

The educational and training program at the preparatory stage for young Sambo athletes

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Abstract:

Training children who specialize early in a chosen sport presents challenges owing to insufficient research on various aspects of their development. In Sambo wrestling, the preliminary training of children aged 4-6 has not been adequately explored. **Purpose:** This study aims to develop and experimentally validate a comprehensive developmental program for preliminary training in Sambo wrestling for boys aged 4-6 years. **Materials and Methods:** The pedagogical experiment was performed at a Sambo wrestling club in Kaliningrad. Thirty boys aged 4-6 years (mean age 5.7 ± 1.2 years) participated in the study, with 15 children assigned to the experimental group (EG) and 15 to the control group (CG). In both experimental groups, training was held three times a week for 45 minutes. In CG, children trained according to the general physical fitness development program, which is presented in the traditional methodology. The educational and training process of children in EG was organized according to the program of preliminary general physical training of children for Sambo wrestling developed by us, which had a sports and health focus. The proposed program differs from the traditional program for the development of general physical qualities in the means and methods of physical training used. In the educational and training process of children EG, a significant role was given to the game method, which was used in each part of the training. **Results.** Quite a high efficiency of the proposed program was established. Analysis of the results of testing motor qualities and functional fitness of children in the experimental group showed that the values of the indicators in athletes of this group exceed them in children in the control group. In the experimental group, the values of the indicators in tests for speed, coordination abilities and agility, dynamic speed-strength endurance of the muscles of the lower extremities, flexibility of the hip joints and spine, accuracy of motor actions are significantly higher. Of the functional indicators, a significantly higher value of strength indicators of the muscles of the hand of both hands and static balance was noted in children EG compared to CG. **Conclusions.** The tested program for developing general physical fitness in 4-6-year-old boys for the preliminary stage of Sambo wrestling classes can be recommended for use in children's sports institutions.

Key Words: Sambo wrestling, preliminary stage of training, physical fitness, functional fitness

Introduction

In human sports activities, an important role is given to physical education and sports work, which is associated with martial arts (Ioannides et al., 2020; Koshcheyev & Dolbysheva, 2021). Sambo wrestling is a popular type of martial arts among young people, in which basic self-defense skills are successfully implemented (Vorozheikin et al., 2022). Sambo classes develop self-control, endurance and determination. There is a development of social activity of the personality of martial artists, including those practicing Sambo (Grigorieva et al., 2017; Bocharin et al., 2024) and the formation of high discipline in them (Slobodchikov, & Ulyankin, 2022). The scientific literature presents materials showing that some exercises and techniques from various martial arts can effectively reduce the level of stress and depression in an athlete (Greco, Roberto De Ronzi, 2020; Davidenko et al., 2024). Scientific evidence is presented that physical exercises from martial arts based on exercises of varying complexity are successfully used to correct morphofunctional deviations in the

1376-----

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musculoskeletal system (Mischenko et al., 2020). Martial arts have a positive effect on and stimulate human physical development and physical fitness (Abramova et al., 2022). An important role is given to the development of motor skills of an athlete engaged in martial arts, as shown by the example of Kyokushinkai karate (Dvorkin et al., 2019) and Sambo wrestling (Drid et al., 2021). A person's athletic achievements are largely determined by his morphofunctional characteristics, which are laid down and improved in childhood. According to Garcia et al. (2009), of all children starting to practice judo, 73% are aged 4-8 years, most of them began training at the age of five to six years. According to the results of their study, it is children with early specialization who achieve the highest results in sports activities. Therefore, coaches need to carefully approach the construction of the educational and training process in order to develop the necessary inclinations for future sports activities at all stages of sports training (Osipov et al., 2020; Guillermo et al., 2020; Fathir et al., 2021).

The great popularity of Sambo wrestling among children and young people contributes to the development of this sport in many countries. Parents have become more active in their children's activities at the age of 4-6 years in this particular sport and began to bring them to the initial sports training groups. For children of this age, sports and health-oriented groups are created, in which the child's sports training is focused on the development of all motor qualities and abilities of children, taking into account the sensitive stages of development. The sports and health stage of training a young athlete allows you to arouse interest in sports and lay the foundation for special sports training in Sambo. In young martial artists, an important role is given to improving the cardiorespiratory capabilities of the body during training sessions (Dupuy & Dugué, 2018). Increasing the reserve capacity of the cardiovascular system is the basis for developing the strength and speed qualities of an athlete. Well-developed physical qualities of an athlete are the basis for improving technique, tactics and psycho-emotional stability (Nugroho et al., 2021; Fachrezzy et al. 2021). Scientific publications devoted to teaching children martial arts emphasize that the training process, including at the beginning of sports activities, should take into account the child's motor and psychomotor abilities. Physical activity should be appropriate for the age of children and sensitive periods of development of motor qualities and skills (Zeng et al., 2015).

At all stages of an athlete's training, including the sports and health stage, the following types of training are distinguished: theoretical, general physical, special physical, technical and tactical (Gubenkov, & Nikolaev, 2020; Makhov, 2020; Vorozheikin et al., 2022). In the training process of young Sambo athletes, integrative classes with a variety of training tools must be used. It is necessary to widely use the game method with outdoor games and game tasks. This increases children's interest in training, which has a positive effect on its effectiveness (Nikitushkin, & Minkov, 2019; Singh et al., 2021).

An analysis of scientific literature indicates existing shortcomings in the practice of sports training for children practicing Sambo. The shortcomings include the transfer of existing methods of training children in related types of martial arts, forcing training loads in the context of taking into account age-sensitive periods and psychological characteristics of preschool children. This leads to a delay in the growth of athletic achievements and a loss of interest in the child in this sport. This can often lead to injuries in young athletes, which makes it impossible to continue sports activities (Mardiana et al., 2021; Vorozheikin et al., 2020). Analysis of scientific and methodological literature indicates that the existing problems in training children at the preliminary stage of preparation for Sambo wrestling classes are caused by insufficiently complete methodological support for the training process in this sport. The peculiarity of building such a training program is that it should be clearly structured and based on the key principles of the theory and practice of physical education, sports psychology and pedagogy, taking into account the specific features of the sport, age and sensitive periods of the child.

In this regard, the development and testing of general developmental training programs at the preliminary stage of preparation for Sambo wrestling classes is one of the urgent and demanded tasks of sports pedagogy in childhood.

Purpose: To develop and experimentally substantiate a general development program for preliminary training in 4-6-year-old children for Sambo wrestling.

Material & methods

The educational experiment was conducted at the White Wolf Sambo wrestling club in Kaliningrad (Russia). The study involved 30 boys aged 4-6 years (5.7 ± 1.2 years), who were randomly divided into an experimental group (EG, $n=15$ children) and a control group (CG, $n=15$). Voluntary written consent from the children's parents for their participation in the experiment was available. All children who participated in the experiment had no experience in Sambo wrestling. The experiment does not contradict the principles of the 2008 Helsinki Declaration, which lists moral and ethical standards for conducting scientific research involving people.

In both experimental groups, training was conducted three times a week for 45 minutes. In CG, children trained according to the general physical fitness development program, which is presented in the traditional methodology (Federal Standard of sports training in the sport of Sambo Wrestling, 2022). The educational and training process of children in EG was organized according to the general development training program developed by us at the preliminary stage of preparation for Sambo wrestling classes, which had a sports and health focus.

In EG and CG, during the first three weeks of classes, a milestone monitoring of the boys' physical and functional fitness indicators was conducted. Taking into account the physical development indicators, scheduled training began. The annual plan for the sports training of young Sambo wrestlers in EG in the proportions we proposed is presented in Table 1.

Table 1. Annual educational and thematic plan for training sessions for children of EG

Section name	Месяц									
	IX	X	XI	XII	I	II	III	IV	V	Итого
Theoretical classes on Sambo wrestling	1		1			1		1		4
General physical training	3	3	3	3	3	3	3	3	3	27
Special physical training	3	3	2	3	2	3	3	2	2	23
Technical and tactical training		3	3	4	4	4	4	4	4	30
Acrobatics	2	2	2	3	2	2	3	2	2	20
Outdoor games	2	3	2	2	2	2	3	2	2	20
Credit				1				1		2
Rehabilitation activities	1	1	1	2	1	1	1	1	1	10
Total for a month	13	17	14	17	14	15	17	16	14	
In just one year	136									

Theoretical classes covered issues related to the history of the formation and development of Sambo wrestling, the main terms in this sport, the basics of sports training and the rules for maintaining a healthy lifestyle. Theoretical classes lasted 3-5 minutes per training session. Preschoolers learned exercises similar to movements in Sambo wrestling (jumps, turns, quick changes in direction, swings, balances). In the experimental group, age-related periodization of the training process was of great importance and the leading role was given to the comprehensive general physical and functional training of the child.

During training, elements of non-trivial starting positions in physical exercises known to children were used. For example, running from the starting position - sitting, lying or kneeling, changing the speed and tempo of movement, using different rhythmic combinations, changing the way the exercises were performed: throwing from above, below, from the side, jumping on one or two legs, with a turn.

The following physical education tools were used: general developmental exercises; outdoor, sports games and game plots; elements of acrobatics; jumps and jumping exercises; throwing light projectiles; strength exercises. The following methods were used in the work: game; repeated; uniform; circular and competitive. The following organizational forms were used: group training sessions; individual training sessions; medical and rehabilitation activities; milestone certification. For the general physical training of young EG athletes, the main means of physical education were: drill and general developmental exercises; loads with objects; outdoor and sports games; exercises from other sports. Special physical training was aimed at developing certain physical qualities characteristic of Sambo wrestling, special endurance and strength, "explosive" strength, speed-strength qualities. The main means of special physical training were strength and gymnastic exercises, various types of push-ups, pull-ups on a horizontal bar, squats, lunges. To develop flexibility, the following exercises were used: bends, stretching of individual muscle groups; hanging on a horizontal bar. To develop agility, endurance, and coordination, they used jumping rope, jumping up, jumping over obstacles, running with high hip lifts; exercises to develop the abdominal muscles; basic movements, basic stances, and movements in Sambo wrestling.

One of the important conditions of the classes was the correspondence of the training loads to the child's age and their state of physical and functional fitness. Forced loads were not allowed, which is important for the child's body. Particular attention was paid to exercises with weights. For children aged 4-6, exercises with weights were used, the weight of which did not exceed 20% of their own body weight. Speed-strength loads were used in training in doses of 2-3 minutes, followed by a period of active rest. Endurance exercises for children were carried out using a uniform method with a heart rate not exceeding 130-140 beats per minute. An important role in the educational and training process of children EG was given to the game method. When building classes in EG, game exercises were used in each part of the training session. In the preparatory part, the game scenario assumed a demonstration of the main characteristic features of the physical exercise, which the children should easily recognize. Attention was paid to the funniness of the behavior, for example, of the animal whose name the exercise bears. This set the children up for a positive atmosphere during the training.

In the main part of the training, the game scenario included a figurative or conditional "plot" in which it was envisaged to achieve some goal. For example, give the children the task of coming up with an image and

expressing this image with a well-known gymnastic exercise. Such game tasks solved not only the pedagogical problems of physical education, but also developed cognitive abilities in children.

In the final part, games were also used, but of medium or low mobility, for example, games that use exercises to develop fine motor skills of the hands.

In EG, the content of technical and tactical training in Sambo wrestling was determined by its peculiarity, namely, that it is a martial art in which athletes perform a series of motor actions using striking and throwing techniques. This training at the sports and health stage is of an introductory nature and has the goal of teaching children the basic elements of technique and tactics of Sambo wrestling.

Motor skills of children were tested in both groups at the beginning and at the end of the experiment. The tests included exercises for physical skills that are basic for determining an athlete's individual abilities and suitability for the sport in question. The following tests were performed: speed: 30m sprint from a high start, s; agility: 3x10m shuttle run, s; speed-strength endurance of the lower limb muscles: standing long jump with both legs, cm; speed-strength endurance of the upper limb muscles: throwing a medicine ball for a distance from a sitting position with legs apart, the mass of the ball is 1 kg, cm; flexibility: forward bends of the torso on a gymnastic bench with the maximum lowering of the fingers down, cm, and the "bridge" exercise, the distance from the edge of the fingers to the heels, cm; passive flexibility: the "split" exercise, the arithmetic mean of the sum of three splits (two longitudinal and a transverse), cm; coordination endurance: jumping rope for 60 sec, number of times; general endurance: walking at an individual pace for 10 minutes, number of meters covered during this time in meters; coordination abilities and accuracy: throwing a tennis ball into a circle with a diameter of 60 cm from a distance of 4 meters three times with each hand, number of times. Of the functional indicators, the strength of the hands of both hands was measured, kg, and static balance was assessed using the balance test on one leg, s.

Standard methods of mathematical statistics were used to process the digital data - the mean value, its error and the reliability of differences between the mean values of the indicators for two samples (before the experiment and at its end) were calculated. The reliability of the difference was determined by calculating the t-Student criterion. The difference was considered reliable at $p < 0.05$.

Results

It was established that at the beginning of the pedagogical experiment, the values of the indicators of physical fitness and functional indicators of children in the control and experimental groups practically did not differ from each other, $p > 0.05$, table 2.

Table 2. Values of indicators of physical fitness of children CG and EG at the beginning of the pedagogical experiment, $M \pm m$

		Experiment 3, M±m	
№	Test	M±m	
		CG	EG
Physical fitness			
1.	30 meter run, s	8.65 ±0.034	8.68 ±0.032
2.	Shuttle run 3x10 m, s	12.4±0.25	12.3 ±0.22
3.	Big jump from a standing position with two legs, cm	65.3±13.3	67.5±15.4
4.	Medicated ball throw for distance from a sitting position, legs apart, cm	150.3±17.8	148.0±16.3
5.	Forward torso bends on a gymnastic bench, cm	4.65 ±0.28	4.5±0.23
6.	Bridge exercise, cm	16.2 ±1.87	15.3±1.54
7.	Split exercise, cm	9.06±1.10	9.0±0.94
8.	Jumping rope for 60 sec, number of times	12.0±1.43	12.5±1.84
9.	Walking 10 minutes, m	554.0±120.2	550.0±95.3
10.	Throwing a tennis ball into a circle with a diameter of 60 cm from a distance of 4 meters three times with each hand, number of times	1.5 ±0.92	1.6 ±0.97
Functional fitness			
11.	Dynamometry of the right hand, kg	9.8±1.23	9.6±1.20
12.	Dynamometry of the left hand, kg	9.2±1.04	9.0±1.02
13.	Maintaining balance on one leg, s	35.4±4.21	32.5±3.34

After 9 months of regular training sessions, repeated testing of the state of physical and functional fitness of children in CG and EG was conducted. As a result of testing, changes in the values of the indicators of children in both experimental groups were established, Table 3.

Table 3. Values of the indicators of physical fitness of children CG and EG at the end of the pedagogical experiment, $M \pm m$

		Experiment, M±m	
№	Test	M±m	
		CG	EG
Physical fitness			
1.	30 meter run, s	8.50 ±0.03	8.32 ±0.02*
2.	Shuttle run 3x10 m, s	11.88 ±0.08	11,55 ±0.09*
3.	Big jump from a standing position with two legs, cm	74.4±10.8	99.7±14.2*
4.	Medicated ball throw for distance from a sitting position, legs apart, cm	164.7±19.2	175.0±17.5
5.	Forward torso bends on a gymnastic bench, cm	6.2 ±0.35	6.8±0.22*
6.	Bridge exercise, cm	14.9 ±1.66	11.0±1.32*
7.	Split exercise, cm	8.5±0.72	6.2±*1.45
8.	Jumping rope for 60 sec, number of times	21.0±2.67	23.4±2.34
9.	Walking 10 minutes, m	610.0±145.6	670.0±95.3
10.	Throwing a tennis ball into a circle with a diameter of 60x60 cm from a distance of 4 meters three times with each hand, number of times	1.60±0.08	1.86 ±0.09 *
Functional fitness			
11.	Dynamometry of the right hand, kg	11.4±1.15	15.6±1.60*
12.	Dynamometry of the left hand, kg	10.4±1.04	13.5±1.14*
13.	Maintaining balance on one leg, s	45.4±5.68	57.2±4.34*

Note: * - significant difference in test scores between CG and EG children, $p < 0.05$

At the end of the educational experiment, the values of all indicators of physical and functional fitness increased in children in both experimental groups. After completing the testing of the proposed program for the development of general physical fitness in the experimental group, a reliably significant increase in the values of indicators in seven physical and two functional fitness tests was found compared to the results in the control group, $p < 0.05$, Table 3. The values of indicators in the motor qualities of speed, coordination abilities and dexterity, in dynamic speed-strength endurance of the muscles of the lower extremities, flexibility of the hip joints and spine, accuracy of motor actions were significantly higher compared to the results in CG. In the functional characteristics, children EG showed a significantly higher value of strength indicators of the muscles of the hands and static balance compared to CG, $p < 0.05$.

At the end of testing the program we proposed for developing general physical fitness in children in the experimental group, the increase in the values of the indicators was greater in all motor tests, compared with the results of the increase in children in the control group, Figure 1.

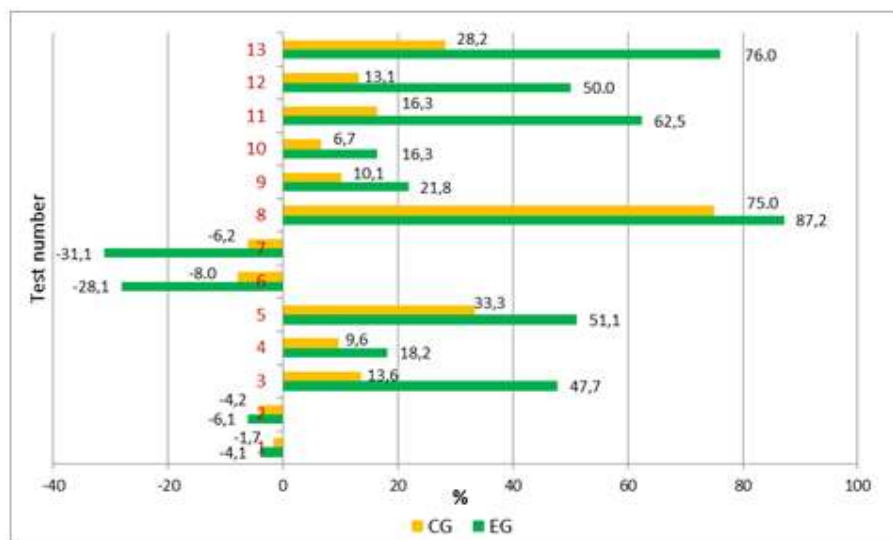


Fig. 1. Increase in the values of the indicators in the motor and functional tests of children at the end of the pedagogical experiment

The highest increase in the values of the indicators of physical fitness in boys of the experimental group compared to the control group was recorded in motor tests No. 8 ("jumping rope for 60 sec"), No 5 ("forward bends of the body on a gymnastic bench") and No 3 ("long jump from a place with two legs"). In EG, the greatest increase in the values of the functional indicators was also established in tests No. 11 ("dynamometry of the right hand"), No 12 ("dynamometry of the left hand") and No 13 ("keeping balance on one leg").

The results of the analysis of the testing of physical and functional fitness of children EG indicate the effectiveness of the general developmental program proposed by the authors for preliminary preparation for Sambo wrestling classes for children aged 4-6 years compared to the traditional program for this sport.

Dicussion

Early sports specialization in children can have a significant impact on their future prospects for sports (Garcia et al., 2009). Currently, in many sports, children are showing a trend towards a lower age threshold for starting to engage in sports activities. In this regard, there is a need to create general development programs for the child to prepare him or her to start training in a particular sport. Upon reaching the age of starting to practice a chosen sport, the child has a stock of knowledge, skills, abilities, and developed motor skills for further training in the chosen sport. Such preliminary preparation helps to develop an interest in sports and to motivate the child to be physically active and to adhere to the basics of a healthy lifestyle.

An important aspect of early sports specialization is the development of the child's basic physical and functional qualities that are necessary in sports. Analysis of scientific and methodological literature indicates that there is limited material that reflects the results of creating and testing training programs for preliminary training of children for Sambo wrestling. In turn, this can cause coaches to make mistakes in planning, organizing and conducting the training process for children with early sports specialization. A description is given of the occurrence of overtraining and overfatigue (Losnegard et al., 2021; Lichti et al., 2023), as well as the occurrence of sports injuries, which discredits sports activities and leads to the elimination of young athletes from sections (Mardiana et al., 2021).

The importance of innovative design of training sessions in martial arts is indicated by the works of a number of authors (Osipov et al., 2020; Guillermo et al., 2020; Fathir et al., 2021). The authors' conclusions emphasize the need to develop curricula and methodological materials dedicated to the preliminary training of children in Sambo wrestling. These data indicate the relevance, timeliness and practical significance of our study.

Our research work is devoted to the development and testing of a general developmental program for preliminary training of children aged 4-6 years for Sambo wrestling. The program expands the methodological material of the educational and training process for young martial artists. The proposed program differs from the traditional program for the development of general physical qualities in the means and methods of physical training used. In the educational and training process of EG children, a significant role was given to the game method, which was used in each part of the training. The game method created a positive atmosphere in the lesson and aroused the interest of young athletes in physical exercises, which made it possible to intensify educational and training activities.

This is confirmed by the higher results of motor and functional testing of children in the experimental group, compared to the control group, where the traditional methodology for training young athletes was used. In seven out of 10 motor tests and in three functional tests, the result of children in the experimental group was significantly higher compared to the result of children in the control group. Our data are confirmed by the results of studies by other authors who used the game method in training athletes of various training areas (Nikitushkin, & Minkov, 2019; Singh et al., 2021).

The use of the game method has a positive effect on the improvement of fine motor skills, which stimulates the development of cognitive abilities in the child. The key condition for conducting training sessions for children in experimental groups was strict dosing of physical activity, especially in exercises with weights, as well as compliance with the age and sensitive periods of development of motor skills. This is reported by a number of researchers (Zeng et al., 2015), with whose conclusions we fully agree.

The sports and health-improving focus of the proposed program involves not only achieving success in sports training, but also maintaining and strengthening the health of children who practice Sambo wrestling. This is due to the fact that martial arts are successfully used for the preventive correction of musculoskeletal system abnormalities (Mischenko et al., 2020). Martial arts classes have a positive effect on the physical development and physical and functional fitness of a young athlete, which is manifested in the improvement and increase of their level (Abramova et al., 2021). The positive results of testing the program we proposed are confirmed by the results of the study of these authors.

The developed and tested methodology of sports and health-improving focus on the development of general physical fitness for preliminary preparation for Sambo wrestling classes has proven its effectiveness and it can be used in the educational and training process for children 4-6 years old.

Conclusions

A training program for the development of general physical fitness for children aged 4-6 years, which is a preliminary sports and health training for Sambo wrestling, has been developed and experimentally tested. The proposed program has differences in the means, methods and forms of organizing training sessions from the generally accepted methodology for developing the main motor skills of children who are engaged in Sambo wrestling at the initial stage of preparation. In the training process of children in the experimental group, a significant role was given to the game method, which was used in each part of the training.

A more significant effectiveness of the proposed program has been established. The results of testing the main motor skills and functional fitness of children in the experimental group exceed the results of young athletes in the control group. In the experimental group of children, the values of the indicators in the motor tests for speed, coordination abilities and agility, in the dynamic endurance of the muscles of the lower extremities, flexibility of the hip joints and spine, accuracy of motor actions, strength indicators of the muscles of the hands and static balance were significantly higher compared to the results of children in the control group. The proposed program can be recommended for use in other children's sports institutions to prepare children aged 4-6 years for Sambo wrestling.

Conflicts of interest. The authors declare no conflict of interest.

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