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EFFECT OF PINCH PLATE HOLD ON FOREHAND AND BACKHAND STROKE SKILL AMONG FEMALE BADMINTON ATHLETES IN NNAMDI AZIKIWE UNIVERSITY, AWKA

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ABSTRACT

This study investigated the effect of pinch plate hold on forehand and backhand stroke skill among female badminton athletes in Nnamdi Azikiwe University Awka. The study adopted a quasi-experimental research design, pre-test, post-test and non-randomize control group. Two research questions and one null hypothesis guided the study. The population is made up of fifty female final students in Human Kinetics and Sports Science of Nnamdi Azikiwe University, Awka but thirty volunteered to participate in the study. The volunteered athletes are those who have participated within the school badminton games, were used for the study. The mean body weight of the participants was 65.30 ±17.0 kg, mean height was 5.38±0.20inches while mean age was 21.7±1.95 years. The age range 18 - 25 years was used for the study. No sample was used for the study because the population was small. The t-test, mean, standard deviation was used in the statistical analysis. The findings revealed that the pinch plate hold had a positive effect on the forehand stroke and backhand stroke of badminton athletes. The study concluded that the forehand stroke and backhand stroke will improve, with the consistent use of pinch plate hold. Based on the findings, the researcher recommends that coaches should be include pinch plate hold grip in their preparation phase training session for improving the athlete's forehand stroke and backhand stroke, whereby enhancing performance in badminton.

Keywords: Pinch plate hold, forehand stroke, backhand stroke, grip

Introduction

Badminton is a racquet sport played using racquets to hit a shuttlecock across a net in a rectangular court. The most common forms of the game are singles, whereby single players are on each side of the court and doubles, where two players are on both sides of the court. Points are scored by striking the shuttlecock with the racquet and landing it within the other team's half of the court. Each side may only strike the shuttlecock once before it passes over the net. The shuttlecock is either made of feathered or plastic which is different from the balls used in many other sports. There is no strict timeline as to the match has to finish in a certain duration of time. However, it is very common for one game of 21 to last for about 15-25 minutes and the total match of 3 games lasts about 45 to 75 minutes (Utathya, 2023). However, badminton players require repetitive movements of the arm. Badminton is all about the use of various muscles in the body, with how fast they respond to situations and reflex actions of the athletes (Rajiv, Raika, Ujawal, 2018).

A pinch plate hold is a grip strength exercise performed by holding a weight plate between the thumb and fingers for as long as you can. Plate pinches train the strength and muscular endurance of your hands, wrists, and forearms so you can use heavier weights or do more reps when you use a barbell or pull up bar for other strength exercises. According to Silverberg, (2023), the pinch plate hold is a simple way to build real strength in your forearms. Pinch plate hold exercise involves gripping a weighted plate or object between the thumb

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and fingers, engaging the muscles responsible for finger and wrist extension. This exercise primarily targets the extensor muscles of the forearm, which are crucial for stabilizing the wrist and fingers during strokes. Regularly performing pinch plate holds can enhance the strength and stability of the extensor muscles, leading to improved control and accuracy in forehand and backhand strokes.

Forearm strengthening exercises are exercises that helps in developing grip strength, stretch and strengthen the muscles crossing the hands, wrists, and elbows of athletes. It also allows a player to confidently send a shuttle back over the net, smash it, or perform any other type of hit. Badminton works with the upper and lower body to strengthen those muscle's activity in badminton players. A strength training program improves physical strength, athletic ability, and endurance. Additionally, strengthening exercise improves muscle power, balance, and coordination among athletes. In badminton, players increase the ability to hit the shuttle with more force grip may not be as tight as it should be to achieve the desired results from the training. Weakness of the forearms could be preventing an athlete from improving and strengthening other muscles in their body. Forearm strength is required for a variety of different strokes in badminton (Emily, Heather, Chris, Micky, 2023). It means that if an individual lacks that strength, grip may not be as tight and flexible as it should be to achieve the desired results from their training (Yumo, 2018). A solid grip while holding the racket is critical, which comes down to forearm strength.

Badminton forehand stroke is a shot performed during the game with a forehand grip. Forehand shots are the most powerful shots of any player, and they are the most common type of shot on the back of the court. Secondly, backhand strokes cannot be hit with as much power as forehands: the hitting action is limited by the shoulder joint, which permits a much greater range of movement for a forehand overhead than for a backhand. Based on that, the researcher wants to investigate the effect of pinch plate hold as training programs on forehand and backhand stroke skill among female badminton athletes in Nnamdi Azikiwe University Awka

Statement of Problem

Observation has shown that the gripping abilities of female badminton players especially at university level have not become what it ought to be. The poor gripping skills, lack control, co-ordination and without enough application of force in attempting forehand and backhand stroke are among the lapses observed among this group. Based on that, the researcher wants to investigate the effects of finger curl training on forehand stroke and back hand stroke among female badminton athletes in Nnamdi Azikiwe University, Awka.

Purpose of Study

The purpose of study is to investigate the effects of pinch plate hold exercises on forehand and backhand stroke among female badminton athletes in Nnamdi Azikiwe University, Awka.

Null Hypothesis

There is no significant difference on performance of forehand and backhand stroke skill

among female badminton players who were trained using pinch plate hold

Research Method and Materials

The Quasi-experimental research design was utilised for the study. It was pretest posttest non-randomised control group design. It is a design where the observations are made in the study groups before and after interventions and subjects are assigned to groups but without proper randomisation.

The area of the study is Nnamdi Azikiwe University Awka in Anambra state. There are four campuses in Nnamdi Azikiwe University

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namely; Awka, Agulu, Ifite Ogwari and Nnewi campus. For this research, Awka campus will be used for the study

Participants

The population of this study is made of all female final year students that aged 18-25 years in Human Kinetics and Sports Science of Nnamdi Azikiwe University, Awka. The population is made up of fifty female players but thirty volunteered to participate in the study. The volunteered athletes are those who have participated within the school badminton games, were used for the study. No sample was used for the study because the population was small

Instrumentation

Description of Treatment Test

Pinch Plate Hold

Aim: To train the strength and muscular endurance of hands, wrist and forearms

Facilities & Equipment: Plate weights

Procedure:

1. The participant should select the plate she wants to use and rest it on the floor next to her on its edge.
2. Grip the outside edge of the plate with your fingers on the outside and thumb closest to your body.
3. Stand up with the plate hanging down by your side.
4. Brace your core and glutes to keep your body stable throughout the exercise.
5. Pinch the plate as hard as you can during the exercise.
6. When you need to let go of the plate, lower it to the floor with control.
7. Repeat on the other side.



Picture of Pinch Plate Hold Training

Test Administration

Rally and Consistency Test

Rally and Consistency Test was used to examine the skill forehand stroke with particular emphasis on the forearm muscles. For this test, two participants were asked to stand in the both sides of the court. The rally begins and their scores were recorded

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including errors. The shuttlecock will be rallied twenty times between the players. Various procedures, equipment, facilities and purpose for a rally and consistency test in badminton were used in this study.

Purpose: The purpose of this rally and consistency test is to assess a player's forehand stroke and ability to maintain a rally while demonstrating control, accuracy, and forehand shot variety, consistently in badminton.

Facility and Equipment: Badminton court, racket, shuttlecocks, timer or stopwatch, and recording materials including a pen, a book, and smartphone for visual recording.

Procedures:

1. Set Up the Court: Prepare the badminton court by ensuring it is properly marked with boundary lines and a net is in place at the regulation height and width. And also had the camera in a strategic position
2. Warm-Up: Allow the player a few minutes to warm up by hitting forehand and backhand shots to different areas of the court to get comfortable.
3. Explain the Test: Briefly explain the purpose of the test, emphasizing that they need to maintain a rally with a partner while demonstrating the forehand stroke only.
4. Partner Selection: Pair the player being tested with a partner of similar skill level. Since multiple players are being tested, pairs are created accordingly.
5. Test Execution:
   i. The player and their partner stand on opposite sides of the court.
   ii. They start a rally by serving the shuttlecock over the net to each other.
   iii. The goal is to sustain the rally for a predetermined period of 3 minutes
   iv. Players should focus on maintaining the rally with forehand shots, using a variety of shots including clears, smashes, drops, and drives.
   v. The rally should be continuous, with minimal interruptions.
6. Counting Errors: An error occurs when the shuttlecock goes out of bounds, hits the net and does not go over, or if a player fails to return the shuttlecock within the court. Count the number of errors during the rally and the timing device is stopped as the athletes finish the rally
7. Recording Results: Record the number of successful rallies completed within the time frame and note the total errors made by both players.
8. Analysis and Feedback: Provide feedback to the players based on their performance, focusing on errors made, shot selection, and overall consistency.

Scoring:

The primary scoring for this test is based on the number of successful rallies completed within the specified time frame of 3 minutes. Fewer errors and longer, continuous rallies indicate better consistency and performance.

Scoring Steps:

1. Count Successful Rallies: Each time the players successfully complete a rally (exchange of shots back and forth over the net without errors), add one point to the score.
2. Track Errors: Keep track of errors made during the test. Common errors include hitting the shuttlecock out of bounds, hitting the net and not clearing it, or failing to return the shuttlecock within the court. Count each error separately.

Excellent	Above Average	Average	Below Average	Poor
17- Above Rallies	13-16 Rallies	9-12 Rallies	5-8 Rallies	4- Below Rallies

Assigning the subjects to Groups

All the 30 participants were who volunteer to participate for the study was gathered for grouping at the badminton court. The subjects were purposively assigned into one of the four groups: three experimental groups and Control group. They were assigned into three groups namely Group A (10) forehand stroke, Group

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B ten (10) backhand stroke and ten (10) control group. The treatment group were introduced to pinch plate hold grip as part of the training program. The training program will run for eight (8) weeks, after which a post test will be conducted. The control groups are not part of the training session for the validity of the study.

Training of Subjects

The training session lasted eight (8) weeks; three times per week. The days used for the training session in a week were Mondays, Wednesdays and Saturdays. The time for the training was 3:00pm-4:00pm (1 hour) in the evening of Mondays, Wednesdays and Sundays. There was 10 minutes warm- up, 20 minutes for the pinch plate hold grip, and later 10 minutes cooling down exercises. The researcher appointed a leader in each group members during the training session from those who best performed. The researcher demonstrated for the group to see as well as practice it well.

Method for Data Collection

The data were collected through a pre-test and post-test on forehand stroke and backhand stroke. Therefore, for this study, qualitative data collection methods were used. The field tests were rally and consistency test for forehand stroke and backhand accuracy test for backhand stroke. Tests were administrated in proper sequence on the same time of each day in a way that they can accomplish comfortably. The data were collected and recorded by the researcher.

Method of Data Analysis

The research questions were answered with arithmetic mean and standard deviation while t-test inferential statistics was also used to test for the null hypothesis. T- test was used because the Quasi-experimental design utilized in the study was not randomized and the subject were small and used intact. T-test was considered adequate for testing the hypotheses since it serves as a procedure for controlling the initial difference across the groups like height an and weight. The selected subjects were told to do some warm-up exercises ready for pre-test. The selected subjects were allowed to perform a rally and consistency test to test their forehand stroke. Then the greatest score was taken as the subject score. The second selected group carried out the backhand accuracy test to test the backhand stroke. Then all subjects had taken a pre-test firstly. The test was performed three times for the span of eight weeks.

Results

Research Question 1: How does pinch plate hold training affect the forehand stroke among female badminton athletes?

Table 1: Summary of calculated arithmetic mean and standard deviation of the pinch plate hold training on the forehand stroke among female badminton athletes.

Training Status	N	Df	Mean	SD
Pre-Test	10	9	10.30	3.945
Post-Test	10		13.40	3.934

Table 1: showed that the calculated arithmetic mean scores of female badminton players performance of forehand rally were 13.40 and 10.30 for post-test and pre-test respectively with 10 subjects each. The standard deviation from the table for the post test is 3.934 and for pre-test is 3.945. This margined in the post test and pre-test mean scores showed that the treatment has effect on performance on the forehand stroke. This implied that pinch plate hold has positive effect on performance of the forehand stroke by the female badminton player.

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Research Question 2: How does pinch plate hold training affect the skill of backhand stroke among female badminton athletes?

Table 2: Summary of calculated arithmetic mean and standard deviation of the pinch plate hold training on the backhand stroke skill of female badminton athletes.

Training Status	N	df	Mean	SD
Pre-Test	10	9	1.68	0.878
Post-Test	10		1.20	0.516

Table 2: showed that the calculated arithmetic mean scores of female badminton players performance of the backhand accuracy test were 1.20 and 1.68 for post-test and pre-test respectively with 10 subjects each. This implied that pinch plate hold has positive effect on performance of the backhand stroke by the female badminton player.

H0: There is no significant difference on performance of forehand and backhand stroke skill among female badminton players who were trained using pinch plate hold

Table 3: Summary on the performance of combined forehand and backhand stroke skill using pinch plate hold training

Groups	N	df	Mean	SD	T	P-value
Treatment	10	9	5.14	1.069	10.175	0.000
Control	10		-1.67	0.577		

Table 3, shows that that there was a statistically significant ($T = 10.175$, $p<0.05$) difference in the forehand and backhand stroke skills of participants in the treatment and control group as a result of the training undergone using pinch plate hold. This led to the rejection of the null hypothesis (H0) which states that there is no significant difference on performance of forehand and backhand stroke skill among female badminton players who were trained using pinch plate hold. The null hypothesis is therefore rejected.

Discussion

The findings on the effect of the pinch plate hold training on the forehand stroke among female badminton athletes revealed that the pinch plate hold training has positive effect on performance of the forehand stroke by the female badminton player. This finding is in agreement with that of Arulkumar and Babu, (2021), that studied the selective activation of forearm for improving wrist joint stability. Findings showed that due to the participation in the isometric conditioning and strengthening training, biomechanical stability of radio carpal and mid carpal was improved due to strengthening of forearm muscles, which is in line with this current study that showed an increase in mean score of the forehand stroke of the athlete's performance who carried out the finger curl and pinch plate hold exercises. This study in line with the views of Kusumawati, Ikhwan, Aridhotul, Loan, (2022), the results suggest that an increase in the strength of the forearm muscle can contribute to an increase in throwing velocity and an enhancement in the kinetic chain that underlies throwing in handball. However, this could be due to the increased strength and coordination of the fingers and hands, which is essential for performing a powerful and accurate backhand stroke.

The findings of the study have revealed that there is significant difference on performance of forehand and backhand stroke skill among female badminton players who were trained

using pinch plate hold. This showed that pinch plate hold training has a positive impact on performance by improving the coordination and accuracy of the forehand and backhand stroke. These findings are consistent with Bla, Denise, Torrado, Michel, Albert, (2023) these results revealed that, under maximum intensity conditions, SLOPER could stimulate the FDS and FCR better than the other grip positions at the expense of using greater loads. Similarly, maximum CRIMP dead-hang could better stimulate the FDS than the SLOPE, even when using similar loads. This result is in line with of Kusumawati, Ikhwan, Aridhotul, Loan, (2022), the results suggest that an increase in the strength of the forearm muscle can contribute to an increase in throwing velocity and an enhancement in the kinetic chain that underlies throwing in handball. This current finding showed the null hypothesis was rejected. The results showed that the improvement was at 0.05 level of statistical difference.

Conclusion

Based on the findings of the study, it was concluded that university athletes who were trained using pinch plate hold have improved forehand stroke better than those in the control group.

Athletes who were trained using pinch plate hold training have improved backhand stroke better than their counterparts in the control group.

Statically, there was significant difference in the forehand and backhand stroke of university athletes who were trained using pinch plate hold than those in the control group.

Recommendations

Based on the findings of this study these recommendations were made:

1. Since the pinch plate hold training have been found to increase the execution of the forehand stroke and backhand stroke of female athletes, there is need for coaches to include both in the training plan of athletes, as to improve their general performance in the game of badminton.
2. Coaches should understand the implications of forearm strengthening exercises responses to training and therefore imbibe a discipline to conduct the pre-exercise screening tests before commencing any sports training to avoid athletes suffering from muscular injuries.
3. Coaches and athletes should also to avoid overtraining exercises during training which could be very dangerous as it might lead to pains and injury of the muscles.

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