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Original Article

Impact of football clubs on the recreational activities of preschoolers

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Abstract
This article presents analysis of the impact of a recreational and health-promoting program with elements of football on the physical condition of 6-year-old children at preschool educational institutions. The pedagogical experiment involved thirty-six 6-year-old boys who attended additional classes with elements of football 3 times a week. The experiment was conducted at Chernivtsi Children's and Youth School No. 1; the classes were held by qualified football coaches with more than 10 years of experience in teaching at sports schools for children and youth. *Research methods.* Theoretical analysis of specialized scientific and methodical literature, anthropometric methods, physiological methods, confirmatory pedagogical tests. The study was conducted in full compliance with all requirements of bioethics. *Findings.* The performed experiment showed that most older preschoolers suffered from disharmony in physical development. This study confirmed boys' biological development disorders and deviations in posture and musculoskeletal system. The use of various activities significantly improved the condition of visual analyzer. Thus, the binocular vision of boys improved by 27.8 % ($p < 0.05$), and visual acuity increased by 16.6 % ($p < 0.05$). We assessed changes in the condition of boys' foot arch after the program and observed an increase in the share of children with a normal foot arch, i.e., by 25.0 % ($p < 0.05$) for the right foot and by 19.5 % ($p < 0.05$) for the left foot. Regular football classes positively affected the adaptive capabilities of an organism to physical loads. *Summary.* The proposed program can be used in the practical work by children's and youth sports school coaches, specialists working at preschool educational institutions, instructors, and teachers.
Key words: physical development, biological development, visual analyzer, physical fitness.

Introduction

Currently, Ukrainian preschool institutions are urgently searching for new technologies for preparing children for schooling without damaging their health; these technologies must provide mental, physical, and aesthetic development of the children. In recent years, the preschool education system has undergone considerable changes that are characterized by the humanization and democratization of the pedagogical process, the proclamation of a personality-oriented education paradigm, and the creation of a polyprogram educational space (Pasichnyk et al., 2018). The requirement of compulsory preschool education is substantiated not only by the fact that preschool education is an important stage in the socialization, education, and preparation of children for school but also by the elementary physiological adaptation of child to the conditions of existence among peers (Bakayev et al., 2018; Cherepov et al., 2018; Kurková, 2018). In recent years, views have been formed on the integrated development of motor, mechanical, and mental abilities in preschool children during physical education. Therefore, issues related to the scientific substantiation of the use of gaming techniques in the formation of moral qualities in children are becoming increasingly relevant. Sports games provide children a unique opportunity to show their activity, eliminate the deficit of movements, realize and affirm themselves, and obtain many positive emotions and experiences (Casonatto et al., 2016; Bolotin, 2017; Baidiuk et al., 2019; Trofimenko et al., 2019; Filipiak, 2020). The use of sports games with simplified rules at preschool age facilitate the initial period of schooling. Action-oriented games with sports elements are associated with the manifestation of moving abilities such as speed, physique, coordination, endurance, strength, and flexibility. Games with sports elements improve the sense of muscle force, sense of space, sense of time, and functions of various analysers (Andrieieva et al., 2020). In addition, action-oriented games with sports elements allow the child to master various complex types of actions, show independence, activity, and creativity (Kolobych et al., 2016).

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Noteworthy, no research to date has looked to impact of football training on preschool children's motor development. Among sports, football is one of the most attractive types of motor activity in children (Nikolaenko, 2010; Usakovsky, 2013; Abdula, 2014; Sermaxhaj et al., 2017; Doroshenko, 2019; Nazarenko, 2020; García-Ceberino et al., 2020; Kashuba et al., 2020; García-ceberino et al., 2020). However, training football elements is one of the least studied aspects in the theory and methodology of physical education of preschool children. However, the use of exercises with football elements opens up considerable opportunities for the child's psychophysical development (Serra-Olivares et al., 2015). When playing football, children develop their fundamental movement and core motor skills, and at the same time learn to be valuable football team members, show initiative, independence, perseverance, and master composure skills.

However, the recreational effect cannot always be achieved due to the lack of scientifically justified, designed and tested training programmes for preschool children. Another problematic issue is the lack of proper control over the indicators of preschool children's physical condition during lessons. There is also a significant lack of other elements of organizational and methodological support of health and recreational activities, which heightens the relevance of the research in this area.

Materials and Methods

To judge the validity of our study we'd rather provide a clear and precise description of the research methods as followed: theoretical analysis and synthesis, pedagogical methods (classroom-observation, motor abilities scores; pedagogical experiment, including constative and forming stages); methods of mathematical statistics. The analysis of literary sources and documentary materials was performed with the aim of determining the peculiarities of motor conditions in preschool children, substantiating innovative approaches to organizing health-promoting classes involving preschoolers and evaluating the possibility and expediency of using elements of sports in health promoting programs for preschool children. The evaluation of the child's physical development was performed by comparing the anthropometric standards (body length, body weight, chest circumference) with age-specific and regional standards using a traditional method. The level and harmony of physical development were determined. The evaluation of morphological and functional state in older preschoolers was performed using the method of N. Polka and S. Gozak, which included the evaluation of physical development indicators (level, harmony in terms of body weight, and chest circumference), evaluation of biological development, evaluation of the visual analyser (evaluation of binocular vision, evaluation of visual acuity according to the results of the black hand test), evaluation of the functional state of posture (evaluation of posture in the sagittal plane using the shoulder index, evaluation of posture in the frontal plane using the index of vertical curvature of the spine).

Assessment of the functional status of posture of 6-year-old children was based on the following parameters estimated during an examination from the front: head posture (usual tilting of the head to the right, to the left, forward, backward or upright position); shoulder girdle positioning (shoulders are pulled forward, lowered, put back, the level of the shoulder girdle (symmetrical - asymmetrical)); the shape and position of the chest (flattened, funnel, flat, narrowed, spherical, elongated, symmetrical and asymmetrical); the shape and size of the waist triangles, the level of the pelvic bones (symmetrical, asymmetrical); the shape and position of the abdomen (sagging, protuberant, retracted); the shape and position of the legs (O-shaped, X-shaped, half-bent at the knees).

During the examination from the back, the following parameters were estimated: head posture (tilting in one direction or the other, tilting forward, upright position); shoulder girdle positioning (the shoulders are lowered, raised, their symmetry); the position of the shoulder blades (protruding from the back ("a winged scapula") or adjacent to it, symmetrical or asymmetrical position of the lower corners of the shoulder blades); the shape and size of the waist triangles (in case of scoliotic posture, the waist triangles have different shapes): prominent waist triangle, where the convexity of the curvature is turned to, a smaller waist triangle, a larger waist triangle on the concave side).

The examination from the side. In the normal condition, the spine in the sagittal projection has the form of a wavy line with a rise in the thoracic and sacrococcygeal joints (kyphosis), an inward curvature in the cervical and lumbar part of spine (lordosis). The presence and the degree of kyphotic posture were determined by the following formula:

$$SI=SW/SAx100\ \%,$$

With *SI (%)* being the shoulder index*;*

SW (cm) being the shoulder width (the distance between shoulder points (from the acromion of the left shoulder blade to that of the right shoulder blade) -a tape measure

SA (cm) being the shoulder arc (the distance between the same points measured from the back).

The *SI* assessment: up to 89.9 % – kyphotic posture (2 points), from 90 to 100 % – physiological (normal) thoracic hyperkyphosis (1 point).

In the frontal plane, scoliotic posture was determined with the help of the index of vertical curvature of the spine (*VCS*) by the following formula:

$$VCS=LB/RBx100\ \%$$

With *LB (cm)* being the distance from the nuchal bone to the lower corner of the left shoulder blade;

RB (cm) being the distance from the nuchal bone to the lower corner of the right shoulder blade.

The *VCS* assessment: from 90 % to 110 % – correct posture (1 point), more than 110 % or less than 90 % – scoliotic posture (2 points).

Visual categorization of the children's arch index: A child stood barefoot on a hard surface (a chair). The feet were located parallel to one another with the distance of 10-15 cm between them. We measure the position of the heel bone in relation to the tibia and the condition of the longitudinal and transverse arch of the foot. When the physiological position of the foot is normal, the axes of the tibia and heel bone are at the same level, and when a child stands on tiptoe, the inner and outer arches of the feet become deeper.

The podometry method proposed by M. O. Fridland is based on determining the height of the arch and the length of the foot followed by the calculation of the foot arch index by the following formula:

$$FAI=h/lx100\ \%,$$

With *FAI* (%) being the foot arch index;

h (cm) being the foot arch height (from the bearing area to the lower edge of the tuberosity of navicular bone (tuberositas ossis navicularis)) (Fig. 1);

l (cm) being the length of the foot.

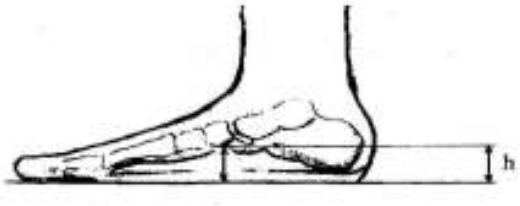

Figure 1. How to measure the arch height

Assessment of the condition of the feet arch among older preschoolers was conducted as shown in Table 1.

Table 1. Assessment of the arch of the right and left feet of older preschool children

Sex	Feet characteristics				
	flat foot	flattened foot	normal foot	high foot arch	hollow foot
Point	**3**	**2**	**1**	**2**	**3**
	The arch of the right foot				
boys	≤10.31	10.32-12.68	12.69-17.43	17.44-19.81	≥19.82
	The arch of the left foot				
boys	≤10.53	10.54-12.67	12.68-16.95	16.96-19.10	≥19.11

Flatfoot among children could be indicative of an inappropriateness of the terms and organisation of the learning process and physical education, noncompliance with the daily regime and non-optimal physical activity.

The *static endurance of the back muscles* was determined with the starting position when a child was lying on the abdomen. Hands were placed on hips, the legs were fixed, and the upper part of the body was held parallel to the floor; the head and chest were slightly elevated. The static endurance of the back muscles was determined according to the time during which a child could hold the body in that position, with the help of a stopwatch (in seconds) (Table 2).

Table 2. Assessment of the static endurance of the back muscles (sec)

Age, years	Sex	Levels of the static endurance of the back muscles			
		muscle weakness	average	above average	high
	Point	**4**	**3**	**2**	**1**
6	Boys	≤21.67	21.68-28.07	28.08-34.45	≥34.46

To make it possible to determine the degree of *flexibility*, a child had to slowly lean forward from the starting position while standing on a gymnastic bench (with straighten arms lowered towards the floor; legs had not to be bent at the knees). *Assessment of flexibility* was carried out by measuring the distance from the footrest area (the surface of the gymnastic bench) to the fingertips with a ruler or centimeter tape and comparing the results with Table 3. The results may have a negative value if the fingertips crossed the line of the footrest area.

Table 3. Assessment of flexibility (cm)

Age, years	Sex	Flexibility			
		high	above average	average	insufficient
	Point	**3**	**2**	**1**	**3**
6	boys	≤– 0.31	– 0.30-4.87	4.88-10.06	≥ 10.07

Coordination and balance were assessed on the base of the results of two tests that determined the level of the functional status of the central nervous and musculoskeletal systems.

The "Rope" test**.** A child stood up straight, one foot was placed in front of the other in a line with the toe touching the heel, the arms were stretched straight forward with the fingers spread apart and palms downwards; the eyes were closed. For the sake of convenience, one may draw a line on the floor or use element of floor decoration. Each child decided for himself, which foot to place in front of the other – the right one or the left one.

The results of the test were assessed in accordance with the time during which a child was able to hold that position without showing any signs of incoordination (shaking, change of position of the arms or legs) and compared with the data provided in Table 4. The "Tree" test (to assess the stability of the balance when standing on one leg). The foot of one leg is pressed to the knee of the other and moved aside as much as possible; the arms are raised and horizontally spread apart, the eyes are open. Each child decides for himself what leg to stand on. The time during which a child is able to hold the position without showing any signs of incoordination (shaking, change of position of the arms or the supporting foot) shall be recorded with the help of a stopwatch. The results are evaluated according to Table 4.

Table 4. Evaluation of the coordination test results (seconds)

Parameter point	Coordination and balance level		
	below average	Average	above average
	3	***2***	***1***
Age, years		**The test "Rope"**	
6	≤ 9	10-14	≥ 15
		The test "Tree"	
6	≤ 4	5-10	≥ 11

Technical competence was checked with a set of specialized tests used in the training process of young football players and consisting of the following exercises: - 10 m straight line dribbling, - dribbling between three cones located at the distance of 3 m, - dribbling between three cones in two directions - kicking accuracy for the right and left feet from the distance of 8 m (with 5 attempts), - ball dribbling with a rebound from the floor with the right and left feet. To prevent injuries, the exercise testing was preceded by preparatory exercises allowing to train. The heart rate (HR) was determined with the help of the CMS50Qa LCD Finger-Touch Heart Rate Monitor for children. We measured the pre-exercise heart rate and heart rate after standard physical loading. A normal heart rate for 6-year-old children is 78-118 beats per minute. Blood pressure was measured with the use of the oscillometric method with the RI-CHAMPION N professional electronic blood pressure monitor designed for children.

The age-appropriate systolic blood pressure for 6-year-old children is 100-122 mm Hg, normal diastolic blood pressure is 60-78 mm Hg. When examining the functional status, we determined the response of the body to exercise using the following parameters: the heart rate (HR), systolic and diastolic blood pressure. The functional characteristics were assessed before and after physical loading.

The research results were processed with the use of standard mathematical methods of statistics. We used descriptive statistics with the calculation of the following indicators: arithmetic mean ($\overline{x}$); standard deviation (S); coefficient of variation (V), %.

The Shapiro-Wilk test was used to check the sample for compliance with the normal distribution law. In the case of compliance with the normal distribution law, the Student's t-test was used for dependent samples; in the opposite case, we used the Mann–Whitney U-test.

When analyzing a significant difference between the examined indicators, the level of reliability P=95 % (significance level p=0.05) was set, and some hypotheses were checked at a higher level of reliability P =99 % (significance level p = 0.001).

Results

We proposed a health promotion program (football classes) for 6-year-old children at preschool educational institutions. The outcomes of our research pointed out effective benefits of the program are exponential; especially in terms of football classes that promote the development of a healthy and harmonious personality, organize useful leisure and action-oriented activities, and instil positive moral and volitional qualities. The duration of classes did not exceed 40 min. Classes were conducted three times a week. The expected duration of the program was 9 months. The program included special exercises aimed at learning the football technique, which contributed to the mastering of technique elements such as trapping the ball with a foot, passing the ball with a foot (inside of the foot), dribbling the ball with the left and right foot, and kicking the ball with the middle part of the foot. The program also included a series of engaging game exercises with a soccer ball such as express deliveries, action-oriented games, competitions, sports quizzes, entertainment events, holidays, and role-playing games. These exercises are understandable and interesting for children to perform.

Obtained data are quite sufficient to support the conclusion about the effectiveness of the proposed program. Because the groups for classes were not assembled by the level of physical fitness (i.e., everyone was involved), we paid special attention to the safety and accessibility of the selected tools and methods.

The effect of football elements on the morphological state in 6-year-old boys is shown in Table 5. When studying the physical development at the beginning of the pedagogical experiment, we observed that the average result of body length was within the age norm, and only 16.7% of boys had an individual result below the norm. The maximum body weight of 6-year-old boys was 25.8 kg, and the minimum was 17.3 kg, which indicated a significant difference of 8.5 kg; the average value was 19.9 ± 3.6 kg. After comparing the body mass indices of examined preschool children with age norms, it can be stated that boys have a body weight deficit. The overall average chest circumference in 6-year-old boys at the beginning of the experiment was 57.6 cm, the range of maximum and minimum values was between 61.7 cm and 52.4 cm, and the difference was 9.3 cm. By comparing the indicators of chest circumference with age norms, it can be stated that 25.0 % of boys have deviations.

At the beginning of the experiment, we paid attention to the harmonious development in children because the harmonious combination of anthropometric qualities is essential for the characterization of the level of physical development. The results of our studies show that 61.1 % of boys have disharmonious physical development in terms of body weight.

A total of 13.9 % and 8.3 % of boys have postural deviations in sagittal and frontal planes, respectively. When developing a training program with football classes, the indicators of the arch of foot should be taken into account. The podometric analysis showed that in 6-year-old boys, the length of the right foot ranged from 19.7 cm to 21.4 cm, and the length of the left foot ranged from 19.6 cm to 21.2 cm. The height of the arch of the right foot in 6-year-old boys ranged from 2.1 cm to 4.6 cm, and that of the left foot ranged from 2.2 cm to 4.7 cm. Statistically significant differences in foot indicators were not observed ($p > 0.05$). Therefore, the indices of the arch of foot ranged from 10.7 % to 21.5 % for the right foot and from 11.2 % to 22.2 % for the left foot.

Table 5. Analysis of the morphological state in 6-year-old boys during a pedagogical experiment (n = 36)

Test indicators	Before the pedagogical experiment		After the pedagogical experiment		p
	Age norm, %	Deviation from the age norm, %	Age norm, %	Deviation from the age norm, %	
Physical development					
Body length	83.3	16.7	83.3	16.7	<0.05
Body weight	38.9	61.1	58.3	41.7	<0.05
Chest circumference	75.0	25.0	88.9	11.1	<0.05
Level of physical development	72.2	27.8	91.7	8.3	>0.05
Harmony of physical development by body weight	38.9	61.1	58.3	41.7	<0.05
Harmony of physical development by chest circumference	88.9	11.1	94.4	5.6	<0.05
Visual analyser state					
Evaluation of binocular vision	19.4	80.6	47.2	52.8	<0.05
Evaluation of visual acuity	27.8	72.2	44.4	55.6	<0.05
Functional state of posture					
Posture in the sagittal plane	86.1	13.9	86.1	13.9	>0.05
Posture in the frontal plane	91.7	8.3	91.7	8.3	>0.05
Arch of the right foot	52.8	47.2	77.8	22.2	<0.05
Arch of the left foot	58.3	41.7	77.8	22.2	<0.05

The pedagogical experiment studied the dynamics of the physical development in 6-year-old boys. It was determined that during the experiment, the average body length of participants increased by 4.2 cm (4.0 %). At the same time, the average body weight of 6-year-old boys at the end of the experiment compared to that at the beginning increased by 2.4 kg (11.7 %), and the chest circumference increased by 0.9 cm (1.6 %). The statistical significance ($p < 0.05$) in the differences between body length, body weight, and chest circumference before and after the experiment was confirmed and explained by the peculiarities of physical development in senior preschool children.

The study showed that the use of football elements contributed to the normalization of weight and height indicators in 6-year-old children. Thus, after the experiment, the proportion of boys who had body weight deficit decreased by 19.4 %.

Compared to the previous stage of the experiment, the proportion of boys with stable binocular vision increased by 27.8 %, and visual acuity improved by 16.6 %.

During the study, a follow-up podometric analysis was performed, and the effect of the proposed program on the dynamics of the arch of foot in 6-year-old boys was evaluated. After the experiment, the following patterns were observed. Specifically, after the experiment, both feet were determined to be statistically significantly longer than before the experiment ($p < 0.05$); after the experiment, there was a statistically significant increase in the index of the arch of foot ($p < 0.05$). If a statistically significant increase in the foot length can be explained by the peculiarities of physical development of children's body in this age group, the improvement of the state of the arch of foot is, in our opinion, the result of the effect of the proposed program.

The next step was to study the impact of football classes on the functional status of the cardiovascular system of 6-year-old children. The functional status of an organism reveals itself in its ability to adapt to changes in the external environment, in particular to physical loading. Therefore, to assess the functional status of the cardiovascular system of 6-year-old children we measured their heart rate and blood pressure in a state of relative muscle rest and after doing exercises; the results are presented in Table 6.

Table 6. Changes in cardiovascular system measurements among 6-year-old children under the influence of playing football (n=36)

Measurements	Before the pedagogical experiment		After the pedagogical experiment		p
	$\bar{x}$	s	$\bar{x}$	s	
HR before exercise	90.7	4.17	88.5	3.07	>0.05
HR after dynamic exercises	125.6	7.14	116.1	4.58	<0.05
Resting systolic BP, mm Hg	84.7	6.05	84.1	5.38	>0.05
Systolic BP after exercise, mm Hg	92.4	7.12	87.6	3.41	<0.05
Resting diastolic BP, mm Hg	43.1	2.21	42.8	1.57	>0.05
Diastolic BP after exercise, mm Hg	49.4	3.16	48.2	2.85	>0.05

The average group heart rate in the state of relative muscle rest among the children was 90.7 beats per minute, which corresponds to the physiological norm of this age. After the end of the experiment, there was a slight trend towards lowering of the resting heart rate. In older preschool age, there is a natural decrease in the resting heart rate. The results of the examination of the HR among the children who participated in the experiment coincide with the data provided by scientific and methodological literature. An informative marker that shows the response of the cardiovascular system to physical loading is the change in the heart rate after exercise. At the beginning of the pedagogical experiment, the heart rate among 6-year-old children increased to 125.6 beats per minute in response to physical loading; it means that the increase in the heart rate is 29.9 beats per minute. The results of our scientific study indicate that the realization of the pedagogical experiment was accompanied by the process of the adaptation of 6-year-old children's organism to physical loading. For example, the average group heart rate response to physical loading significantly ($p <0.05$) decreased by 8.2 %.

The average systolic and diastolic blood pressure readings among 6-year-old boys were within age-appropriate normal limits. The analysis of individual results indicates that among 6-year-old children who participated in the pedagogical experiment there were no deviations in the studied parameters. Physical loading led to a slight increase in the blood pressure; the systolic pressure increased by 9.1 %; the diastolic pressure increased by 14.6 %. After a year of playing football, these parameters increased by 4.2 % and 11.2 % among the boys.

Therefore, this scientific research revealed that, in contrast to the HR, the blood pressure does not significantly increase in the result of physical loading; the change before the pedagogical experiment and after it also had no significant differences ($p> 0.05$).

The next stage of our scientific work was a study on the physical fitness in 6-year-old boys. The analysis of the data obtained at the beginning of the pedagogical experiment allowed us to identify the basic

patterns of the development of motor qualities of boys over a period of 9 months. The test results are shown in Table 7. The determination of functional readiness of the musculoskeletal system for a static load by the level of static endurance of the back muscles in 6-year-old children showed that at the beginning of the pedagogical experiment, when performing the test exercise, the vast majority of boys had a low level of static endurance of the back muscles. Thus, 6-year-old boys were characterized by underdeveloped flexibility, and individual results ranged from 1 cm to 12.4 cm, which indicated a significant variability for this indicator. During testing of coordination abilities and static balance, we determined that the vast majority of 6-year-old boys had a low level for these parameters. When performing a complicated Romberg test with their eyes closed, the vast majority of 6-year-old boys were unable to maintain balance. This result may indicate a significant effect of the visual analyser in 6-year-old boys. The highest results in 6-year-old boys were observed when performing a dexterity test; 36.1 % of boys had high level of dexterity.

The analysis of physical fitness of the participants (especially in terms of static endurance, flexibility, coordination qualities, and static balance) indicates a low level prevalence, which should be taken into account when developing a health promotion program (football classes).

Table 7. Distribution of 6-year-old boys by level of physical fitness during a pedagogical experiment, % (n = 36)

Test indicators	Before the pedagogical experiment			After the pedagogical experiment			p
	Low level	Medium level	High level	Low level	Medium level	High level	
Static endurance of the back muscles	47.2	33.3	19.5	41.7	33.3	25.0	>0.05
Flexibility	63.9	19.4	16.7	30.6	41.7	27.7	<0.05
Coordination abilities	58.3	33.3	8.4	16.7	47.2	36.2	<0.05
Static balance	72.1	19.5	8.4	30.6	44.3	25.1	<0.05
Static balance with visual analyser	80.5	19.5	0.0	33.3	63.9	2.8	<0.05
Dexterity	30.6	33.3	36.1	16.7	47.2	36.1	<0.05

After the experiment, we conducted a follow-up study of the components of physical fitness in 6-year-old boys who participated in the health promotion program (football classes) for 9 months. A statistically significant ($p < 0.05$) increase in flexibility, coordination abilities, and static balance was recorded after the experiment. The maximum increase of 47.2 % was observed in the static balance with visual analyser.

The next stage of our study was to determine the impact of the proposed programme on technical competence of the children. It is known that at an early stage of becoming a football player technical competence is the foundation that permits to create a variety of technical skills necessary for further playing activities. We examined technical competence of the preschoolers having carried out the analysis of the results in ball dribbling, juggling and kicking accuracy. The proposed tests enabled analyzing the degree of ball mastery among 6-year-old children. Changes in the obtained results are shown in Table 8.

Table 8. Changes in the results of examination of technical competence among 6-year-old boys during the pedagogical experiment (n=36)

Parameters	Before the pedagogical experiment		After the pedagogical experiment		p
	$\bar{x}$	s	$\bar{x}$	s	
Straight line ball dribbling, sec	5.9	0.74	4.1	0.26	<0.05
Zigzag dribbling, sec	16.7	1.12	13.6	0.93	<0.05
Juggling with the right foot, the number of times	2.9	0.98	5.8	0.17	<0.05
Juggling with the left foot, the number of times	1.6	0.86	1.8	0.33	>0.05
Kicking accuracy for the right foot, the number of times	1.3	0.29	2.1	0.14	<0.05
Kicking accuracy for the left foot, the number of times	1.2	0.48	1.3	0.09	>0.05

When comparing the results obtained before and after the pedagogical experiment, it can be stated that there was a significant ($p <0.05$) improvement in the results of ball dribbling of different kinds. Analysis of the results of ball juggling and kicking accuracy indicates that the children showed asymmetry when performing physical actions at the end of the pedagogical experiment. There is a significant ($p <0.05$) increase in the parameters of the technical level of movements performed by the right foot among 6-year-old boys. There is also some positive dynamics in movements performed by the left foot. To reduce the asymmetry coefficient, which in

the future will affect the quality of gaming activities, we have made adjustments to the proposed recreational and health-promoting programme.

The principal methodological conditions for the implementation of the health promotion program (football classes) were as follows: consideration of the initial level of indicators of the physical condition in 6-year-old children; adequate primary, operational, and current medical and pedagogical monitoring; consideration of children's needs in terms of health-promoting activities; creation of a full programmable support of health-promoting activities; improvement of professional competence and qualifications, methodological support for trainers conducting classes according to the proposed program; creation of optimal working conditions for children's trainers; creation of favourable conditions for personal development and creative self-realization of children involved in classes; flexibility and mobility of the program in responding to changes that occur in children during health-promoting activities.

Discussion

Currently, there is a steady trend of increased focus on the issue of preparing children for school, continuity and consistency, and close interaction of all educational institutions (Svystun et al., 2014; Osipov et al., 2018; Larsen et al., 2018). For the past several years, Ukraine has been introducing compulsory preschool education for 5-year-old children. The education reform is tasked with creating conditions not only to strengthen the intellectual potential of the nation but also to preserve the physical and mental health of every child (Prontenko et al., 2020). This process is complex because the period of preschool childhood is especially important because during this period of time the active formation of personality occurs, which lays the foundation for the whole subsequent life of a person and determines their values, life vectors, lifestyle and activity, as well as life perspective (Nagovitsyn et al., 2017). However, scientists argue that currently only 2-5 % of first-graders can be considered healthy; 53-68 % have various functional deviations, and 30-42 % have chronic diseases. Thus, there is an urgent need for the introduction of health promotion techniques for children (Galan et al., 2018). The abovementioned reasons require the formulation of priority tasks for the family, preschool education institutions, out-of-school institutions under current conditions, and in extracurricular activities for middle and high school age groups, i.e., creation of most favourable conditions for improving their physical and mental state by various motor activities (Cherepov, 2015; Blagii et al., 2018; Paliichuk et al., 2018; Kozhokar et al., 2018). Scientists have identified the limited capacity of preschool education institutions in the implementation of health-promoting activities for 6-year-old children as part of the organization and implementation of health promotion techniques (Galan et al., 2019). Of note, the existing approaches to organizing health-promoting activities for children at sports and entertainment centres remain insufficiently covered, and the existing recent recommendations are mostly imperfect and unclear, which requires further research (González-Víllora et al., 2015; Lebedev et al., 2017; Griban et al., 2018; Prontenko et al., 2019).

Conclusion

The effectiveness of the proposed health promotion program (football classes) is confirmed by the results of the pedagogical experiment. Significant positive changes in the indicators of the morphological state occurred. The study showed that the use of the health promotion program with football elements contributed to the normalization of weight and height indicators in 6-year-old children. The distribution of children by the state of the arch of foot (depending on the experiment stage) revealed the increased proportion of children with the arch of foot corresponding to the age norm. Significant positive changes also occurred in terms of physical fitness in children owing to the use of various football elements and the game method.

Preschool children demonstrated high growth rates of technical training. Out of the six tests, four improved at a significance level of $p < 0.05$. The results in juggling the ball and accuracy shots performed with the left foot did not have any significant $p > 0.05$ changes. Taking into account the asymmetry between the right and left feet in the results of juggling and accuracy shots at the end of the pedagogical experiment, we have made adjustments to the health and recreation programme in order to reduce the coefficient of asymmetry.

Conflict of interest

The authors declare that there is no conflict of interest.

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