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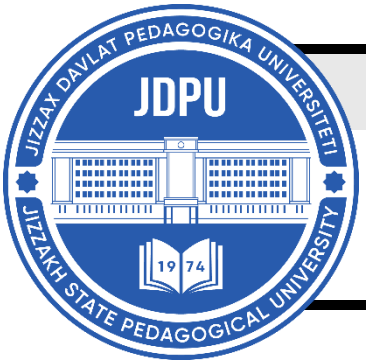

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SCIENTIFIC JUSTIFICATION OF THE DEVELOPMENT OF COMBAT MOVEMENT COMBINATIONS IN TRAINING AND COMPETITION PREPARATION OF TAEKWONDO ATHLETES

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ABOUT ARTICLE

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Abstract: This article analyzes the morphological and functional indicators of athletes engaged in taekwondo, taking into account their individual physical capabilities. The study develops approaches based on anthropometric measurements, cardiovascular and respiratory system performance indicators, as well as the results of tests evaluating the athletes' physical qualities.

Introduction

Although taekwondo was included in the Olympic Games program later than other sports, it is steadily gaining a unique status as one of the traditional Eastern martial arts, distinguished by its high speed, dynamic execution in rapidly changing situations, and aesthetic movements. Technically and tactically complex and rich, this sport has been expanding not only geographically in recent years but also in terms of the number of practitioners. In particular, the inclusion of taekwondo in the Olympic Games program gave a strong impetus to its rapid development on a global scale.

In the multi-year stages of preparation, numerous scientific and methodological resources are being developed to plan the training process, differentiate the volume and intensity of workloads according to athletes' age and skill levels, prevent fatigue caused by

training loads, and optimize recovery processes. At the same time, it remains a pressing issue to develop scientifically based recommendations regarding the regulatory requirements, assessment criteria for types of training, and model indicators used in the preparation of taekwondo athletes.

The aim of the research is to develop a methodology for improving combat movement combinations in the training and competition preparation of taekwondo athletes.

The objectives of the research are as follows:

To develop a three-stage annual training program aimed at improving combat movement combinations in the preparation of taekwondo athletes for training and competitions;

To improve combat movement combinations aimed at enhancing taekwondo athletes' special physical preparedness by utilizing strikes related to movement precision;

The object of the research is the training sessions of 14–15-year-old students specializing in taekwondo at Olympic and Paralympic training centers, focusing on their special physical and technical-tactical preparedness.

The subject of the research consists of tools and methods focused on combat movement combinations aimed at improving the special physical and technical preparedness of 14–15-year-old taekwondo athletes.

Methods: The research employed the following methods: literature analysis, pedagogical observation, surveys, video analysis, combat movement combinations, statochronometry (balance retention time), vestibulochronometry (balance retention during rotational movement exercises), pedagogical experiment, and mathematical-statistical methods.

Taekwondo is a sport that requires a high level of technical skill, agility, and precision of movement. An athlete's ability to gain an advantage over an opponent largely depends on their technical preparedness. Technical preparedness refers to the athlete's mastery of basic strikes, defensive techniques, and movement skills, as well as the ability to effectively apply them in combat situations.

Today, taekwondo is one of the most widely popularized sports globally, where technical preparedness is a decisive factor in an athlete's competitive success. In particular, the ability to correctly and effectively apply combat movement combinations defines the athlete's technical superiority. Therefore, improving combination techniques during training—while considering

the individual characteristics of athletes—is one of the most relevant directions in modern sports methodology.

Main Components of Technical Preparation

The technical preparation of a taekwondo athlete includes the following key areas:

- Basic strikes (such as chagi, yop chagi, dollyo chagi, etc.) – executing them accurately and correctly.
- Defensive movements – blocking, evading, or countering opponents' attacks.
- Combat combinations – sequences of multiple technical elements performed in logical order.
- Movement dynamics and timing – the ability to quickly respond to the opponent's actions.
- Balance and coordination – maintaining stability during movement.

Methods for Developing Technical Skills in Training

The following methods are crucial for enhancing technical preparation during training:

1. Exercises Based on Combination Movements

Forming movement automatism by making the athlete perform two or more technical elements in logical succession.

2. Individualized Approach

Teaching techniques tailored to each athlete's physical and psychological characteristics.

3. Simulated Combat Drills

Practicing with a partner to simulate real competition scenarios.

4. Video Analysis

Recording and reviewing the athlete's movements to identify and correct technical errors.

Contents of Technical Preparation

Technical preparation in taekwondo includes:

- Basic kicks (ap chagi, dollyo chagi, yop chagi, etc.)
- Defensive actions (blocks, retreats, spins)
- Combat combinations (sequences of strikes, attack-defense transitions)
- Counter-attack techniques

These techniques are directly linked to the athlete's overall movement culture, physical fitness, and psychological state.

Factors Affecting Technical Preparation

1. Coach's Approach

A combination of theoretical knowledge and practical methodology is essential for shaping proper technique.

2. Athlete's Physical Fitness

Strength, speed, agility, and balance influence the quality of technical movements.

3. Training Conditions

Modern equipment, sparring with opponents, and video analysis support technical refinement.

4. Psychological State

Confidence, motivation, and adaptability to competition conditions are crucial.

Methods for Developing Technique

- Model Drills – specially designed sets of exercises aimed at improving technical movements.
- Training with Combination Movements – repeated practice of technique sequences suited for various combat scenarios.
- Video Analysis – reviewing and correcting techniques by identifying errors.
- Individualized Training – sessions that consider each athlete's technical capabilities.

Physical preparedness is considered one of the most important factors in improving technical and tactical performance. For taekwondo athletes aged 14–16, well-structured training focused on speed, agility, flexibility, strength, and coordination leads to a significant improvement in their technical and tactical skills. This, in turn, greatly enhances both competitive outcomes and safety. The integrated development of qualities such as speed, agility, strength, motor coordination, and neuromuscular control creates a universal foundation for young athletes, increasing both the effectiveness of training and overall physical health. The experimental group of taekwondo athletes conducted their training sessions based on the methodology developed by us. At the end of the study, both the control and experimental group athletes participated in final testing using the five initially selected tests: 3x10 meter shuttle run (seconds), Standing long jump (meters), Push-ups in a support position (number of repetitions), Forward bend on a gymnastics bench (centimeters), Pull-ups on a horizontal bar (number of repetitions)

Table-1

Physical preparedness indicators of the control group taekwondo athletes at the end of the study (n=64)

T/r	TESTS	Indicators						t	P
		At the beginning of the experiment			At the end of the experiment				
		$\bar{X}$	σ	V,%	$\bar{X}$	σ	V,%		
1	3x10 meter shuttle run (seconds)	6,92	0,98	8,20	7,10	1,98	6,20	0,41	>0,05
2	Standing long jump (meters)	1,85	0,35	17,10	1,90	0,36	14,10	0,55	>0,05
3	Push-ups in a support position (repetitions)	48,13	4,17	14,22	49,10	3,10	12,22	0,92	>0,05
4	Forward bend on a gymnastics bench (centimeters)	50,64	5,18	10,34	51,34	4,19	9,40	0,52	>0,05
5	Pull-ups on a horizontal bar (repetitions)	6,24	1,48	7,68	6,34	2,47	8,68	0,17	>0,05

The difference in the performance of the control group of young taekwondo athletes in general physical fitness control tests at the beginning and end of the experiment was as follows. In the 3x10 meter shuttle run (seconds), the average result at the beginning of the experiment was 6.92 seconds, while at the end of the experiment it was 7.10 seconds.

In the standing long jump test, the average result at the beginning of the experiment was 1.85 meters, and at the end of the experiment, it was 1.90 meters. In the push-ups in a support position test, the average at the beginning was 48.13 repetitions, and at the end, it was 49.10 repetitions. In the forward bend on a gymnastics bench test, the average result at the beginning was 50.64 cm, increasing to 51.34 cm at the end. In the pull-ups on a horizontal bar test, the average result at the beginning was 6.24 repetitions, while at the end it reached 6.34 repetitions. The differences were not statistically significant ($P > 0.05$).

Table-2

Physical preparedness indicators of the experimental group taekwondo athletes at the end of the study (n=64)

T / R	TESTS	Indicators						t	P
		At the beginning of the experiment			At the end of the experiment				
		$\bar{X}$	σ	V,%	$\bar{X}$	σ	V,%		
1	3x10 meter shuttle run (seconds)	6,68	0,5	5,74	8,20	1,	6,20	3,62	< 0,01
2	Standing long jump (meters)	1,97	0,4	20,01	2,45	0,	17,10	4,36	<0,001
3	Push-ups in a support position (repetitions)	50,42	8,2	16,36	56,12	4,	14,22	3,03	< 0,01
4	Forward bend on a gymnastics bench (centimeters)	53,75	8,8	16,43	58,84	3,	10,34	2,66	< 0,05
5	Pull-ups on a horizontal bar (repetitions)	7,33	2,8	19,1	11,28	1,	7,68	4,03	<0,001

PHYSICAL FITNESS INDICATORS OF THE EXPERIMENTAL GROUP TAEKWONDO ATHLETES AT THE END OF THE STUDY (n=64)

	3x10 meter shuttle run (seconds)	Standing long jump (m)	Push-ups in a support position (repetitions)	Gimnastika o'rindig'ida oldinga egilish (sm)	Forward bend on a gymnastics bench (cm)
	1	2	3	4	5
Indicators At the beginning of the experiment	6.68	1.97	50.42	53.75	7.33
Indicators At the beginning of the experiment σ	0.58	0.46	8.25	8.83	2.87
Indicators At the beginning of the experiment V,%	5.74	20.01	16.36	16.43	19.1
Indicators At the end of the experiment V,%	8.2	2.45	56.12	58.84	11.28
Indicators At the end of the experiment σ	1.98	0.36	4.17	3.18	1.48
Indicators At the end of the experiment V,%	6.2	17.1	14.22	10.34	7.68
Indicators t V,%	3.62	4.36	3.03	2.66	4.03
Indicators P V,%	0	0	0	0	0

As we can see, the physical preparedness of the experimental group taekwondo athletes was higher. This is the result of prioritizing movement as a core component during the physical training process in the experimental group. In contrast, the physical preparedness of the taekwondo athletes in the control group was found to be significantly lower. The differences between the experimental and control groups were clear and statistically significant ($P < 0.05$).

1.Taekwondo includes numerous technical movements and tactical combat schemes. Therefore, in order to improve the comprehensive tactical and technical preparedness of taekwondo athletes, it is recommended to train them in delivering combat combination strikes across all classification groups. This will contribute to more effective performance during competitions.

2.During combat, various advantageous and disadvantageous situations may arise for taekwondo athletes. Depending on the situation, the athlete must be able to continue their movements and find a solution whether the conditions are favorable or not. For this reason, it is recommended to adopt a model for developing combat combination movement skills in both advantageous and disadvantageous situations to ensure quick decision-making.

3.At the training stage, to enhance competitive performance, it is advisable to first develop combat combination movement skills in athletes, and only then train them to execute technical actions in a coherent and interconnected manner for more effective acquisition of tactical and technical abilities.

Conclusion. The essence of testing the methodology and forming combat strike skills as a key component of technical-tactical training for taekwondo athletes was to eliminate shortcomings in organizing the training process at the initial stage. The experiment was based on the main methodological principles of sports training. However, after the experiment, some of these principles were revised and clarified to better reflect the content of the training tasks. The training methodology included the use of situational task modeling. By demonstrating different grip situations and identifying their specific characteristics, we gradually prepared the athletes for increasingly complex tasks, thereby enhancing their technical-tactical readiness. At the same time, a specific time allocation was set for forming combat combination movement skills. In the first stage of the experiment, the net training time was 40–50 minutes. In the second stage, the time devoted to forming combat combination movement skills aimed at improving competitive performance increased to 40 minutes per session. These sessions were mainly focused on refining combat actions for effective strikes. The complexity of tasks was also considered separately, with the number of successful attempts ranging from 50% to 60% of the

total. Adjustments made during training enabled the successful acquisition of combat combination movement skills and helped maintain the stability of performing the necessary technical-tactical actions.

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