Control of technical and tactical readiness of athletes in all-style karate

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A.V. Akopyan[1]
PhD, Associate Professor **A.A. Shakhov**[1]
[1]Bunin Yelets State University, Yelets

Corresponding author: shakhov-art@yandex.ru

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Abstract

Objective of the study was to improvement of athletes control over the technical and tactical readiness of athletes in all-style karate.

Methods and structure of the study. 14 representatives of the Russian national all-style karate team took part in the pedagogical experiment, which took place during the All-Russian training camp, in preparation for the World Championship, analysis of information sources, control tests, expert assessment, mathematical and statistical methods.

Results and conclusions. The experiment made it possible to determine the current state of the theory and practice of monitoring the technical and tactical readiness of athletes in all-style karate. A promising direction of this work is the use of artificial intelligence, implemented in relevant digital resources.

Keywords: *control in sports, technical and tactical training, all-style karate.*

Introduction. Analysis of information sources, our own scientific research and personal coaching experience allows us to conclude that the theoretical and practical aspects of monitoring the technical and tactical readiness of athletes in all-style karate have not been sufficiently developed to date. Based on the research of E.M. Chumakov in sambo, we have previously developed indicators of technical and tactical readiness of karatekas, and also partially determined the corresponding model characteristics of qualified athletes [1, 2, 6]. The proposed approaches can be used in training qualified athletes, while when training beginner karatekas, it should be remembered that their technical resources are limited.

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Results of the study and discussion. According to R.A. Piloyan, at the initial stage of training, martial artists master some motor skills and technical arsenals of their sport [5]. Previously, we formulated a classification of technical actions in all-style karate in the full contact discipline, which can be relied upon in the process of control (visual, instrumental, complex) [2].

When visually assessing movement, you can use the technology used in the All-Russian Physical Culture and Sports Complex «Ready for Labor and Defense» for the «Self-Defense Without Weapons» test. Thus, points are awarded for performing a technical action: 1 point - if there are 2 errors in demonstrating the technical action; 2 points – if there is 1 error; 3 points – when performing a technique without errors [3]. For a more detailed analysis, you can use a 5- and 10-point rating system.

Let us give an example of the implementation of comprehensive monitoring of the technical readiness of 14 representatives of the Russian national team in

Results of assessing the technical preparedness of members of the Russian national team in all-style karate

Technology section	Features of the technique	Weight categories, kg				
		Men				Women
		90/90+	80	70	60	60
Punches	Number of beats in 8 s	35,3±4,2	60±4,2	37±10,1	50±7,1	31±9,6
	Total tonnage of impacts in 8 s, (cu)	3463±1081	4036,5±805,4	3526±496,6	5629,5±474	2517±445
	Average severity of punches (cu)	97,5±28	67±8,5	101,6±34,8	114,4±25,7	84,7±23,5
Kicks	Impacts on the electronic paw (point)	7,6±0,6	8,0±0,2	8,4±0,4	7,0±0,2	7,2±0,4
Fighting technique	Throws (point)	5,94±0,5	7,5±1,6	5,8±0,3	5,5±0,5	5,3±0,6

all-style karate, which took place during the All-Russian training camp, in preparation for the World Championship. Three referees were involved to assess preparedness (two of the All-Russian category and one of the first).

To assess the quality of punches, a control test was used - punches for 8 s on a dynamometer dummy KIKTEST-209-2M with a «BOXBOX» target. As a result, the number of strikes and their total tonnage were determined (table). According to the manufacturer, the device is not a measuring device (it has significant errors with the reference value of kg), but it is capable of ranking impacts according to the peak value of the pulse. In this regard, the physical parameters of the estimated impacts in the table are reflected in conventional units.

To evaluate the technique of kicks, a control test was used - kicks on an electronic paw with a KIKTEST-L5 impact force sensor. In accordance with four options for the color indication of the sensor, the blows inflicted were classified as weak, average, above average, strong (see table). The paw indicator served as a guide for the judges to understand the accuracy and force of the blow.

The throwing technique was assessed on a non-resisting partner under standard conditions (see table). Throws and kicks were assessed on a 10-point scale.

Analysis of the table allows us to note the following trends. The speed of punches in men varies in waves depending on the weight category; it reaches its maximum value in representatives of the 80 kg weight category, and the minimum in heavy categories. In terms of the «Total tonnage of blows» indicator, the largest values were shown by representatives of the 60 kg weight category, this figure was 28% less for representatives of the 80 kg weight category and 38% less for athletes in the 70 kg weight category and heavy categories. In terms of the «Average severity of impacts» indicator, the highest values were also shown by representatives of the 60 kg category, and the lowest by 80 kg. Comparing the performance of men and women of the same weight category (60 kg), we can state that the speed of technique execution and the severity of blows for men are significantly higher (by 38% and 26%, respectively) than for women. The quality of kicking technique is almost the same among representatives of different weight categories and gender. A relatively low quality of throws is observed in all subjects, which indicates the need to increase the effectiveness of teaching methods in this section of technique (see table).

A promising direction in monitoring technical readiness is the use of artificial intelligence, implemented in relevant digital resources [3]. In China, a mobile application «LeDynamics» has been developed, which is used to conduct online competitions in performing basic exercises (squats, push-ups, jumping rope, etc.). This application is not currently available on the Russian market. Artificial intelligence makes it possible to increase the accuracy of measuring certain characteristics of equipment (temporal and spatial characteristics), the speed of processing the information received, and reduce human labor. However, it can be stated that today artificial intelligence cannot be fully self-sufficient in the process of monitoring technical readiness.

Control of tactical knowledge is carried out by surveying or conducting written testing of those involved in the traditional or online way.

Control of tactical thinking in martial arts is the most difficult to implement. It can be carried out using digital and instrumental technologies that simulate the course of a fight, where the speed and correctness of decision-making is the measurement scale.

Conclusions. The conducted research made it possible to determine the current state of the theory and practice of monitoring the technical and tactical readiness of athletes in all-style karate. A promising direction of this work is the use of artificial intelligence, implemented in relevant digital resources.

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