

MOTOR-COORDINATION AND TACTICAL-PSYCHOLOGICAL BASES OF COMPLEX TRAINING OF SAMBO WRESTLERS 13–15 YEARS OLD

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A study was conducted aimed at studying the influence of integration on such aspects of training in sambo wrestling as motor coordination and tactical psychological. The combination of efforts and the synergistic effect were the basis of the hypothesis about the possible improvement of various aspects of training in Sambo wrestling. *The purpose of the study* is to improve the educational and training process in sambo wrestling at the initial stage of sports specialization on the basis of integrated training. *Research objectives.* Study of the theory and practice of training sambo wrestlers at the initial stage of sports specialization, assessment of the level of physical, technical, tactical, psychological training of sambo wrestlers at the initial stage of sports specialization and identification of existing problems, determination of the content of integrated training of sambo wrestlers at the initial stage of sports specialization, theoretical development and experimental substantiation of the methodology of integrated training of sambo wrestlers at the initial stage of sports specialization. *Conclusion.* An experiment involving 23 female athletes aged 13-15 years engaged in sambo showed that a synergistic model of training in the technique of movements of a sambo wrestler and parallel improvement of the necessary motor qualities can significantly reduce the time spent on training athletes. By stimulating certain characteristics of behavior, reactions, motives, attitudes and correcting them in the process of training and competitive activity, conditions can be created to increase the ability to think tactically effectively in the fight. The results of the pedagogical experiment were evaluated through a series of tests and control exercises. Comparison of average indicators before and after the experiment demonstrated a significant positive effect of the proposed integrated training program for sambo athletes at the initial stage of sports specialization on such training sections as physical, technical, tactical, functional and psychological.

Keywords: sambo wrestling, integrated training, sports training, physical training, technical and tactical training, psychological training.

Денис Такій, Ольга Самолюк, Тетяна Чебан. Рухово-координаційні і тактико-психологічні основи комплексної підготовки самбістів 13–15 років

Анотація. Проведено дослідження, спрямоване на вивчення впливу інтеграції на такі сторони підготовки в боротьбі самбо, як рухово-координаційна і тактико-психологічна. Об'єднання зусиль і синергічний ефект були основою гіпотези про можливе поліпшення різних сторін підготовки в боротьбі самбо. *Мета дослідження* – вдосконалення навчально-тренувального процесу в боротьбі самбо на початковому етапі спортивної спеціалізації на основі інтегрованої підготовки. *Завдання дослідження.* Вивчення теорії та практики підготовки борців самбо на початковому етапі спортивної спеціалізації, оцінка рівня фізичної, техніко-тактичної, психологічної підготовки борців самбо на початковому етапі спортивної спеціалізації та виявлення існуючих проблем, визначення змісту інтегрованої підготовки борців самбо на початковому етапі спортивної спеціалізації, теоретична розробка та експериментальне обґрунтування методики інтегрованої підготовки борців самбо на початковому етапі спортивної спеціалізації. *Висновок.* Експеримент за участю 23 спортсменок у віці 13-15 років, що займаються самбо, показав, що синергічна модель навчання техніці рухів борця самбо і паралельне вдосконалення необхідних рухових якостей дозволяє значно знизити часові витрати на підготовку спортсменів. Стимулюючи ті чи інші характеристики поведінки, реакції, мотиви, відносини і коригуючи їх в процесі тренувань і змагальної діяльності можуть бути створені умови для підвищення здібностей ефективно тактично мислити в боротьбі. Результати педагогічного експерименту були оцінені за допомогою серії тестів і контрольних вправ. Порівняння середніх показників до та після експерименту продемонстрували достовірний позитивний вплив запропонованої інтегрованої програми підготовки самбісток на початковому етапі спортивної спеціалізації на такі розділи підготовки, як фізична, технічна, тактична, функціональна та психологічна.

Ключові слова: боротьба самбо, інтегрована підготовка, спортивне тренування, фізична підготовка, техніко-тактична підготовка, психологічна підготовка.

Introduction

Sambo wrestling at the present stage of its development is characterized by increasing requirements for various aspects of athletes' training. This trend is observed already at the initial stage of sports specialization in the training process of sambo wrestlers. According to the regulatory requirements, coaches are faced with the task of harmonious personal development and strengthening the health of students, as well as demonstrating the growth of sports achievements [20; 28]. These goals carry a contradiction, which can be resolved if we

understand the logical connections between the various sides of training in sambo wrestling. The difficulty lies in a special age period (puberty period of development), as well as in a relatively short stage of initial sports specialization, within which it is necessary to solve a significant number of tasks [11]. In this regard, methods of training wrestlers, which are based on integration, have become very popular [2; 7; 10].

The unification of the technical and tactical section of training in wrestling, called "technical and tactical" training, has become traditional. Attempts to integrate

psychological and physical training, technical and tactical training are also successful. Basically, the research aimed at strengthening integration in the training of wrestlers consisted in the widespread use of game and competitive methods [23; 26; 30]. However, this integration lends itself to little study, mathematical measurement of its results, as well as management by researchers.

To date, there is a need to create a model of training sambo wrestlers at the initial stage of sports specialization, which would exclude important aspects of the training process and successfully solve the task of increasing motivation for athletic achievements, health promotion, and the growth of athletic skills of athletes. This study is devoted to the study of the effectiveness of the integration of physical and coordination training, as well as psychological and tactical training of sambo athletes at the initial stage of sports specialization.

Materials and methods of research

The aim of the study is to improve the training process in Sambo wrestling at the initial stage of sports specialization on the basis of integrated training. The objectives of the study included the study of the theory and practice of training sambo wrestlers at the initial stage of sports specialization, assessment of the level of physical, technical, tactical, psychological training of sambo wrestlers at the initial stage of sports specialization and identification of existing problems, determination of the content of integrated training of sambo wrestlers at the initial stage of sports specialization, theoretical development and experimental substantiation of the methodology of integrated training of wrestlers sambo at the initial stage of sports specialization.

Theoretical research methods: analysis and synthesis of data from literary sources, comparison, deduction, induction. Empirical research methods: measurement and testing of the level of functional indicators, identification of motor abilities, assessment of the motivational sphere of the personality of athletes, statistical and pedagogical assessment of the level of results of training and competitive activities; pedagogical experiment (ascertaining and forming stages for 10 months), mathematical methods of statistical data processing.

The pedagogical experiment was conducted on the basis of the sports school "Mihai Viteazul" in the city of Calares (Republic of Moldova). The experiment was attended by pupils of the sports school of the training groups of the second year of study. The age of the participants in the experiment is 13-15 years. In the experimental (main) group, girls (n=12) were engaged. The control group was also made up of female athletes in the training groups of the second year of study (n=11).

The experiment lasted from September 2018 to June 2019 (10 months). The participants of the experiment were familiarized with the conditions of the study. Personal data of the participants of the experiment are not disclosed.

The results of the research

Sambo wrestling is a difficult coordination sport. This is a combination of complex motor structure movements with conditions characterized as unpredictable (opposition of the opponent). However, relatively simple basic exercises are also becoming more complicated, since their spatial and temporal parameters are constantly being modified and revised based on the current competitive situation [3; 4]. As a result, the actions of an athlete can constantly change and differ from those options that were performed in standard training conditions [8]. In this regard, a model of step-by-step development of the coordination of movements of a sambo wrestler has been created, following which can improve the learning process of movements.

Successful movement training is largely due to attention to the quality of movements, as well as the level of formed physical qualities [22; 29]. These conditions can be called the foundation, which is expressed in the posture, as well as the inclination in the standing position, squat, lunge, lying down, balance on one leg in various variations [13; 14]. Quality includes stability, mobility and movement control. Subsequently, the mastered sports movements should also have these characteristics [15; 16].

To implement the model, the following algorithm of actions is recommended: to designate an educational task, to begin the development of basic physical qualities (mobility, stability, movement control), to introduce special preparatory exercises into the training process, to assess the level of body control in movements necessary for mastering the technique, step-by-step study of the technique, adjustment of the level of development of physical qualities and mastery of motor actions during the execution of the reception, repeated repetition based on thinking, introduction of external and internal stimuli into the performance of a technical and tactical action, assessment of deviations from the norm during the performance of a reception in non-standard or unexpected conditions, adjustment of the level of development of physical qualities and mastery of motor actions, application of reception in competitive conditions, assessment of deviations from the norm during the performance of reception in competitive conditions, adjustment of the level of development of physical qualities and motor skills [1; 5; 6; 18] (Table 1).

Table 1 – Synergistic model of technical and physical training of sambo wrestlers at the initial stage of sports specialization

Stage	Action	Tasks of technical training	Tasks of physical training	Motor tasks	Necessary conditions	Means
An idea of the technique of movement	Approximate	Creation of a motor base for training in technical and tactical action	The development of feelings	Development of dynamics, formation of muscle feeling and ability to switch attention	Familiarity with a wide range of movements	General physical exercises
		Get experience of motor actions	Creating the necessary associations		Familiarity with the kinesiology of competitive movements, competitive intensity and duration	Special-preparatory exercises
Ability	Executive	Studying reception	Acquisition of motor skills	Development of activity, sense of balance, formation of the ability to coordinate movements	Subordination of the environment (reliance on the individual characteristics of the wrestler)	Technical and tactical action and its elements
		Securing the reception	Skill Acquisition		Reliance on thinking and interest, repeated repetition	Training fights
Skill	Control and correction	Game	Skill ownership	Skill proficiency	External and internal impact	Training fights, wrestling on assignment, games with elements of wrestling.
		Wrestling (with refereeing)	A unique combination of physical qualities		Competitive atmosphere	Training fights, competitions

The success of tactical training of a sambo wrestler at the initial stage of sports specialization largely depends on the intellectual and strong-willed qualities of the athlete. Volitional, sensual and intellectual components should be taken into account at different stages of the fighter's tactical preparation for competitions: informational, organizational and operational. The revealed connections and patterns indicate the need to integrate tactical, psychological and intellectual training of sambo wrestlers at the stage of sports specialization.

Thus, the tactical training of a sambo wrestler is feasible only with the integration of intellectual and psychological training. To analyze the implementation of tactical and eliminate mistakes after the competition, it is necessary to develop analytical and critical thinking, stimulate the motivation for success, form an attitude to sports activities, adjust pre-start mental states [11; 17]. At the stage of forming your own action plan and choosing the type of tactics, it is necessary to have non-standard thinking and creativity, as well as pay special attention to the processes of self-regulation and self-awareness of the athlete. When choosing tactics of suppression, it is important for an athlete to have courage, endurance, determination, perseverance. Maneuvering tactics require the fighter to have a lability of the nervous system

and a creative approach at the time of the fight. Disguise as a type of tactic is based on the education of the athlete's equanimity and self-control [12; 19]. Regardless of the choice of tactical actions, intellectual training includes the purposeful development of memory, attentiveness and cunning (Table 2).

Despite the relative stability of such indicators as the speed of motor reaction, dynamic balance and a complex indicator of coordination of movements (3 somersaults forward), after the completion of the pedagogical experiment, statistically significant changes were found in the presented tests. Both in the experimental and control groups, there was an increase in the results in control tasks, since all participants of the experiment actively carried out training and competitive activities.

The difference in the speed of motor reaction between the groups of subjects reached a value of 2.6 in the t-Student criterion, and 2.7 in dynamic equilibrium, which corresponds to a significance limit of 0.05. When performing 3 somersaults forward for a while, more significant differences between the groups were found, equal to an index of 3.2 according to the t-Student criterion, which, according to the tabular value, is in the significance limit of 0.01 (Table 3).

Table 2 – Model of integration of tactical, intellectual and psychological training in sambo wrestling

Stage	Volitional task	Sensory task	Intellectual task	Tactical training
Information	Analysis of your tactical arsenal	Motivation for success, attitude	Development of analytical thinking, critical thinking	Awareness of motives, determination of goals and objectives of sports (participation in competitions)
	Troubleshooting errors	Correction of pre-start mental states		The study of one's own behavior and the behavior of rivals, the study of the basics of sports psychology
Organizational	Choosing tactics	Development of self-awareness	Development of independent decision-making, depth and breadth of thinking	Setting near and distant goals, awareness of desired qualities
	Forming your own action plan	Improving self-regulation		Tasks with the search for new ways to achieve the goal
				The study of means of psychoregulation: auto-training, suggestion, concentration, relaxation
Operational	Approbation of the tactical plan «suppression»	Education of courage, endurance, determination, perseverance	Development of non-standard thinking, creative thinking, flexibility, speed, situational thinking	Fight with a deliberately stronger opponent
	Approbation of the tactical plan «maneuvering»	Development of lability, creative approach		Fighting on assignment
	Approbation of the tactical plan «disguise»	Education of equanimity, self-control		The use of «threat» and «challenge» in training meetings

Table 3 – Performance indicators of the motor analyzer in athletes after the completion of the experiment

Indicators	Experimental group (n=12)			Control group (n=11)			t	p
	\bar{x}	S	m	\bar{x}	S	m		
Speed of motor reaction, cm	18.0	1.3	0.4	19.3	1.0	0.3	2.6	<0.05
Dynamic equilibrium (c)	13.7	0.38	0.1	14.2	0.4	0.1	2.7	<0.05
3 somersaults forward (sec)	3.5	0.22	0.06	3.7	0.19	0.05	3.2	<0.01

Note. *Differences are significant when $t = 2.08$ (0.05), 2.83 (0.01); $df=21$

The active work of the participants of the experimental group in the context of motivational and psychological training during the study could not but affect the psychological reliability of the athletes. If before the beginning of the pedagogical experiment in the main group, the number of female athletes with a medium-weak and medium-strong nervous system was equal to the number of female athletes with a strong nervous system, then after the experiment was completed, no female athletes with a medium-weak nervous system were found.

The number of athletes with a strong nervous system is three times higher than girls with a medium-strength nervous system. It is important to understand that any kind of sports, especially participation in competitions, can have a beneficial effect on the properties of the nervous system, making it stronger and more reliable in many indicators. In this regard, there was an increase in the number of female athletes with strong and medium strength of the nervous system in the control group (Fig. 1).

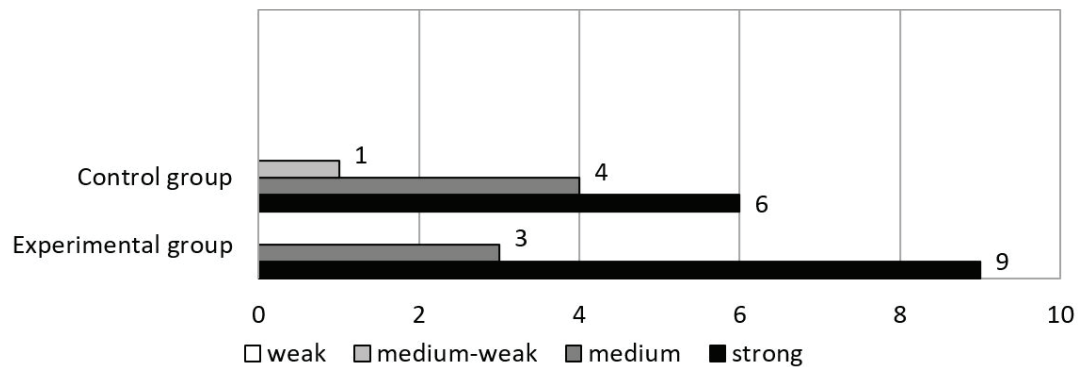


Fig. 1 – Properties of the nervous system in female athletes after the experiment

The synergistic model of motor and coordination training of sambo athletes at the initial stage of sports specialization had a beneficial effect on the complex development of strength and flexibility. The results shown at the end of the experiment in control tests indicate

the reinforcing effect of basic physical qualities: in one case – coordination of movements and strength, in the other case – coordination of movements and flexibility according to the developed synergetic model (Table 4).

Table 4 – Indicators of strength and flexibility in sambistok after completion of the experiment

Indicators	Experimental group (n=12)			Control group (n=11)			t	p
	\bar{x}	S	m	\bar{x}	S	m		
Shoulder extension up (cm)	5.8	0.9	0.3	7.1	1.3	0.4	2.6	<0.05
Forward tilt (cm)	12.4	1.0	0.3	8.9	1.3	0.4	6.8	<0.01
Tilt back (cm)	14	1.4	0.4	11.4	1.0	0.3	5.2	<0.01
Barbell squat (quantity)	3.16	0.83	0.24	2.36	0.5	0.1	2.8	<0.05
Lifting straight legs in the vise (quantity)	4.16	0.9	0.27	3.2	0.7	0.2	3.1	<0.01
Pull-up on a low crossbar (quantity)	13.3	0.7	0.2	11	0.7	0.2	3.5	<0.01

Note. *Differences are significant when $t = 2.08$ (0.05), 2.83 (0.01); $df=21$

After the completion of the pedagogical experiment, significant changes were revealed in all control exercises to evaluate the sambo technique. When performing 10 races on the wrestling bridge in the experimental group, an increase in results was noted by an average of 3 seconds. There were significant differences between the main and control groups at the level of $p < 0.01$. The greatest effectiveness was found when evaluating coups on the wrestling bridge – the value of the Student's T-test is 6.3. During the experiment period in the experimental

group, the execution time of 10 coups improved by an average of 4 seconds. A significant improvement in the results in the experimental group compared with the control group was also observed in the complex hip throw technique. The reliability of the differences is high: the value of the T-Student criterion was 3.8, which corresponds to the tabular value of $p < 0.01$. The result of performing 10 throws improved in the experimental group compared to the beginning of the experiment by an average of 4 seconds (Table 5).

Table 5 – Indicators of the quality of technical training of sambistok after the completion of the experiment

Indicators	Experimental group (n=12)			Control group (n=11)			t	p
	\bar{x}	S	m	\bar{x}	S	m		
10 races on the wrestling bridge (sec)	24.75	0.9	0.25	26.9	1.1	0.34	5.2	< 0.01
10 coups on the wrestling bridge (sec)	32	1	0.3	34.7	1	0.3	6.3	< 0.01
10 бросков через бедро (сек)	38.4	1	0.3	40.4	1.6	0.5	3.8	< 0.01

Note. *Differences are significant when $t = 2.08$ (0.05), 2.83 (0.01); $df=21$

During the experiment, the athletes took part in several competitions. Integral training of sambistok in the experimental group allowed us to see significant improvements directly in the evaluation of competitive activity by judges. The effectiveness, which consists in

the ratio between the victories won and the number of meetings held in the main group, has almost doubled. When comparing this indicator with the results of the control group participants, a significant difference was revealed at the level of $p < 0.01$ (Table 6).

Table 6 – The effectiveness of competitive activity of sambistok after the end of the experiment

Indicators	Experimental group (n=12)		Control group (n=11)		U	p
	\bar{x}	Sum of ranks	\bar{x}	Sum of ranks		
Activity (score)	0.085	175	0.07	101	35	< 0.05
Reliability of the attack (%)	55	191.5	42	84.5	18.5	<0.01
Reliability of protection (%)	90	204	70	72	6	< 0.01
Variety of attacks (%)	37.5	181	30	95	29	< 0.05
Competition performance(%)	65	199.5	40	76.5	10.5	< 0.01

Note. *Differences are significant when $U = 38$ (0.05), 28 (0.01)

After the experiment was completed, a Roufier test was conducted again to assess the functional capabilities of the heart muscle and blood vessels in athletes of both groups. The majority of athletes had a good functional state of the heart. In some cases, in the experimental group,

the indicator reached values characteristic of excellent indicators (4 athletes). However, the Roufier test, like many functional tests, is not so sensitive. In this connection, it is important to note the process of improvement, or regression (Table 7).

Table 7 – Indicators of the Roufier functional test in the participants of the experiment

Group	Experimental group (n=12)		Control group (n=11)		U	P
	\bar{x}	Sum of ranks	\bar{x}	Sum of ranks		
Before the experiment	5.9	149	5.8	127	61	>0.05
After the experiment	5.2	127.5	5.6	148.5	49.5	>0.05

Note. *Differences are significant when $U = 38$ (0.05), 28 (0.01)

The final testing of the level of motivation for success showed that a significant increase in indicators was recorded in the experimental group. Comparison of the average values according to the Mann-Whitney criterion indicates differences at the level of $p < 0.01$. The average value in the experimental group is higher than in the

control group by more than 1.5 points. A high indicator of success motivation among the representatives of the experimental group can become a significant impetus for sports improvement and an important psychological support in sports achievements (Table 8).

Table 8 – Indicators of success motivation among the participants of the experiment

Group	Experimental group (n=12)		Control group (n=11)		U	P
	\bar{x}	Sum of ranks	\bar{x}	Sum of ranks		
Before the experiment	15.8	142	15.9	134	64	> 0.05
After the experiment	18.7	191	17	85	19	< 0.01

Note. *Differences are significant when $U = 38$ (0.05), 28 (0.01)

Discussion

The theory and practice of training Sambo wrestlers at the initial stage of sports specialization is based on those features of the age of athletes, which, on the one hand, largely restrict access to certain types of exercises and load regimes, and on the other hand, open up significant prospects for experiments [9; 21; 25]. The hypothesis indicated at the beginning of the study that the synergetic model of training sambo wrestlers can significantly increase the effectiveness of many aspects of training athletes has been confirmed. The participants of the experimental group demonstrated high sporting achievements at the end of the year – three pupils became holders of the title “Champion of the Republic of Moldova” in their age group and fulfilled the standard of a candidate for master of sports. In the training process of the experimental group, emphasis was placed on creating an optimal integrated training program for sambo wrestlers, which would contribute to the realization of the natural talents of young athletes and the consistent improvement of sports skills and abilities [24].

The analytical and empirical data of the study indicate the importance of strengthening the coordination and speed-strength training of sambo wrestlers at the stage of initial sports specialization, as well as the creation of an intellectual and psychological base for tactical training of athletes [27]. The experiment showed that when preparing young sambo athletes at the initial stage of sports specialization, it is necessary to use integrated training based on the mutually influencing effects of motor coordination and technical training, as well as psychological and tactical training. It is important to understand that the organization of the training process at the initial stage of sports specialization in sambo wrestling should be aimed primarily at creating a motor coordination base for mastering the techniques of wrestling, as well as a psychological and intellectual base for studying tactical techniques and combinations of sambo wrestling.

Conclusions

1. The synergetic model of teaching the technique of movements of a sambo wrestler and the parallel improvement of the necessary motor qualities can significantly reduce the time spent on training athletes. Consistency in such closely interrelated processes as development and training is mainly based on the greater importance of the former. Also, consistency implies the ability to regularly analyze and correct at the early stages of detecting any shortcomings in the technical training of a sambo wrestler, through the directed development of a particular physical quality.

2. Integration involves following the stages of tactical training, using complex tasks (games) in their process, as well as highly specialized means of increasing the functionality of the cognitive sphere and improving the mental status of athletes. When choosing the type of tactics of struggle, it is not enough to start from the intellectual abilities inherent in nature and the characteristics of the character of the pupil. In adolescence, the time comes for the formation of important personality traits. By stimulating certain characteristics of behavior, reactions, motives, attitudes and correcting them in the process of training and competitive activity, conditions can be created to increase the ability to think tactically effectively in the fight.

3. The results of the pedagogical experiment were evaluated through a series of tests and control exercises. Comparison of average indicators before and after the experiment demonstrated a significant positive effect of the proposed integrated training program for sambo athletes at the initial stage of sports specialization on such training sections as physical, technical, tactical, functional and psychological.

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