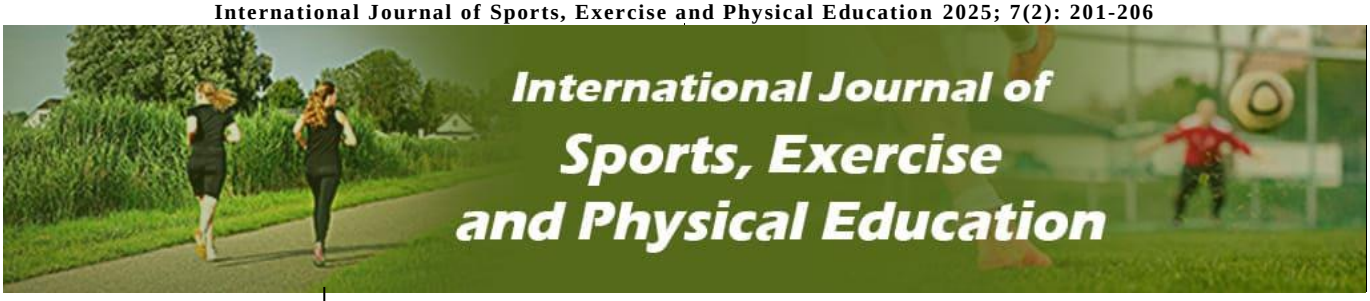

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The effect of a training program using different weights in developing the special strength and bridge skill of junior wrestling players

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Abstract
Purpose: This research aims to design and identify the effect of the using different weights training program in developing the special strength and bridge skill of junior wrestling players.
Design/methodology/approach: The experimental approach was used for two equal groups to suit the nature of the problem. The research community consisted of 30Al-Kadhimiya Sports Club wrestling players for the junior category for the 2023 season simple, random way represented by the players of Al-Kadhimiya Club. Then the research sample was randomly distributed into two groups with 10 wrestlers for each group. The training program was applied to the experimental group only. The researcher used special muscular strength tests, as well as a bridge skill performance test for wrestling player.
Findings: The results proved that the training program of different weights had a positive effect in developing the special strength and bridge skill of the experimental group in the post-test**.**The differences obtained by the control group did not rise to the level of significance, and this indicates that training using different weights was more effective than other methods.
Conclusion: The researcher recommended using different weights training program to develop aspects of special strength and the bridge skill in the training of young wrestling players.

Keywords: Bridge skill, developing special strength training program, wrestling players

Introduction

The field of athletic performance has advanced significantly, with athletes achieving remarkable feats and winning world championships. High-quality athletic training is a critical aspect of this, requiring a foundation in scientific principles. Training plans and curricula should be based on sound scientific principles to elevate the training process and develop interconnected and integrated athletic training elements. It's essential for athletes to focus on physical fitness elements like strength and speed to reach advanced positions and achieve top-level performance. Wrestling, as a combat sport, has seen a surge in media coverage and audience interest, thanks to its unique demands for high-speed performance and strength. These requirements set it apart from other sports, making it essential for athletes to meet high standards to excel in this field.

The focus of this research is on the attribute of strength, which is one of the most important physical elements in general and particularly in sports training. It is highly impactful in all athletic activities, and athletes must possess it to reach high levels and achieve the best results. An athlete distinguished by muscular strength is able to achieve a high degree of general physical capacity and fitness (Hussein, 1998) [10]. In order to reach advanced levels, it is necessary to apply various means to cover the correct physical and skill-related needs that enable the individual to achieve the required level. Physical exercises are one of the most important means relied upon to develop and enhance the training condition for the wrestler to achieve physical preparation. The diversity of exercises aimed at developing strength is reflected in the diversity of the tools used, such as weights, medicine balls, resistance bands, and others (Abdel Hamid & Hassanein, 1997) [1]. The use of resistance training is considered as one of the methods employed in the development and enhancement of speed and strength, as well as in integrating them. Research results have indicated that the use of additional weight resistance aids in strength building (Hussein, 1998) [10].

Several diverse exercises have contributed to the evolution of this sport, including the use of different weights in developing the specific strength of wrestlers and their fundamental skills (Al-Aboudi, 2012) [3]. One of these skills is the bridge technique, which is one of the fundamental skills in wrestling. The wrestler relies on five points: the hands, the feet, the front, and the back, while assuming a curved position. The importance of this research lies in the utilization of varied weight resistance exercises in developing the specific strength of wrestlers, particularly in the bridge technique, which may contribute to enhancing some physical and skilful abilities of wrestlers, ultimately enabling them to reach higher levels of performance.

Research problem

Wrestling game requires special physical elements, as is the case for all different sports activities, including explosive strength, kinetic speed, transitional speed, and speed characterized by strength. Opinions have differed regarding the use of special strength exercises with additional weights to develop these elements. Some argue that the use of additional weights in training has a positive impact on the development of these elements, but it is essential to maintain the correct motor path of performance (Hara, 1975) [8]. Wrestling coaches have found that there are differing opinions on the effectiveness of their training method and whether it is suitable for all sports activities. They believe that players need to possess specific physical abilities and be able to perceive these abilities in a way that aligns with the demands of wrestling as a combat sport. It is important for each skill in wrestling to be trained specifically and in proportion to the demands of the sport.

The research focuses on young wrestling players who are undergoing a training program that relies on the coach's personal experience rather than scientific foundations. Based on the researcher's extensive experience in wrestling as a player, administrator, coach, and referee, they have observed this issue, particularly in the training of young players. To address this, the researcher has developed a training program using varying weight loads to enhance the special strength and bridge skill of young wrestlers. The goal is to assist wrestling coaches in achieving optimal performance and reaching higher levels of accomplishment. Meetings with coaches have confirmed the existence of this problem, which leads to performance weaknesses, especially among less experienced young wrestlers. Furthermore, there is a lack of experimental scientific research on young wrestlers. These factors have motivated the researcher to conduct this study, considering the complex nature of wrestling with its multiple variables and rapid stimuli that require quick interpretation for accurate motor performance. The training for the bridge skill in wrestling necessitates coordination in movement, mastery level, effort, and muscle control, which vary based on individual strengths and weaknesses. Therefore, the research problem revolves around utilizing a training program with different weight loads to develop special strength and bridge skill in young wrestlers.

Research objectives

- Developing special strength and bridge skill in youth wrestling players using various weight training methods;
- Investigating the impact of weight training methods with different loads on the development of special strength and bridge skill in youth wrestling players.

Research hypothesis

The weight training method using different loads has a positive impact on the development of special strength and bridge skill of youth wrestling players.

Methods

Research design

Due to its suitability with the research objectives, the researcher used an experimental method with the equivalent groups design, as it is suitable for addressing the research problem. The study took place from 2/1/2023 until 6/20/2023.

Sample

The research population consisted of wrestling players from Al-Kadhimiya Sports Club in the youth category for the 2023 season. They are a total of 30 players. The researcher selected a sample of 20 players after excluding 5 players for not adhering to the training sessions and 5 players who represented the pilot study. The research sample represents 66.3% of the original population. The sample was then randomly divided into two groups, with 10 wrestlers in each group. The training program was applied only to the experimental group. Table 1 shows the mean and standard deviation of the dependent variables for assessing equivalence.

Table 1: Homogeneity and equality of the research sample

Sig.	Calculated T	Skewness	Experimental Group STD	Experimental Group Mean	Control Group STD	Control Group Mean	Measurement Unit	Variables
No	10.14	0.35	3.89	16.17	4.73	16.30	Year	Chronological age
No	1.36	0.36	1.81	4.11	1.89	4.33	Year	Training age
No	1.70	0.18	3.90	71.33	3.31	71.50	Kg	Body mass
No	1.09	0.241	4.43	79.57	4.01	80.17	Kg	Maximum strength
No	1.79	0.696	4.09	5.99	4.75	6.83	Frequency	Strength distinguished by speed
No	1.65	1.71	4.33	18.22	4.75	18.16	Frequency	Strength flexion test
No	1.78	1.11	4.09	5.80	4.53	5.86	Meter	Explosive strength of the arms

**Tabular t-value, error rate of 0.05; degree of freedom 18=2.14

Data collection: Different methods can be utilized to gather information and data. These include consulting Arabic and foreign sources, conducting internet research, conducting personal interviews, making observations and carrying out experiments, as well as conducting tests and measurements.

Instruments and equipment used
The following items are available, a medical scale, a measuring tape, a CASEO brand stopwatch, a caliper, dumbbells of various weights, a medicine ball, iron straps, a wrestling mat, and dummies of various weights.

Tests used in the research
Special muscle strength tests: Bench press test for lifting different weights (Farhat, 2001; Saleh, 2004) [7, 13].

Special muscle strength tests
- **First:** Bench press test: to lift different weights (10-15-20 kg).
- **Aim:** To measure the maximum strength of the muscles (arms and chest).
- **Equipment used:** Iron bar (10-20-30 kg), iron straps, and weight plates.
- **Performance:** The wrestler assumes a lying position on the bench with slightly opened legs. Then, the wrestler lifts the iron bar from above the iron straps, keeping the bar directly in front of the chest with a gap of approximately 80 cm between the arms. The test begins with the wrestler attempting to bend and extend the arms while carrying the weight.
- **Scoring:** The highest weight achieved for a single repetition is recorded in the laboratory.

Bench press test for maximum repetitions within 10 seconds:
- **Aim:** To perform as many repetitions as possible within 10 seconds.
- **Equipment used:** Bench press apparatus.
- **Performance:** The wrestler lies on the bench press apparatus and performs as many repetitions as possible within a 10-second time frame.

Second: Bench press test for maximum repetitions within 10 seconds:
- **Aim:** To perform as many repetitions as possible within 10 seconds.
- **Equipment used:** Bench press apparatus.
- **Performance:** The wrestler lies on the bench press apparatus and performs as many repetitions as possible within a 10-second time frame.

Third: Speed-strength test for leg muscles: Load the weight on the shoulders and perform full knee flexion and extension for a duration of 12 seconds at 70% intensity. Repeat with different weight loads.
- **Aim:** To measure the speed-strength of the leg muscles**.**
- Equipment Used: Whistle, stopwatch, bar with different weight loads, iron supports.
- **Performance**: Starting from a standing position, the wrestler lifts the bar with weights onto the shoulders and performs full knee flexion and extension, aiming to achieve the maximum number of repetitions within a 12-second timeframe.
- **Scoring:** The wrestler's score is the number of correct repetitions performed during the 12-second performance.

Fourth: The bench press test is performed by lying on a flat bench and lifting a weighted barbell for as many repetitions as possible until fatigue.
- **Aim:** To measure the strength endurance of the arm and chest muscles.
- **Tools:** Iron barbell with weights (10-15-20 kg), iron clamps, various iron plates, and a bench.
- **Performance:** The participant starts from a standing position, then places the appropriate weighted barbell on the clamps, with the intensity being approximately 70% of the maximum intensity. The test begins with the participant attempting to lift the weight, bending and extending their arms until exhaustion and inability to perform any more repetitions.
- **Scoring:** The number of repetitions achieved by the participant is counted, with only one attempt given.

Fifth: The Medicine ball throw test is performed from a standing position using medicine balls weighing 3, 5, and 7 kg. The objective of this test is to measure the explosive strength of the arm and trunk muscles. The wrestler holds the medicine ball with both hands, then throws it as far as possible using a semi-circular motion while bending the trunk forward. The arms should be flexed during the test. A chalk line or colored adhesive is used to mark the starting position for the wrestler. The test is repeated with increasing weights of medicine balls. The best attempt out of three is recorded for each laboratory (El-Mandlawy *et al*., 1989).

Six: Bridge skill test for wrestler, The Bridge Skill Test is a crucial skill in wrestling that involves five key points: the hands, feet, forehead, back, and a curved position to prevent the opponent from scoring points. The wrestler performs the test on an inclined plane with extended knees and pushed-forward feet. They bend their knees and toes forward while widening the distance between them to maintain balance. The wrestler then widens their hip center, bends their knees, and leans their trunk forward while pushing from their abdomen and feet. The wrestler's center of gravity is evenly distributed between their feet. They look back towards the mat and touch their forehead to it. The coach assists the wrestlers in performing the skill once with a partner, then corrects any mistakes.
Common errors in performing this skill include touching the shoulders to the mat, standing on the toes instead of the feet, not touching the forehead to the mat, touching the mat with the back of the head, lowering the hips too much, and not maintaining a curved position.

The survey experiment
To assess the strengths and weaknesses of the tests employed, a survey experiment was conducted on Saturday, November 2, 2023, at 6:00 PM. The experiment involved five wrestlers who were selected from the same community but were not part of the main experimental sample. The objectives of the experiment were as follows:
- Ensure the safety and security of the tests, tools, and equipment utilized.
- Verify the suitability of the testing location.
- Confirm the validity and feasibility of the tests.
- Identify any obstacles or limitations associated with the research.
- Determine the duration required for conducting the tests.

Scientific foundations of the tests

The scientific foundations of the tests are crucial for ensuring their effectiveness. One of the most important criteria for test results is reliability, which was emphasized by Rafeeq (2022) [12]. To measure reliability, the researcher calculated the test-retest reliability coefficient, which reflects the extent to which the test measures the true value of the trait it aims to measure (Majed, 2022) [11]. The physical and bridge skill tests were administered to the sample, and the same tests were re-administered after a period of 5 days. By using Pearson's correlation coefficient between the scores of the first and second tests, it was found that all tests exhibited high levels of stability. This was confirmed by the calculated values, which were all greater than the critical value of 0.87 at a degree of freedom of 18 and a significance level of 0.05, as shown in Table 2.

To assess the validity of the tests, the researcher extracted the coefficient of self-validity, which reflects the extent to which the test measures what it is intended to measure. It was found that all tests exhibited high levels of self-validity, as shown in Table 2. Regarding reliability, Pearson's correlation coefficient was calculated between the scores of the first and second judges. All proposed tests demonstrated high levels of objectivity, as all calculated values were greater than the critical value of 0.89 at a degree of freedom of 18 and a significance level of 0.05, as shown in Table 2.

Table 2: The validity, reliability and objectivity of the tests

Significant	Trustworthy	Sig.	Validity	Sig.	Reliability	Tests
Significant	0.90	Significant	0.89	Significant	0.89	Strength distinguished by speed
Significant	0.91	Significant	0.88	Significant	0.88	Maximum strength
Significant	0.90	Significant	0.88	Significant	0.88	Strength flexion test
Significant	0.97	Significant	0.88	Significant	0.88	Explosive strength of the arms
Significant	0.90	Significant	0.88	Significant	0.88	Maximum strength

Pre-tests

The pre-tests were conducted over a period of two days. On the first day, which was a Saturday on 25/2/2023, both the control and experimental groups were tested in a special strength test. On the second day, which was on 26/2/2023, a bridge skill test was conducted.

Implementation of the training program

Following the completion of the pre-tests, the researcher initiated the implementation of the training program for the experimental research group on Wednesday, March 1, 2023. The program was completed on April 14, 2023. The experimental group executed the training program with varying weights based on the repetitive training method, as well as the bridge skill. The control group executed the training program approved by the wrestling coach at Al-Kazimiyah Sports Club, in addition to other exercises included in the coach's program.

During the implementation of the training program for the experimental group, the following factors were taken into consideration:

- A general warm-up was conducted at the beginning of each training unit to prepare all muscles in the body.
- A specific warm-up was performed for the upper limb muscles using simple exercises.
- Assistant weight exercises were executed with low intensity before the main exercises in each training unit.

The researcher concluded each training unit with calming exercises and muscle relaxation, such as light jogging and cooling-down exercises. The training program lasted for six weeks, with three training units per week. The special strength of the arm and chest muscles was developed using the standing bench press exercise. The training method involved using different weights and the repetitive training approach. The unique strength of the arm and chest muscles was developed by performing more repetitions within 10 seconds using the same exercise. To develop prolonged strength in the arm and chest muscles, the bench press exercise from a flat bench was used with a sufficient number of repetitions to induce prolonged strength development, using the training method mentioned above.

Explosive strength tests for arm and trunk muscles were developed using a medicine ball throw exercise weighing 3-5-7 kg. The intensity was based on the maximum distance identified during the pre-test. There was a difference in size, intensity, and rest used in the training method between repetitions or sets. The size used ranged from 60-80%, and regarding the rest between repetitions, it was determined through a survey experiment by measuring the pulse rate and ranged between 1-1.30 minutes. As for the rest between sets, it was also determined through a survey experiment by measuring the pulse rate and ranged between 3-4 minutes.

Post-tests

After completing the training program for the experimental group, the researcher conducted post-tests on April 15, 2023. The post-tests included assessing the bridge skill in wrestling as well as measuring special strength. The researcher made sure that the post-tests were conducted at the same location and under the same conditions as the pre-tests.

Data analysis

For data analysis, the researcher used the SPSS (Version 12). Various statistical measures were employed, such as percentages, mean, standard deviation, Pearson correlation coefficient, and independent samples t-test. These statistical methods were utilized to analyze the data collected from both the pre-tests and post-tests.

Results

Control group's muscular strength

Table 3 shows results of the calculated t-values between the pre-tests and post-tests for maximum strength, explosive strength of the arms and speed-specific strength (endurance) were 1.87, 1.47, 1.01, and 2.24, respectively. These values are smaller than the critical t-value of 2.59 at a degree of freedom of 9 and a significance level of 0.05. This indicates that the differences between the pre-tests and post-tests are not statistically significant. Despite the slight improvement observed in the control group, the differences did not reach a level of significance.

Table 3: Pre- and post-tests for aspects of the control group's muscular strength

Sig.	T value (Tabulated)	T-Value (Calculated)	Post-test STD	Post-test Mean	Pre-test STD	Pre-test Mean	Statistics (Aspects of Muscular Strength)
No	2.59	1.87	3.85	84.98	4.01	80.17	Maximum strength (Kg)
	2.59	1.47	3.16	5.91	4.53	5.86	Explosive strength of the arms (Meter)
No	2.59	1.01	3.54	8.50	4.75	6.83	Strength distinguished by speed (Freq)
No	2.59	2.24	3.98	22.16	4.75	18.16	Strength flexion test (Freq)

Experimental group's muscular strength

Table 4: Pre- and post-tests for aspects of the experimental group's muscular strength

Sig.	T-Value (Tabulated)	T-Value (Calculated)	Post-test STD	Post-test Mean	Pre-test STD	Pre-test Mean	Statistics (Aspects of Muscular Strength)
Significant	2.59	7.80	2.80	91.91	4.43	79.57	Maximum strength (Kg)
Significant	2.59	4.09	2.11	7.99	5.55	5.80	Explosive strength of the arms (Meter)
Significant	2.59	4.54	2.09	9.10	4.09	5.99	Strength distinguished by speed (Freq)
Significant	2.59	6.99	2.90	26.18	4.33	18.22	Strength flexion test (Freq)

Table 4 displays the calculated value (t) for the comparison between the pre-test and post-test measures of maximum strength, explosive strength, speed-strength, and strength endurance were 7.80, 4.09, 4.54, and 6.99, respectively. These values exceed the tabulated value of 2.59 at 9 degrees of freedom with an error ratio of 0.05. This suggests that there are moral differences in the experimental group between the pre-test and post-test, with the post-test showing favorable results.

Performance of the control group in the bridge skill

Table 5: Pre- and post-tests for aspects of the control group in the bridge skill

Sig.	T-Value (Tabulated)	T-Value (Calculated)	Post-test STD	Post-test Mean	Pre-test STD	Pre-test Mean	Statistics (Level of Skill Performance)
Not Significant	2.59	1.85	0.86	7.14	0.89	6.00	Bridge skill in wrestling (degree)

Table 5 shows that the calculated t-value of 1.85 for the bridge skill of wrestling players in the control group, based on the pre-test and post-test results, is less than the critical value of 2.59. With 9 degrees of freedom and a significance level of 0.05, this suggests that there is no statistically significant difference between the two tests.

Performance of the experimental group in the bridge skill

Table 6: Pre- and post-tests for aspects of the experimental group in the bridge skill

Sig.	T-Value (Tabulated)	T-Value (Calculated)	Post-test STD	Post-test Mean	Pre-test STD	Pre-test Mean	Level of Skill Performance
Significant	2.59	5.88	0.46	9.00	0.89	6.00	Bridge skill in wrestling (degree)

Based on Table 6, the computed t-value of 5.88 for the bridge skill of wrestling players in the experimental group, derived from the pre-test and post-test outcomes, exceeds the critical value of 2.59 at a significance level of 0.05 and 9 degrees of freedom. This suggests a statistically significant disparity between the two tests, with the post-test showing favorable results.

Discussion

Based on the results in Tables (4-6), it is evident that there has been development within the experimental group, which utilized a training program incorporating varied weight loads to enhance specific strength and the bridge skill for young wrestlers. The researcher attributes this to the effectiveness of the training program implemented by the experimental group in general, which included exercises aimed at developing different aspects of muscular strength (maximum strength, explosive strength of the arms, speed-strength, and endurance strength), in addition to specific exercises aimed at improving the bridge skill for wrestlers.

The progress observed in the experimental group, which utilized varied weight loads, is a result of significant development in maximum strength, explosive strength of the arms, and speed-strength. These are crucial aspects of muscular strength, particularly in martial arts in general and wrestling specifically. Maximum strength is one of the muscular strength aspects that the results have shown to have improved to a greater extent in the group that utilized the repetitive training compared to the group that used traditional training. This can be attributed to the experimental group's reliance on high intensity, relatively low volume, and ample rest, principles that can be relied upon in developing maximum strength and subsequently improving performance in the bridge skill. As for the non-significant differences for the control group in the post-test, they can definitely be attributed to their lack of specific strength, especially as they use relatively fixed weight loads. This is consistent with what was mentioned by (the author) when he indicated that when the external resistance is greater, the importance of maximum strength increases (Abdel Maksoud, 1996) [2]. Based on the results, we can infer that the training regime, which included diverse weights and utilized the repetition method with regards to intensity, volume, and rest, was well-suited for the skill level and attributes of the wrestlers in the experimental group. This is supported by Harre, who stressed that

effective training programs are achieved when the training workload aligns with the athletes' physical capacities and is of an appropriate intensity (Hara, 1975) [8].

Certainly, this progress can be attributed to the specificity of the varied weight training, characterized by high intensity and relatively lower volume with extended rest periods. These factors are crucial in developing specific strength, which was effectively achieved through the training regimen of the experimental group. This program spanned 6 weeks with 3 training units per week, with intensities ranging from 70-90%, representing high intensities. The repetitions varied from 1-5, a relatively low number due to the high intensity, and the rest periods ranged from 2.30-3 minutes, providing an appropriate recovery ratio to replenish energy stores for achieving greater strength. The significant improvements noted in the distinctive strength speed of the arm and chest muscles resulted from the development of the maximum force output of the muscles themselves. Herbert (2012) [9] affirmed that the muscle needs the amount of resistance it faces in order for the process of acquiring and growing specific muscle strength to continue. This is achieved by increasing the amount of weight or resistance used in training once the muscle adapts to it. Additionally, training volume can be increased by increasing the number of repetitions or sets. The researcher found psychological differences in the variable of arm explosive strength, along with an evolution in maximum strength, which serves as the foundation for developing explosive strength. Developing maximum strength is essential for cultivating explosive arm strength due to its direct correlation, especially when combined with high kinetic speed that enables the release of explosive force (Al-Bostaisy, 1998) [4].

The researcher also attributes the evolution that occurred in wrestlers' performance in the bridge skill to the fact that this skill is considered one of the most challenging skills, where the focus is on a single arm of the opponent, which requires focusing on specific muscle groups during motor behavior. The researcher believes that focusing on the primary working muscles requires special strength and increasing work on the primary working muscles. With increased strength, the neural activation that results from it must provide an increase in the training effect for wrestlers (80%-90%), and the performance of skills become beneficial for the training stimulation for strength that specific exercises could be representative of this amount or increase strength beyond that (Al-Rubaie, 2000; Schmidt, 2011) [5, 14].

Conclusion

The findings indicate that the resistance training regime incorporating diverse weights positively impacted the enhancement of targeted muscle strength and the level of performance in the bridge exercise for the experimental group during the follow-up assessment. The following elements were identified: Unique speed-strength, maximum strength, endurance strength, explosive strength and bridge exercise performance level. Furthermore, the variances observed in the outcomes of the control group members suggest that the utilization of varying weights in training was more effective and advantageous compared to alternative methods. Additionally, the results have demonstrated the superior progress in specific muscle strength development and bridge exercise performance level for the experimental group over the control group during the post-assessments.

Recommendations

Based on the conclusions drawn from the research, the researcher recommends the following:-

- Utilizing training loads with varying weights to enhance specific muscle strength and the bridge skill in the training of young wrestlers.
- Emphasizing the regulation of external load components during the specialized training period for the development of specific physical and skill capabilities for young wrestlers.
- Conducting similar studies using training loads with varying weights to enhance physical and skill capabilities for other age groups of wrestlers.

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