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FORMATION OF TECHNICAL AND TACTICAL ACTIONS OF TAEKWONDO ATHLETE 11-12 YEARS OLD

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Purpose: optimization of the process of teaching the technical and tactical actions of young taekwondo athlete of 11-12 years old.

Material and methods: in order to conduct the experiment, two groups were completed. The experimental and control groups consisted of 12 athletes each. At the beginning and at the end of the pedagogical experiment, the method of expert evaluations was used, the elements of effective and often used in competitive fights technical and tactical actions of young taekwondo players were counted. Research methods: theoretical analysis and generalization of literary sources, pedagogical observations, method of expert assessments, determination of indicators of competitive activity of young taekwondo athlete aged 11-12, methods of mathematical statistics.

Results: in the pedagogical experiment, for each athlete in the experimental group, the optimal trajectory of the shock movement was determined using the «ATAKA» computer program, in which the greatest effect of the force and speed of the impact is achieved. The introduction of an experimental training technique has allowed young taekwondo athletes to increase their competitive performance. The number of real and evaluated attacks in the study group increased by 1,9% ($t = 5,13$; $p < 0,001$) and

7% (t = 10,00; p <0,001). Attack efficiency improved by 8,6% (t = 4,35; p <0,001), the interval of attacks decreased by 9,3%, the number of net victories increased by 8,2% (t = 4,11; p <0,01), and the number of warnings decreased by 8,6% (t = 2,50; p <0,05).

Conclusions: the data obtained allowed us to conclude that the use of this technique using the «KORPUS» simulator and the «ATAKA» computer program in the taekwondo training system provides positive changes in technical and physical fitness in the experimental group compared to the control group.

Keywords: taekwondo, young taekwondo athletes, training, technical and tactical actions, training device.

Introduction

Steady growth in the number of competitions requires the athlete to significantly develop special physical qualities and competent tactical skills of the fight. The high importance of psychological training at each stage of training is due to the special importance of the attitude of a young taekwondo fighter to the results of performances at competitions of any level [5, 6].

Our proposed algorithm [3, 4] of comprehensive assessment of the level of training of young taekwondo fighters takes into account the mistakes made in demonstrating the elements of punching techniques and tactics of the fight, allows you to more objectively assess the readiness for competitive activities in the consistent implementation of the following stages:

- Assignment of athletes to one of the five qualification levels, taking into account age and seniority;

- determining the level of significance of different sections of sports training depending on the level of qualification of young taekwondo fighters;

- development of statistical and mathematical tools for comprehensive assessment of the level of sports training of young taekwondo fighters;

- attestation for qualification, counting the number of mistakes made in the implementation of control standards, and determining the integrated indicator of the level of sports fitness of a young taekwondo fighter.

The use of an integrated indicator of the level of sports preparedness of a young taekwondo fighter helps to increase the objectivity of the assessment.

Analysis of the competitive activity of a taekwondo fighter testifies that it takes place in constantly changing conditions, with a lack of time and the need to make decisions in the face of the enemy [4, 11, 12]. Young taekwondo fighters use basic techniques several times more often than everyone else. Analysis of such studies indicates the need at the appropriate stage of sports training to improve the basic technique of taekwondo and make appropriate adjustments to programs for the development and improvement of special physical training and taekwondo.

The level of technical and tactical actions of the athlete largely determines his success in the fight [1, 2]. At the same time, the achievement of maximum performance in competitive activities is directly related to the total amount of training loads, which have reached critical values [7, 8]. The latter forces coaches and athletes to look for more effective ways to train. At the initial stages of long-term training, the sports result is determined by the perfection of movements that form the basis of the technical equipment of taekwondo. Based on the results of scientific research [8, 9, 13], it can be argued that the success of young taekwondo athletes 11-12 years in competitions, mainly depends on the ability to technically perform relatively simple offensive and defensive actions, the ability to move quickly and timely. and take into account the distance to the opponent.

The purpose of the research: optimization of the process of teaching the technical and tactical actions of young taekwondo athlete of 11-12 years old.

Material and methods of research

The choice of research methods was determined by the purpose, objectives and existing requirements for pedagogical research.

The following methods are used in the work: theoretical analysis and generalization of literary sources, pedagogical observations, method of expert

assessments, determination of indicators of competitive activity of young taekwondo athletes aged 11-12, methods of mathematical statistics.

For the purpose of carrying out experiment two groups, experimental and control on 12 athletes in everyone were completed. At the beginning and at the end of the pedagogical experiment, the method of expert assessments was used, the sports training of young taekwondo fighters was assessed, and the elements of effective and often used in competitive duels technical and tactical actions were calculated.

To determine the level of technical readiness of the subjects and to determine the differences between the experimental and control groups before the experiment, a pedagogical assessment was given of kicks with rotation and without rotation in the jump. The evaluation for the execution of the blow was carried out by three judges of the I-st category on the basis of the current rules of taekwondo.

In the pedagogical experiment for each athlete in the experimental group, the optimal trajectory of the impact movement was determined using the computer program "ATTACK", within which the greatest effect of force and speed of impact is achieved.

Clarification of the conditions of the blows with the help of the technique with the use of the training device "BODY" and the computer program "ATTACK" as a means of correcting information, allowed to increase the speed, force of impact and form the correct stereotype of attacking techniques. The technique created by us corrects the information on the basis of use of the computer program "ATTACK", allows to make adjustments in structure of shock movement and to influence the final result that promotes training of blow in short term.

Special technical means promote effective development of motor abilities of the athlete, at the same time improve technical abilities, skills and physical qualities during sports training, create necessary conditions for exact control and management of the most important parameters of training loading. Thus, modeling of technical and tactical training in taekwondo with the use of training devices are relevant and require careful research and implementation in the training process of taekwondo [1, 2, 9, 10, 14].

When developing the training device "BODY" we tried:

- to develop a system of counterattack actions, which in the conditions of the knocking down factor, consists of consecutive algorithms of counterattack blows for the purpose of preparation of those who are engaged in a choice of this or that action depending on the developed tactical and technical situation;

- to teach athletes, on the basis of logical analysis of the situation, which develops in the shortest possible time to choose an adequate action or counteraction;

- to teach those involved in assessing the situation in one form or another to anticipate the development of further events, the results of the opponent's actions.

According to the experiment, separate technical and tactical tasks were simulated, offered by those who deal with the help of the training device "BODY", to improve the technique of attacking actions in the conditions of the confusing factor. For high-quality learning of practical material, we proposed a test based on the computer program "ATTACK". Thus, as a result of the pedagogical experiment, the subjects of the experimental group were offered a method of teaching the technique of attacking and counterattacking in taekwondo.

Connection of work with scientific programs, plans and topics. The study was conducted in accordance with the theme of research work KhDAFK 2016-2020 "Psycho-sensory regulation of motor activity of athletes of situational sports" (state registration number 0116U008943).

Results of the research

The proposed evaluation technology allowed us to achieve significant changes in almost all indicators of sports fitness of the experimental group of young taekwondo fighters in comparison with the control group. It was found that the taekwondo fighters of the experimental group are more effective in implementing the technical and tactical arsenal and their functional and psychological readiness in competitive duels than the athletes of the control group. The practical application of the technology developed by us to assess the sports fitness of young taekwondo fighters during the annual training cycle has increased the efficiency and effectiveness of their performances at competitions.

Thus, if at the beginning of the annual macrocycle there was no significant difference between the indicators of competitive activity between the studied groups (p> 0,05), then at the end of the experiment the best were obtained in the group in which the experimental method was used (Table 1).

In the experimental group, the number of real (t = 3,90; p <0,01) and estimated attacks (t = 9,45; p <0,001) increased compared to the control group, and the interval of attacks decreased (t = 2,54; p < 0,05) and increased the effectiveness of attacks (t = 4,72; p <0,001) and defense (t = 2,73; p <0,05), and ultimately increased the number of net victories (t = 4,52; p <0,001) (Table 1).

Table 1

Indicators of competitive activity of young taekwondo athletes 11-12 years of EG and CG after the experiment (n1 = n2 = 12)

Indicators	CG	*EG*	Reliability assessment	
	$x_1 \pm m_1$	$x_2 \pm m_2$	t	p
Number of real attacks	5,5±0,08	6,4+0,10	3,90	<0,01
Number of estimated attacks	2,5±0,09	3,7±0,09	9,45	<0,001
Attack interval (s)	48,8±0,94	45,5±0,9	2,54	<0,05
Attack efficiency (%)	45,3±1,10	53,8+1,3	4,72	<0,001
Protection efficiency (%)	45,8 ±0,90	49,9+1,2	2,73	<0,05
Number of net victories	3,0±0,12	3,8±0,13	4,52	<0,001
Number of warnings	1,2±0,03	1,2+0,06	0,00	>0,05

Along with this, the introduction of experimental training techniques allowed young taekwondo fighters to increase all indicators of competitive activity (Table 2).

The number of actual and estimated attacks increased by 1,9% (t = 5,13; p <0,001) and 7% (t = 10,00; p <0,001). The effectiveness of attacks improved by 8,6% (t = 4,35; p <0.001), and protection by 9,4% (t = 5.51; p <0,001), the interval of attacks decreased by 9,3% (t = 3, 00; p <0.05), the number of net victories increased by 8,2% (t = 4,11; p <0,01), and the number of warnings decreased by 8,6% (t = 2,50; p <0,05).

Table 2

Competitive activity indicators of young EG taekwondo players before and after the experiment (n1 = n2 = 12)

Indicators	*EG*		Reliability assessment	
	Before the experiment	After the experiment	t	p

	$x_1 \pm m_1$	$x_2 \pm m_2$		
Number of real attacks	5,6±0,12	6,4+0,10	5,13	<0,05
Number of estimated attacks	2,6±0,06	3,7±0,09	10,00	<0,05
Attack interval (s)	49,1±0,8	45,5±0,9	3,00	<0,05
Attack efficiency (%)	46,4±1,1	53,8+1,3	4,35	<0,05
Protection efficiency (%)	41,3±1,0	49,9+1,2	5,51	<0,05
Number of net victories	3,1±0,11	3,8±0,13	4,11	<0,05
Number of warnings	1,4±0,05	1,2+0,006	2,50	<0,05

In turn, the control group obtained positive results in all indicators, but their shifts are not significant (Table 3).

Table 3

The results of comparative testing of adaptation of young taekwondo fighters control (n = 12) and experimental (n = 12) groups at the end of training loads (x ± σ)

Kicks	CG	*EG*	P
	Heart rate, beats per minute		
Ap chagi	122,3±3.7	114,9±2,8	p < 0,05
Dolly Chagi	131,2±4,0	120,3±3,2	p < 0,05
Yup chagi	127,1±6,3	124,9±4,8	p > 0,05
Horo chahi	141,7±4,3	132,6±3,1	p < 0,05
Nerio chagi	138,9±4,9	129,4±2,9	p < 0,05
	VR, c		
Ap chagi	0,0,25±0,03	0,0,21±0,02	p < 0,05
Dolly Chagi	0,0,26±0,04	0,0,22±0,03	p < 0,05
Yup chagi	0,0,23±0,03	0,0,21±0,02	p < 0,05
Horo chahi	0,0,26±0,04	0,0,23±0,02	p < 0,05
Nerio chagi	0,0,25±0,04	0,0,22±0,03	p < 0,05
	AM, %		
Ap chagi	48,6±5,0	45,1±3,9	p < 0,05
Dolly Chagi	52,9±4,6	47,8±3,6	p < 0,05
Yup chagi	54,7±5,9	48,9±6,0	p < 0,05
Horo chahi	63,8±5,4	54,5±4,6	p < 0,05
Nerio chahi	79,1±5,6	73,8±3,1	p < 0,05
	IN, y.o.		
Ap chagi	286,8±39,4	237,4±29,6	p < 0,05
Dolly Chagi	423,2±52,6	276,3±42,4	p < 0,05
Yup chagi	428,7±36,8	329,4±32,2	p < 0,05
Horo chahi	694,3±32,7	576,8±33,9	p < 0,05
Nerio chahi	422,7±38,6	388,2±38,1	p < 0,05

At all stages of the experiment we determined the indicators: heart rate (HR), beats per minute; variation of heart rate (BP; amplitude of heart rate (AM),%; voltage index of regulatory systems (IN) according to RM Baevsky, conventional units

(USD) [3, 5, 6, 8].

In our opinion, the procedure for assessing the sports fitness of young taekwondo fighters should take into account the elements of effective and often used in competitive duels technical actions. As a result of the analysis of modern competitive activity of taekwondo fighters, we found that a significant number of blows in sparring athletes spend mainly four technical actions - it's "pit-chagi", "dvid-chagi", "dolio-chagi" and "nerio-chagi". They make up more than 86,3% of the total number of shots assessed by the judges in the 127 matches we surveyed. These strikes are used by taekwondo fighters mainly in all attacking and counterattacking actions, as they are most effective in competitive duels. This is due to the lack of technical, tactical and psychological training of young taekwondo fighters.

In addition to expert evaluation, we found a high degree of adaptation of young taekwondo fighters to perform special equipment, which was confirmed by a special experiment. One week before the experiment, a comparative test was performed, which assessed the physiological costs of performing motor actions in order to indirectly assess the special endurance. The control and experimental groups were asked to perform five main kicks 20 times (10 right and 10 left) after a 15-minute warm-up. The rest time before the next blow was 30 seconds. At the end of each series of strokes, the following indicators were measured: heart rate, VR, AM and IN. The results obtained are presented in table. 3.

Analysis of heart rate in the performance of percussion techniques in the control and experimental groups revealed that the young taekwondo athletes of the experimental group showed smaller values, and this indicates better functional and technical readiness.

Conclusions / Discussion

The obtained data allowed us to conclude that the use of the technique with the use of the simulator "BODY" and the computer program "ATTACK" in the system of training taekwondo players provide positive changes in technical, physical and functional training in the experimental group compared to the control group.

The advantage of the experimental technique in comparison with the traditional

one is the optimization of the process of learning motor actions in taekwondo, the development of physical and technical preparedness, which is reflected in the growth of the studied indicators, in contrast to the control group.

During the experiment, positive changes were obtained in the indicators of competitive activity of young taekwondo athletes of the control and experimental game. Thus, as in the control group the obtained results do not have significant changes, in the experimental group during the annual study significantly improved the number of real attacks ($t = 5,13$; $p < 0,001$), the number of estimated attacks ($t = 10,00$; $p < 0,001$), attack intervals ($t = 3,00$; $p < 0,05$), attack effectiveness ($t = 4,35$; $p < 0,01$), defense effectiveness ($t = 5,51$; $p < 0,001$), the number of net victories ($t = 4,11$; $p < 0,01$) and the number of warnings decreased ($t = 2,50$; $p < 0,05$).

Analysis of the VR revealed the existence of statistically significant differences in athletes of the control and experimental groups. This proves the effectiveness of our methodology, which allows you to teach technical actions faster. The indicators of AM and IN in the experimental group are also lower, which indicates that the young taekwondo fighters who trained in our program with the use of special training exercises, the reaction to special activities is not as pronounced as in the control group.

The obtained statistically significant differences in the readings of the control and experimental groups indicate that the developed method promotes faster training of young taekwondo practitioners in the technique of kicks. This indicates that the experimental technique has significantly improved the quality of the training process, reduced training time, optimized the process of learning motor actions in taekwondo, the development of physical and technical fitness, improved operational thinking of athletes and attacking techniques in taekwondo.

The introduction of an annual training process using algorithms for solving technical and tactical actions allowed young taekwondo fighters 11-12 years of the experimental group to increase the number of real and estimated attacks ($t = 5,13$; $10,00$; $p < 0,001$, respectively), attack efficiency and defense ($t = 3,00$; $p < 0,05$), and the number of warnings ($t = 2,50$; $p < 0,05$), which affected the number of net wins (t

= 4,11; p <0,01).

Prospects for further research lie in the theoretical and experimental substantiation and development of model characteristics of technical and tactical actions of qualified taekwondo athletes.

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References

1. Alekseev, A. F., Romanenko, V. V. (2004), "Improvement of methods of teaching techniques in taekwondo based on the analysis of competitive activities of qualified athletes", Slobozhans'kij naukovo-sportivnij visnik, № 9, pp. 92 - 94 (in Russ.).

2. Ananchenko, K. V., Boychenko, N. V., Pashkov, I. N. (2015), "Improvement of the combination technique of Kyokushinkai karate", Slobozhans'kij naukovo-sportivnij visnik, № 1 (45), pp. 29–33 (in Ukr.)

3. Arkania, R. A., Ananchenko, K. V. (2016), "Improving the sports training of young taekwondo fighters", Slobozhans'kij naukovo-sportivnij visnik, № 6 (56), pp. 7–11 (in Ukr.)

4. Basik, T. V., Kalashnikov, Yu. B., Shiyan, V. V. (2000), "Method of assessing the special endurance of taekwondo fighters", Theory and practice of phys. Culture: Coach: Journal in Journal, №1, p. 28. (in Russ.).

5. Golovanov, V. Yu. (1998), "Comparative analysis of the level of special training of athletes in taekwondo: The original method", Theory and practice of phys. culture: coach: magazine in magazine, № 1. pp. 34-37. (in Russ.).

6. Kashkarov, V. A., Vishnyakov, A. V., Khatkevich, K. V. (2008), "On the training and diagnosis of coordination abilities of young taekwondo fighters", Physical culture and health, №4, pp. 49- 50. (in Russ.).

7. Pashkov, I. N. (2015), "Methods for improving the coordination abilities of young taekwondo practitioners at the stage of preliminary basic training", Pedagogy,

psychology and medical and biological problems of physical education and sports, № 5, pp. 27–31. (in Russ.).

8. Romanenko, V. V. (2007), "Construction of biomechanical models of basic techniques performed by the feet for taekwondo novices", Slobozhans'kij naukovo-sportivnij visnik, 12, pp. 281-285. (in Russ.).

9. Romanenko, V. V., Rovny, A. S. (2009), "Formation of rational technique of taekwondo fighters on the basis of biomechanical analysis of techniques performed by qualified athletes", Slobozhans'kij naukovo-sportivnij visnik, № 1, pp. 102 - 108. (in Russ.).

10. Bompa, T. O. (1999), Total Training for Young Champions, Human Kinetics Publishers, 211 p. (in Eng.)

11. Capener, Steve (2000), Taekwondo: Spirit of Korea, Ministry of Culture and Tourism, Republic of Korea, 135 p. (in Eng.)

12. Foran, Bill (2001), "High-Performance Sports Conditioning USA", Human Kinetics (T), 376 p. (in Eng.)

13. Kim Sang H. (2000), Martial Arts After, Turtle Press, 345 p. (in Eng.)

14. Kraynik, Y., Mulyk, V., Perevoznik, V., & Koval, S. (2020), "The use of running and jumping exercises in special motor training of young forwards 13–14 years old", Slobozhanskyi herald of science and sport, №8(1), pp. 41-44. (in Eng.)

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