FUNCTIONAL TRAINING OF SAMBO WRESTLERS DURING THE PREPARATION PERIOD AT THE STAGE OF SPORTS SPECIALIZATION

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The stage of sports specialization in sambo wrestling is characterized by a decrease in the share of general physical fitness and an increase in the role of special exercises in the training process of a wrestler. Against the background of an increase in the volume and intensity of tasks, the risks of forcing sports results may increase. The motor base becomes scarce, and stereotypical movements often lead to injuries. In turn, there is a need to modernize the training process in sambo wrestling, increasing the functionality of exercises. This approach is aimed at preserving the athlete's health and improving the quality of physical and technical training of athletes. *The purpose of the research* is to study the influence of functional training in the preparatory period on the indicators of physical and technical training of sambo athletes at the stage of sports specialization. *The results of the research.* The basic principles of functional training of SAMBO wrestlers are defined, consisting in the use of low-intensity exercises that increase joint mobility, strength of priority muscle groups, coordination of movements and dexterity. Tasks should become more complicated and updated during the season. A pedagogical experiment was conducted with the participation of 24 female athletes engaged in sambo wrestling. *Conclusions. 1.* Functional training exercises should reflect the main motor tasks of sambo wrestlers, should be multiarticulate, diverse, and coordination complex. 2. The model of functional training of sambo wrestlers aged 13-14 years includes mobility, stability and control of the wrestler's movements. 3. It has been experimentally proved that the use of exercises with high functional value in the preparatory period of training sambo athletes aged 13-14 years at the stage of sports specialization has a more pronounced effect on the indicators of physical and technical fitness of athletes.

Keywords: sambo wrestling, functional training, physical training, training process.

Денис Такіі, Ольга Самолюк, Тетяна Чебан. Функціональна підготовка самбістів у підготовчому періоді на етапі спортивної спеціалізації

Анотація. Етап спортивної спеціалізації в боротьбі самбо характеризується зниженням частки загальної фізичної підготовки і збільшенням ролі спеціальних вправ в навчально-тренувальному процесі борця. На фоні збільшення обсягу та інтенсивності завдань, можуть зростати ризики формування спортивних результатів. Рухова база стає мізерною, а стереотипні рухи нерідко призводять до травм. У свою чергу, існує необхідність модернізації навчально-тренувального процесу в боротьбі самбо, збільшуючи функціональність вправ. Даний підхід спрямований на збереження здоров'я спортсмена і підвищення якості фізичної та технічної підготовки спортсменів. *Мета дослідження* – вивчити вплив функціонального тренінгу в підготовчому періоді на показники фізичної та технічної підготовки самбісток на етапі спортивної спеціалізації. *Результати дослідження.* Визначено основні принципи функціональної підготовки борців самбо, що полягають у застосуванні низькоінтенсивних вправ, що підвищують мобільність суглобів, сили пріоритетних м'язових груп, координації рухів і спритності. Завдання повинні ускладнюватися і оновлюватися протягом сезону. Був проведений педагогічний експеримент за участю 24 спортсменок, що займаються боротьбою самбо. *Висновок*. 1. Вправи функціонального тренінгу повинні відображати основні рухові завдання борців самбо, повинні бути багатосуглобовими, різноманітними, координаційно складними. 2. Модель функціональної підготовки самбісток 11-13 років включає мобільність, стабільність і контроль рухів борця. 3. Експериментально доведено, що застосування в підготовчому періоді підготовки самбісток 11-13 років на етапі спортивної спеціалізації вправ з високою функціональною цінністю має більш виражений ефект на показники фізичної і технічної підготовки спортсменів, на відміну від традиційної методики, заснованої на великих обсягах фізичного навантаження і високоінтенсивних вправах.

Ключові слова: боротьба самбо, функціональний тренінг, фізична підготовка, навчально-тренувальний процес.

Introduction

SAMBO wrestling is actively developing in the sports and applied direction. According to the rules of the competition, sambo wrestlers perform coordination and tactically complex motor actions, including throws, holds, painful techniques, as well as a wide range of defensive actions. The system of training SAMBO wrestlers has been improving for many years. Approaches to physical development and integration of several types of training are changing. Modernization of physical training of sambo wrestlers remains an urgent issue for most specialists [9; 16; 23].

In order to obtain high sports results, the long-term training of a sambo wrestler is aimed at consistently solving developmental and educational tasks. Depending on the stage and period of the training process, the tasks and means of physical training vary. The stage of sports specialization is characterized by a decrease in the share of general physical fitness and an increase in the role of special exercises in the training process of a wrestler. Against the background of an increase in the volume and intensity of tasks, the risks of forming sports results may increase. The motor base becomes scarce, and stereotypical movements often lead to injuries [7; 24; 25].

The preparatory period in the training of wrestlers is associated with the creation of a solid foundation for the future conditions of the athlete. Traditionally, the

preparatory period is a high-volume and high-intensity physical activity applied for 9-10 weeks. The basis consists of general preparatory exercises. However, it must be remembered that even general exercises should be used taking into account the specialization of athletes. The fundamental nature of training means organizing with their help the basis for special movements of the wrestler and increasing their functionality. This, in turn, can have a positive effect on the speed of mastering technical and tactical actions in the future, reduce the risks of early sports specialization, the creation of stereotypical movements and sports injuries [29; 30]. The more functional the exercises are, the smaller the volume and intensity of the proposed physical activity. This, in turn, allows you to preserve the athlete's health, especially the functions of the musculoskeletal system, cardiovascular and hormonal systems [11; 20]. Functional training, in this regard, comes to the fore in the preparatory period of training sambo wrestlers at the stage of sports specialization. To date, functional training in the preparation of wrestlers has not been studied enough. The question remains open regarding the content of functional training classes in the training groups of SAMBO wrestlers in the preparatory period and the degree of their effectiveness.

Materials And Methods

The purpose of the research is to study the influence of functional training in the preparatory period on the indicators of physical and technical training of sambo athletes at the stage of sports specialization.

The hypothesis of the research is that it is assumed that the training process of sambo athletes at the stage of sports specialization in the preparatory period can be improved provided that the functionality of the exercises is increased. It is expected that the indicators of physical and technical training of athletes will improve.

Research participants. The experiment was attended by sambo wrestlers aged 13-14 (n=24), pupils of the sports school "Mikhail Viteazul" in the city of Calares (Republic of Moldova). The athletes submitted personal data by personal consent, were acquainted with the purpose of the study and the responsibility of the research group. The participants of the experiment had the right to terminate their participation in the study at their own request. The group of researchers confirms that they can use the results of the experiment only for scientific purposes and have no right to disclose personal data.

Organization of research. At the first stage, the analysis of scientific works in the field of training of young sambo athletes, as well as the features of the application of functional training in sports, was carried out. The purpose is to study the problem of research, to determine the most promising ways to solve them. At the second stage of the study, a model of functional training of sambo athletes in the preparatory period at the stage of sports specialization was created and a pedagogical experiment was conducted. The purpose is to determine the degree of influence of functional training on the indicators of physical and technical training of sambo athletes. At the third stage, the analysis of the obtained data was carried out: mathematical processing, analysis of the results of the study, conclusions were formulated.

Statistical analysis. The obtained data were processed using the T-Student criterion (assessment of the reliability of differences between the experimental and control groups), as well as the r-Pearson pair correlation coefficient (assessment of the relationship between control exercises-tests).

Results

Rational construction of long-term training of athletes is carried out taking into account optimal age restrictions, within which the demonstration of the highest sports results is traditionally observed. It is known that the most gifted athletes can show their first great successes after 4-6 years of SAMBO training. Despite the fact that the duration of the stage of sports specialization is small, the number of tasks that need to be solved during this period of sports is very impressive: the implementation of comprehensive physical training, laying the foundations for mastering the technique in the chosen sport, as well as performing a variety of physical activities that gain experience in participating in competitions in the chosen type of martial arts, remaining part of a versatile preparation [2].

The stage of sports specialization in sambo wrestling coincides with the adolescent period of development of athletes. According to experts, the age of 13-14 years is characterized by the most complex rearrangements in the child's body. The uneven development of the cardiovascular system is an indicator of the limitation of high-intensity and prolonged loads. Hormonal changes that occur often cause a decrease in coordination of movements. In general, age is favorable for the development of strength and speed-strength indicators, however, for most coaches-teachers at the stage of sports specialization, the priority remains the comprehensive development of physical abilities and the creation of a solid base for improving the quality of sports movements [10; 19].

One of the founders of functional training in sports was Gray Cook. According to his approach, improving the quality of movements is the basis for the subsequent development of physical qualities, and only then conditions are created for acquiring sports skills. It is important to create a solid foundation on the basis of which it is possible to further increase physical activity in special exercises without losing the quality of performing motor actions. Functional stability, functional mobility and movement control are the basis of the athlete's functional training [13; 14].

In the concept of Michael Boyle, functional stability is considered as the coordinated work of local and global muscles [11]. At the stage of initial sports specialization, it is advisable to pay considerable attention to the functionality of stabilizer muscles that are not predisposed to hypertrophy. Thus, the power load should be rather educational in nature. At this stage, it is important to teach how to maintain balance in important positions for the wrestler through the competent inclusion of pastoral muscles [28]. In the future, the proportion of strength exercises involving global musculature may gradually increase in the training process in accordance with sports goals. Thus, such characteristics of the quality of an athlete's movements as muscle feeling, sense of balance and muscle control come to the fore [1; 5; 6].

The performance of technical and tactical actions in sambo wrestling is associated with the manifestation of certain indicators of flexibility. Based on the knowledge about the predominant movements of a sambo wrestler in this context, it is possible to distinguish the shoulder, hip, ankle joints, thoracic spine. According to modern data, it is important for an athlete to demonstrate not just a high amplitude of movements in the joints, but, first of all, to be able to control this mobility: to relax and strain certain muscle groups. In other words, in the process of martial arts, an athlete must make active efforts to consciously increase or decrease the range of movements in the joints. In this regard, active movements of an athlete should be the primary means of developing mobility in the educational and training process. The point is that movements performed under the control of consciousness, with the inclusion of muscles and ligaments important for the work of the joint, creates the best conditions for further use of motor experience in competitive exercises. Despite the fact that high-amplitude exercises performed in dynamic mode are more effective, sambo wrestlers should be ready to show passive flexibility, especially when it comes to defensive actions [17; 26].

The third component of functional training – movement control – consists in high indicators of coordination and dexterity of the athlete. The coordination complexity of technical and tactical actions in sambo, as well as the mandatory conditions for the surprise of martial arts, which always require creating new solutions for motor tasks arising during the struggle, determine the special place of dexterity in the training of a wrestler. The development of dexterity should also take place in the conditions of movement training [4; 27]. Following the principles of physical education, the improvement of the ability to control movements that have a complex space-time structure, as well as movements that require the search for new motor solutions, should be carried out in stages, moving from simple to more complex. So, at the first stage it is desirable to form the ability to switch attention, then coordinate movements and only then – to rebuild and adapt them in accordance with the situation in the fighting (fig. 1).

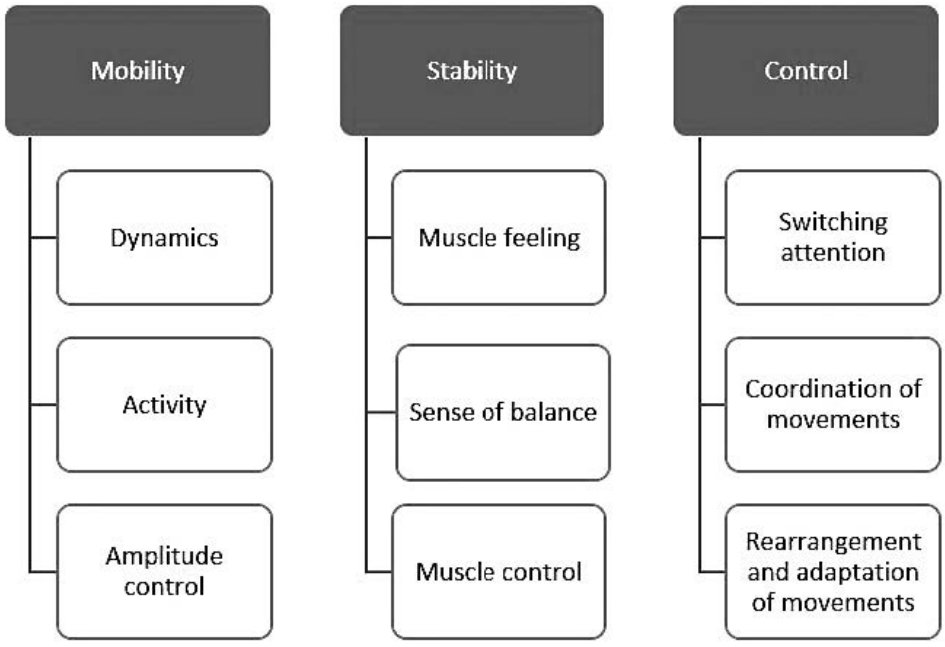

Figure 1 – Model of functional training of sambo wrestlers

Functional training of sambo wrestlers should be based on the basic principles of functional training. One of these principles is to perform exercises in a standing position. For a sambo wrestler, the ability to maintain balance in a standing position despite knocking down factors is one of the most important conditions for successful work in defense and not only. Most motor tasks in the context of general physical training should be carried out in a stand. An important condition for the high functionality of the exercises is the multi-articulation of the movements performed. The more muscle groups are represented in the tasks, the higher their functional load. Also, one of the main conditions for the functional training of a wrestler is the asymmetry of the proposed movements. Thus, favorable conditions are created for the training of an athlete to maintain balance. All motor tasks should be constantly complicated and updated, opening up new horizons of coordination difficulty [12; 15].

Based on the above, a program of functional training of sambo athletes aged 13-14 years in the preparatory period was developed. The training process included balance exercises (on one leg and in a narrow stance) with asymmetry and displacement of the center of gravity, various jumping rope, asymmetric exercises with a wrestling elastic band, exercises on the coordination ladder, games for attention and reaction. The program includes strength exercises to ensure the stability of the neck, lower back, knee and elbow joints, joints of the hands. Exercises are also offered to increase the mobility of the thoracic spine, hip, shoulder, wrist and ankle joints. The program is designed for 2 mesocycles of training. Functional training was conducted 3 times a week in a circle. The dosage and intensity of the exercises were individual for each athlete and depended on the level of training and weight category. The intensity of motor tasks is low. The purpose of the training complex is to improve the quality of the athlete's movements.

To evaluate the effectiveness of the proposed model of functional training of sambo wrestlers at the stage of sports specialization, a pedagogical experiment lasting 10 weeks was organized. The participants of the experiment were divided into two homogeneous groups. According to the experimental program of physical training, 13 sambo wrestlers of the training groups of the first year of study (13-14 years old) were engaged.

The control group consisted of 11 sambo wrestlers of the training groups of the first year of study (13-14 years). General physical training in the control group was represented by traditional sets of exercises: general developmental exercises, cross-training, strength exercises (with own body weight, partner, with weights), stretching, sports and outdoor games. The training sessions were based on high-intensity exercises and significant physical activity.

Before the experiment and after its completion, all athletes were tested to determine the initial and final level of training. The quality of the technical training of the participants of the experiment was evaluated: the time of 10 runs on the wrestling bridge (sec), the time of 10 turns on the wrestling bridge (sec), the time of 10 throws through the hip (front footrest, rebound, back) (sec). Physical fitness was also assessed: shoulder extension up: the distance from the fingers to the lower edge of the shoulder blades (cm), forward tilt in the standing position (cm), torso tilt back in the prone position: the distance from the wedge-shaped bone to the floor (cm), squat with a barbell, the weight of which is equal to the weight of the athlete (quantity), raise your straight legs to touch the grip (quantity), pull up on a low crossbar (quantity) [3; 8].

Prior to the beginning of the pedagogical experiment, no significant differences were found in the presented exercises between the experimental and control groups. The distribution of data in each of the presented indicators corresponded to the normal form. A positive pair correlation between the indicators (Pearson correlation) was also found:

– mobility of the shoulder joint and running on the wrestling bridge (r=0.778);

– mobility of the shoulder joint and coups on the wrestling bridge (r=0.712);

– mobility of the thoracic spine and running on the wrestling bridge (r=0.819);

– mobility of the thoracic spine and coups on the wrestling bridge (r=0.824);

– hip joint mobility and running on the wrestling bridge (r=0.782);

– throws through the hip with barbell squats (r=0.864), mobility of the thoracic spine and flips on the wrestling bridge by lifting straight legs (r=0.825) and pulling up on a low crossbar (r=0.780).

In general, the presented exercises-tests can serve as a tool for a comprehensive assessment of the integration of physical and technical training of sambo athletes.

After the completion of the pedagogical experiment, significant positive changes were found in all the observed indicators of physical and technical training of girls (tab. 1). At the competitions during the year, the athletes of the experimental group achieved significant results. In particular, four athletes fulfilled the standard of a candidate for master of sports. Five athletes performed the first sports category.

Table 1 – Results in activity-tests after completion of the experiment

Показник	Experimental group (n=13)			Control group (n=11)			t	p
	$\bar{x}$	S	m	$\bar{x}$	S	m		
10 races on the wrestling bridge, sec	24.4	3.3	1.1	27.3	4.4	1.5	2.2	<0.05
10 coups on the wrestling bridge, sec	32.8	4.35	1.3	34.5	4.2	1.4	2.06	<0.05
10 throws through the hip, sec	38.4	5.25	1.6	42.7	5.7	1.9	2.1	<0.05
Shoulder extension up, cm	5.5	1.1	0.4	7.5	1.8	0.6	2.9	<0.01
Leaning forward in a standing position, cm	12.6	2.4	0.6	8.7	1.9	0.6	4.1	<0.01
Tilt of the trunk back, cm	15.5	2.8	0.7	12.3	2.1	0.7	3.1	<0.01
Squat with a barbell, quantity	3.25	0.83	0.01	2.36	0.5	0.04	3	<0.01
Lifting straight legs, quantity	4.23	0.9	0.01	3.1	0.7	0.01	3.3	<0.01
Pull-up on a low crossbar, quantity	13	2.9	0.9	11	1.5	0.5	2.1	<0.05

N o t e. «*» – the differences are significant when t = 2.07 (0.05), 2.82 (0.01); df=22

Discussion

The hypothesis indicated at the beginning of the study that increasing the functionality of the exercises used can have a positive impact on the indicators of physical and technical training of sambo athletes in the preparatory period has been confirmed. In the training process of the experimental group, a choice was made in favor of low-intensity exercises aimed at restoring muscle balance, correcting asymmetry and preparing for a special preparatory period. Also, impressive volumes in the training process were replaced by classes aimed at improving the quality of general preparatory exercises. Significant positive dynamics was observed in all control exercises. It is expected that the greatest increase was revealed in the indicators of physical fitness. In the future, the condition of the athletes affected the quality of performing technical actions in sambo due to the positive transfer of skill, as well as high correlation.

It should be noted that the age of 13-14 years in girls is favorable for the development of strength and speed-strength indicators [21; 22]. In this regard, it is very valuable to improve the mobility indicators in the joints, as well as in complex coordination tasks in sambo wrestling. The complex impact of the proposed model of physical training meets the requirements of the stage of sports specialization, as well as the preparatory period of training in sambo wrestling.

Analyzing the problems of physical training in sambo wrestling and the experimental experience of this study, it can be argued that there is an effective alternative to intensive exercises, significant amounts of physical activity, as well as stereotypical tasks in the preparatory period [18]. In a whole, functional training solves a significant range of tasks: the expansion of the athlete's motor experience, the elimination of neuromuscular imbalance, the achievement of high rates of functional mobility in the joints, functional strength, and special coordination of movements.

From a practical point of view, the proposed model of physical training of sambo wrestlers in the preparatory period is the most attractive option, since it does not lead to overtraining, preserves the athlete's health and effectively solves the main tasks of the training process at the stage of sports specialization. Since the training of SAMBO wrestlers is associated with a high probability of injury, there is a need for constant modernization of the training process, including the replacement of a constant increase in physical activity with classes that contribute to improving the quality of general physical and special exercises, which, as the study showed, are aimed at future improvement of sports skills [30].

The obtained results of the study can be used everywhere in the sports training of girls aged 13-14 years engaged in sambo wrestling. The training process with the use of high-functionality exercises does not require additional funding or professional development of teachers, is based on basic knowledge in the field of sports and human health. There is a prospect of further development of scientific knowledge in this direction. In particular, it is possible to study the influence of functional training on the training of young men engaged in sambo. Also of interest is the prospect of using functional training in the preparation of wrestlers of various qualifications, as well as representatives of other sports.

Conclusions

1. In the preparatory period of sambo training at the stage of sports specialization, in exchange for high-intensity and voluminous physical activity, it is advisable to use exercises of high functionality. Exercises should reflect the main motor tasks of sambo wrestlers. Also, the requirements are multi-articulation of movements,

coordination complexity, variety and performance mainly in a standing position.

2. The model of functional training of sambo wrestlers aged 13-14 years includes mobility, stability and control of the wrestler's movements. Mobility involves the use of active, dynamic movements with a high amplitude in the joints, which is well controlled by the athlete. Stability means the use of strength exercises aimed at improving static and dynamic balance, as well as increasing control over muscle contraction. Movement control is carried out due to the variety of motor tasks and their constant complication. First, the exercises should be aimed at developing the ability to switch attention, then coordinate movements and then adapt and rearrange movements depending on the motor task.

3. It has been experimentally proved that the use of exercises with high functional value in the preparatory period of training sambo athletes aged 13-14 years at the stage of sports specialization has a more pronounced effect on the indicators of physical and technical training of athletes, in contrast to the traditional methodology based on large amounts of physical activity and high-intensity exercises.

Conflict of interest. The authors of the article report no conflict of interest.

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