This value is significantly (p≤0.05) higher than that of girls brought up in brick PSEs where the mean abdominal circumference is 49.7±0.66 cm. However, there was no significant difference in the value of abdominal circumference among girls raised in reinforced concrete PSEs, which was 50.3±0.76 cm.

In boys, there was a significant (p≤0.05) difference in abdominal circumference between children in metal and brick PSEs. The mean abdominal circumference of boys in metal construction PSEs was 51.0±0.62 cm, while that of boys in brick PSEs was 53.2±0.63 cm.

Table 3

Head and chest circumference in children aged 4-6 years (M±m)

Indicators	Head circumferences			Chest circumference		
PSEs	MC	RC	B	MC	RC	B
Age			girls			
4 yrs.	48,8±0,49	49,6±0,24	49,2±0,38	51,8±0,51	52,0±0,35 *	50,9±0,35 *
5 yrs.	50,0±0,30	50,0±0,31	49,8±0,34	54,0±0,47 *	53,5±0,65 *	52,4±0,57
6 yrs.	50,4±0,34	50,5±0,26	50,9±0,23	55,0±0,71	55,9±0,69	56,1±0,43
boys						
4 yrs.	50,4±0,32	50,8±0,29	50,4±0,34	53,6±0,53	54,6±0,45	54,1±0,55
5 yrs.	50,4±0,37	50,2±0,29	50,8±0,30	54,0±0,45 *	54,7±0,39 *	55,3±0,48
6 yrs.	50,9±0,26 *	51,3±0,44	51,8±0,20 *	56,8±0,61	56,6±0,78	57,7±0,39

*Note: * - statistically significant correlations (p≤0.05); MK-metal structure, K-brick, RC-reinforced concrete*

However, there was no significant difference in abdominal circumference between boys in metal (51.0±0.62 cm) and reinforced concrete (51.7±0.58 cm) PSEs (table 4).

Table 4

Abdominal circumference in children aged 4-6 years (M±m)

Indicator	Abdominal circumferences					
PSEs	MC	RC	B	MC	RC	B
girls				boys		
4 yrs.	50,4±0,68	50,1±0,50	49,5±0,50	51,3±0,80	52,0±0,64	51,9±0,62
5 yrs.	52,2±0,66*	50,3±0,76	49,7±0,66*	51,0±0,62*	51,7±0,58	53,2±0,63*
6 yrs.	52,1±0,68	53,4±0,73	52,9±0,49	52,8±0,69	53,4±0,90	54,0±0,52

*Note: * - statistically significant correlations (p≤0.05); MK-metal structure, K-brick, RC-reinforced concrete*

Thus, the study showed that children attending brick PSEs had the highest scores and children attending reinforced concrete PSEs had the lowest scores. However, it should be noted that the differences in physical development between the groups were not always reliable.

The study makes it possible to draw important conclusions about the influence of education and upbringing conditions on the development of preschool children. The length of body, torso, upper and lower limbs of 6-year-old children attending brick preschools was significantly greater than that of children attending metal construction and reinforced concrete preschools. Maximum gains in physical development were observed in children attending brick preschools. However, further research is required to clarify the reasons for these differences and to optimise the conditions of education and upbringing of preschool children.

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