

FURTHER IMPROVEMENT OF THE HEALTH OUTCOMES AS WELL AS MOVEMENT ACCURACY FOR PRESCHOOL CHILDREN

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Abstract. Even though the positive impacts of physical activities on the cognitive and physical development of young children is generally acknowledged, there is little emphasis on ensuring appropriate physical educational experiences within the early childhood curriculum. The key purposes of modern physical education in early childhood are to foster not only essential life skills, critical thinking, decision-making skills and analytical competencies but also promote healthy physical development in its learners. Increased movement and physical activity does create healthy habits and improve confidence, self-esteem and emotional skills. Since a shortage of physical activity in early childhood could pose many health problems such as excess body fat, weight gain, high blood pressure and cardiovascular diseases, this article covers the importance of physical education during early childhood. **Keywords:** static and dynamic balance, the Y balance test, pulsometry, the vestibulo chronometry, physical development, nerve fibers.

INTRODUCTION.

From a personal perspective, special attention should be paid to maintaining balance in PE lessons of preschool education institutions. As we know, balance is *the ability to stay upright or stay in control of body movement*. There are two types of balance: *static* and *dynamic*. Static balance is maintaining equilibrium when stationary, while dynamic balance is maintaining equilibrium when moving. The better the balance function, the faster it recovers, the smaller the vibration amplitude, and the more accurate the movement. There are two main ways to cultivate balance. The first one is the use of balance exercises that make it difficult to balance in the different situations. The second is based on the selective improvement of analyzers that ensure the balance of vestibular being not lost, thus, some kinds of exercises with linear and angular accelerations are used to improve vestibular function.

It is customary to form the accuracy of movement on the basis of a traditional methodological approach. For instance, an initial idea is created about the method of teaching *in the first stage* of the teaching process, as explanatory and visual methods are used at this very stage. *In the second stage*, the situation and actions related to the implementation of the methods, that are being taught in normal conditions, are applied.

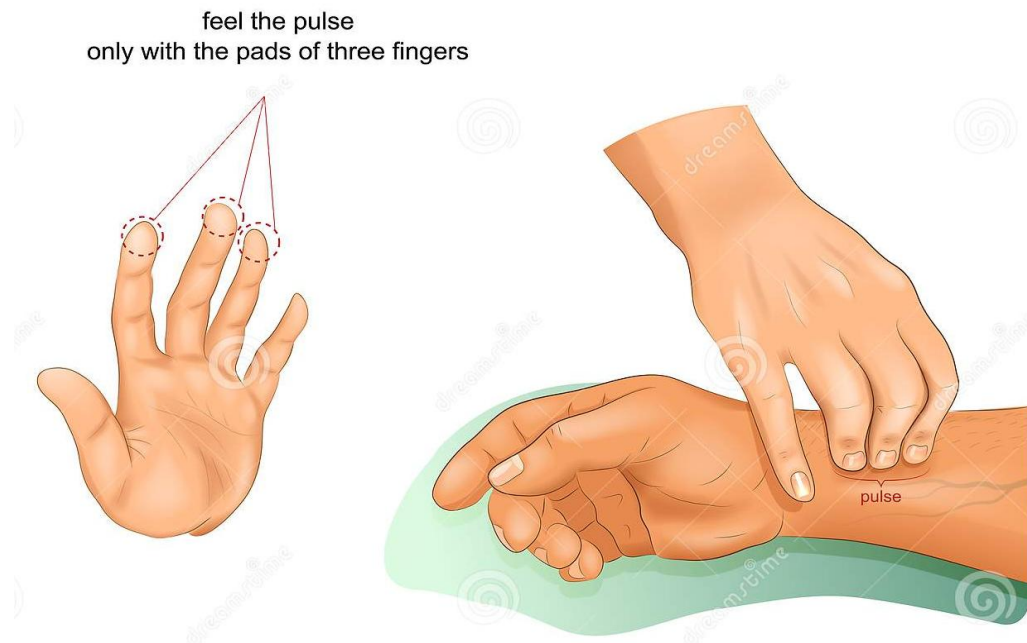
Such movements, *in the third stage*, are complicated in terms of speed, direction, repetition, and accuracy, in other words, the techniques and accuracy of the methods are formed in complex situations. And also, preparatory, accessory, approachable and basic technical exercises are used for various tactical purposes, as well as, it is used to teach methods in parts, phases, elements, fully complicate tasks, apply them in different situations and time intervals at this stage. *In the fourth stage*, the technique, accuracy and speed of the movements are formed and gradually improved on the basis of variable certain exercises, using the methods of repetition, game and competition. Since the technique and accuracy of the movements are enhanced, the complexity of the exercises increases, and their types are applied according to the circumstances of the game.

MATERIALS AND METHODS.

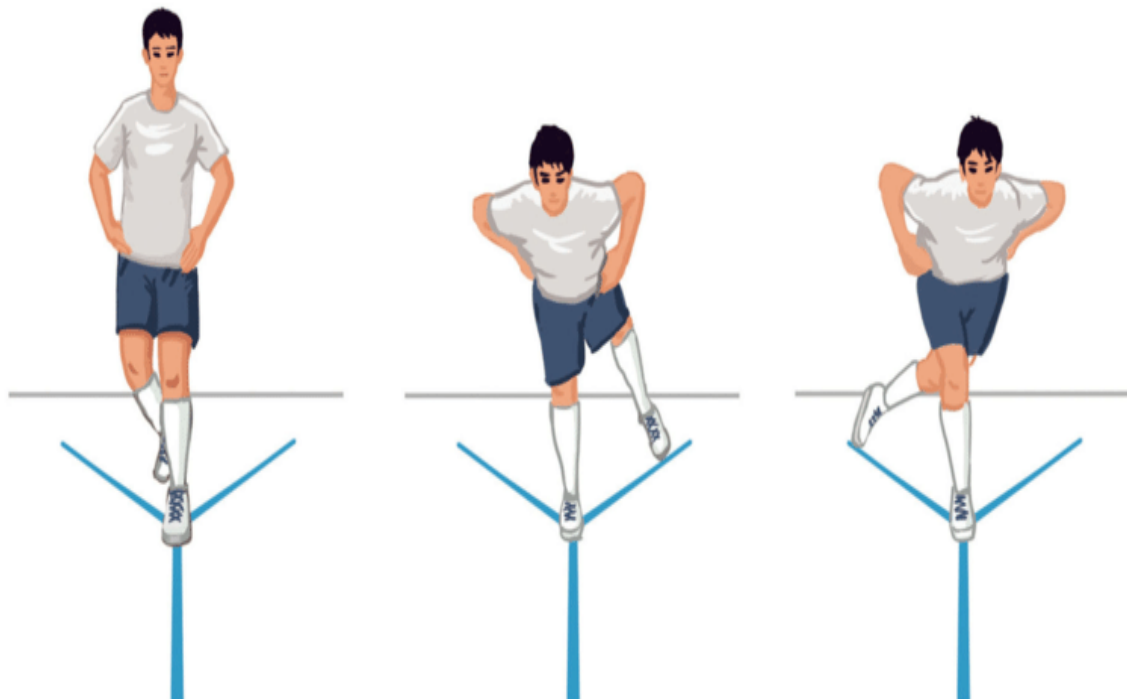
In-depth study of anatomical and physiological facts, mechanisms of action of nerve centers on muscle activities, analysis of the activity of nerve fibers from the afferent center to different receptors, nerve impulses from the vestibular analyzer to various movements, it will be possible to do the study of disappearance movements. Considering all the issues, we carried out an experimental study focused on the accuracy of movements in the preparatory group of children aged 5-6 years in order to know their heart rate, as well as the characteristics and reasons of its attenuation artifact. When it comes to objectives of the research, they are the followings:

- ❖ analysis of scientific and methodological literature on the subject;
- ❖ determine the indicators of physical development of children aged 5-6 years at preschool;
- ❖ conduct pulsometry and Y-balance test.

Research methods such as pedagogical observation, surveys, interviews, analysis of scientific and methodological literatures, pedagogical testing and mathematical statistics were used in the implementation of research. As you know, the heart rate per minute is calculated using **Pulsometry**. This test is performed in the following order: The examiner palpates the artery in the left arm of the examinee to determine how many times the heart beats in 10 seconds, and multiplies the number by 6 to calculate the number of beats per minute.



The Y Balance Test™ (YBT) is a simple, but reliable test used to measure dynamic balance. It was developed so as to improve its practicality, and make it commercially available. Since then, the YBT has gone on to become an extremely popular test due to its simplicity and reliability. The YBT requires the athlete to balance on one leg whilst simultaneously reaching as far as possible with the other leg in three separate directions: *anterior*, *posterolateral*, and *posteromedial*. Therefore, this test measures the athlete's strength, stability and balance in various directions.



Divide the circle into 3 by 135° , 135° and 90° degrees with duct tape or line. Then, the starting position is in a blue line with the toes on one foot in a vertical line, and the other foot is slightly touching the back of the plate. Push the input indicator as far as possible while the non-supporting foot is extended in any direction and holding the balance. The empty foot should be returned to the controlled starting position. It cannot touch the free foot while moving to maintain balance or place the foot on the desired indicator for support, and cannot occupy the indicator. The YBT composite score is calculated by summing the 3 reach directions and normalizing the results to the lower limb length, whereas asymmetry is the difference between right and left limb reach – this is explained in greater detail in the scoring system section.

The vestibulo chronometry test is available in two versions:

Method 1: The examinee rotates his head at a large amplitude while pairing his legs, standing upright and closing his eyes, and tries to maintain balance. As soon as the balance is lost, the test ends and the time counts.

Method 2: The examinee is placed inside a circle with a diameter of 50 cm, bends forward 90° and rotates rapidly around its axis; the test is stopped if he or she goes out of line or hits the line. In terms of the above-mentioned methods, we used method 1.

The experiment was conducted from October 2019 to March 2020. Children of the preparatory group aged 6-7 were involved in the experiment. They were divided into the Control Group (CG) and the Experimental Group (EG). CG took part in traditional classes and classes were held twice a week for 30 minutes. CG students did not attend classes in June-August. EG classes were held twice a week for 30 minutes. The following exercises were used only in the preparatory and final parts of this group exercise, as well as each morning:

- bring the right and left legs to the chest turn by turn without losing balance while standing up;
- leaning on the hands, bring the right knee to the left elbow and the left knee to the right elbow (10 times);
- turn your head to the right and left for 15 seconds while sitting down;
- turn your head to the right and left for 20 seconds with your eyes closed while standing upright;
- rotate the body to the right and left while leaning forward 90° (15 times);
- swallow standing on a surface 10 cm wide;
- turn left and right while holding hands in pairs (10 times);
- jump forward, backward, left side and right side on both feet;
- running from the start while leaning on your hands;
- run right to left, left to right and back to back. All of those exercises were done at home on a daily basis and helped to maintain balance, develop agility and explosive power.

RESULT AND DISCUSSION.

Balance requires the joint action of the nervous-muscular system and other multi-organ sensory systems. Balance can be tested statically and dynamically, there is currently no gold standard for the athletic sports population.

Table 1 (The Y Balance Test)

Test	Data:	2019 year				2020 year		
		1	28.10	27.11	18.12	31.01	28.02	
		2	31.10	30.11	19.12	29.01	29.02	
	C/t	Current		Interval	Fianl	Interval	Final	Difference
The Y Balance Test	c/g	-		60,8	62,8	64,9	72,5	11,7
	e/g	-		62,2	70,6	78,4	84,2	

The results of the study were obtained from the preparatory group as the followings: standing on tiptoes with closed legs, eyes closed and arms raised to maintain balance, and the time count was 5.35 in the initial study. These children, who had been engaged in traditional exercise for 6 months (February 2019), expressed the index of 7.7 ± 2.43 seconds. The balance time was only 1.2 seconds, which means that the balance function in children was almost non-existent. The balance time was further reduced during the rotation of the head with the legs together and the eyes closed while standing, and it accounted for 5.2 ± 1.17 seconds. After 6 months, the equilibrium time under the influence of such rotational motion was 6.6 ± 0.97 seconds. The 6-month growth rate of equilibrium stability was just 2.43 seconds.

Thus, it can be inferred from the Table 1 that in the early stages of learning, children had a very weak static balance stability and a very weak ability to maintain dynamic balance. It should be noted that it is of paramount importance for many experts and coaches to pay great attention to sports resources for the training of qualified athletes, and to select talented children among them. Furthermore, there is a shortage of information on the general and specific physical qualities that allow to lift the effectiveness of teaching and mastering the secrets of sports from an early age, including scientific approaches and information that reveal the secrets of balancing function.

According to the scientists, to organize the basic training of preschoolers, it is significant to assess their capabilities through some tests, maximize the process of training as well as enhance them based on the obtained results. In addition, in relay races, movement and sports games, extremely intensive runs, abrupt stops and turns, which are performed in very sharply changing directions, are repeated many times over a long period of time. It has been reported that under such loads, the heart rate

might increase to 160 beats per minute or more, that is why preschool children frequently get nervous when they make mistakes in their movements.

The impairment of coordination and accuracy of movement is associated, firstly, with swaying and loss of balance, and then, the acceleration of the heart rhythm, which leads to vibration of weak parts of the body as this situation has some negative impacts on game technique and tactics, movement coordination and accuracy. Therefore, it is highly recommended training all functional organs, in other words, forming functional training from an early age in order to prevent shaking and balance disturbances in children, including increasing the ability of the heart to withstand the effects of heavy loads. The next step was analyzing such data and feedback, then we conducted the dynamics of the effect of heart rate on the accuracy of the heartbeat of the children at preschool. (Table 2).

Table 2 (Heart rate)

The Y Balance Test	Periods of quiet and calm	Before the experiment	After the experiment	After 5 minutes	Indicators difference		
					4/1	3/1	2/1
C\G	67,8	72,5	98,3	88,2	20,4	30,5	4,7
E\G	69,1	78,9	125,1	105,7	36,6	56,6	9.8

The table represents that the heart rate of young handball players in the study was 67.8 ± 1.3 beats per minute. As we know, the heart rate (pulse) of the healthy people can be 70-90 times per minute, and in young children it is slightly lower (67-75 times). The heart rate of children aged 9-10 years was 78 ± 6.93 beats per minute. However, after 9 months of training with these children on the basis of functional capacity building, then the heart rate decreased to 4.4 beats / minute. The heart rate of young children experienced a dramatic increase in a short-term, but with intense exercise. In children in the preparatory group who participated in our study, the heart rate of them increased to 129.3 ± 5.12 beats / min under the influence of balance loads. As can be seen from Table 3, the difference between the indexes obtained at rest and after this load was 81.5 beats / min.

Table 3

Test	Data	2019 year				2020 year	
		1	28.10	29.11	20.12	27.01	26.02
		2	31.10	28.11	21.12	30.01	27.02
	C/t	Current	Interval	Fianl	Interval	Final	Difference
The vestibulo chronometry	C/g	4,26	4,63	5,49	5.97	6,48	1,44
	E/g	3,89	4,06	4,48	4,84	5,04	

Results of determination of equilibrium storage time (n = 20)

The heart rate at the end of the download (149.3 beats per minute) is 5 min. to the previous 113.6 ± 4.67 beats / min. Thus, the recovery rate of the pulse was 45.8 beats / min. However, this figure dropped to 1.3 ± 0.07 after shuttle running. The main reason of that conditions was, firstly, the effect of abruptly changing directional running load directly on the functional receptors of the vestibular analyzer led to the loss of body balance and loss of movement coordination, secondly, loading was characterized by a sharp increase in the rhythmic response of the heart (149.3 beats / min.), and it caused the body to vibrate more. After 5 minutes, the accuracy of the stroke slightly increased to 2.2 ± 0.24 times, then the difference between the first and second situations was -4.0 times the accuracy of the impact. It is the fact that the standard deviation (s) of the above-mentioned statistical indicators on heart rate (x) is relatively large indicates that the functional preparation of the children in the training group differed sharply from each other. This indicates that the children selected for the group did not pass the initial test or did not follow the selection rules.

CONCLUSION.

Although the dynamics of these indicators were relatively less seen, a sharp decrease in the accuracy of the shock was observed (Table 3). The heart rate was 69.1 ± 4.97 beats per minute at rest, and it, after exercise, increased to 125.9 ± 4.78 beats per minute, shortly after, it decreased to 109.3 ± 3.16 beats per minute. The difference between the first and second heart rate indicators was 9.8 beats per minute. The difference between the first and third indicators was 56.6 while the difference between the first and fourth results was 36.6 beats per minute. During the 5 months of pedagogical practice, we regularly used non-traditional exercises developed by us, and we witnessed a significant increase.

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