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THE EFFECT OF WEIGHT TRAINING *DUMBBELL SWING* USES THE OPPOSITE SIDE TO THE SKILL *FOREHAND TOPSPIN* AND *BACKHAND TOPSPIN* "PADE ANGEN MATARAM TABLE TENNIS ATHLETE IN 2024"

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ABSTRACTS

Ability forehand topspin and backhand topspin skills closely related to maturity and frequency of training. That is, to get forehand topspin and backhand topspin skills To be good, players must train intensively and in a programmed manner. This research aims to find out the effect of weight training dumbbell swing using the opposite side to the skill forehand topspin and backhand topspin. This research is experimental research by one group pre-test-post test design where in this research there was no comparison group. The population used in this research is table tennis athletes Pade Angen Mataram Table Tennis Athletes for 2024, totaling 12 players. The instrument used is a test forehand topspin dan backhand topspin. Data analysis in this study used the SPSS test. The research results were obtained there is an influence of weight training dumbbell swing use the opposite side to the skill forehand topspin, with t value $_{count}$ 12,429 > $t_{table\ (0.05)(10)}$ 2.262, a significance value of 0.000 < 0.05, and a percentage increase of 19.33%, so Ha is accepted. There is an influence of weight training dumbbell swing use the opposite side to the skill backhand topspin, with t value$_{count}$ 8,820> $t_{table(0.05)\ (10)}$ 2.262, a significance value of 0.000<0.05, and a percentage increase of 18.03%, so Ha is accepted. So it can be concluded that there is an influence of weight training dumbbell swing using the opposite side to the skill forehand topspin and backhand topspin for the 2024 Pade Angen Mataram Table Tennis Athlete.

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INTRODUCTION

Table tennis is a simple game. The movements carried out in this sport are consistently hitting, directing and placing the ball on the opponent's table and it is hoped that the opponent will not be able to return the ball. Initially this game used rubber balls, then corks and artificial rubber was used (Salim, 2008:9). One of the important hitting techniques in table tennis is drive. This technique needs to be mastered by players, it is even a mandatory technique that table tennis players must have. Initially, the game of table tennis was only known as a pastime for entertainment or simply as recreation. Currently, the game of table tennis has developed a lot, both in society, schools and universities. This game uses a table as a place to bounce the ball hit by the player. Table tennis games can be played individually or in pairs. To play table tennis, you must be able to cross the ball over the net and return the ball to your opponent's area after the ball bounces in your own area. Ability forehand topspin and backhand topspin skills closely related to maturity and frequency of

training. That is, to get forehand topspin and backhand topspin skills To be good, players must train intensively and in a programmed manner. Utama, Bandi (2004: 3) said that in table tennis matches, the ability to be precise forehand topspin and backhand topspin skills has an important role to win the competition. Topspin forehand and topspin backhand skills are the main stroke in table tennis. According to Sridadi (2004: 5), "Ball control is a form of training to familiarize yourself with the ball and the net." Players try with their handles to touch the bet to the ball, namely by bouncing the ball onto the bet for a certain amount of time, bouncing the ball with this bet can be bounced or bounced.

In the game of table tennis, you need to hit the right target because the factor of accuracy in the game of table tennis is very important in order to place a difficult ball in a direction that is difficult for your opponent to hit during a match. Therefore, players need to receive training in mastering existing training techniques from their teacher or coach. Skills forehand topspin and backhand topspin closely related to maturity and frequency of training. The solution applied is training in table tennis, according to Larry Hodges (2007: 2) training methods in table tennis include practicing with other players, practicing with a coach, practicing alone, machines and also practicing dumbbell swing. Of the various methods in table tennis, one is the training method used to improve skills: forehand topspin and backhand topspin is training dumbbell swing. This training method emphasizes hitting frequency, thereby allowing players to get used to hitting the ball at the intended target. It is hoped that the high frequency of practice by hitting the ball as much as possible will get you used to hitting the target, so that your hitting ability will increase. One of the goals of the exercise dumbbell swing is to improve your hitting ability forehand topspin and backhand topspin. In table tennis training, using dumbbell swing has been proven effective in improving hitting skills forehand topspin and backhand topspin. Dumbbell swing is used to increase the strength and speed of the arm muscles, while multi ball is used to increase the speed and accuracy of the shot. In table tennis athletes, skill forehand topspin and backhand topspin Good performance is very important to achieve victory in the match. Therefore, this study aims to test the effect of training dumbbell swing towards skills forehand topspin and backhand topspin in table tennis athletes.

Dumbbell high swing is a type of exercise that is often done by table tennis athletes to improve their hitting skills forehand topspin and backhand topspin. Dumbbell swing is an exercise that uses weight training to train strength and muscle control in the hands, stomach and arms and legs. Practice method dumbbell swing It is hoped that in the future the players will have much better hitting ability and accuracy. Based on the author's observations, no research has ever been carried out on the effect of weight training dumbbell swing using the opposite side to the skill forehand topspin and backhand topspin Pade Angen Mataram Table Tennis Athlete in 2024. Based on the background of the problem above, the problem formulation in this research is: 1) Does the influence of weight training dumbbell swing use the opposite side to the skill forehand topspin in table tennis athletes Pade Angen Mataram Table Tennis Athletes in 2024? 2) Does the influence of weight training dumbbell swing use the opposite side to the skill of backhand topspin in table tennis athletes Pade Angen Mataram Table Tennis Athletes in 2024?

RESEARCH METHOD

The design used in this research is a design or design with an experimental model. What is meant by the experimental research method is a systematic and objective way to look for a cause and effect relationship between two variables that are deliberately generated by the researcher as treatment strictly (Hulfian, 2014:9). So everything researched in this

research was done deliberately. Where in this case the players are given a training method 20 yard squared so that the player's agility can increase. Everything was done experimentally.

The research design is to use One group pretest–posttest design. In this design there is no control group, and subjects are not randomly assigned. The advantage of this design is that it is done pretest and posttest so that it can be known with certainty the differences in results due to the treatment given.

Pre- Tes	Treatment	Pos-Tes
A1	X	A2

Figure 1: *The Static Pretest-Posttest Group Design*, source (Maksum, 2009:49)

Description:

A1: *Pre-test* (hand *topspin forehand skills* and *backhand topspin* early)
X_1: Training *dumbbell swing* using opposite sides
A2: *Post-test* (hand *forehand topspin* and *backhand topspin*).

Population is a generalization area consisting of objects/subjects that have certain qualities and characteristics determined by researchers to be studied and then draw conclusions (Sugiyono, 2013: 117). So the population is not only people, but also objects and other things. Population is also not just the number of objects/subjects being studied, but includes all the characteristics/attributes possessed by that subject or object. So from the opinion above it can be concluded that what is meant by population in this research is all athletes. Pade Angen Mataram Table Tennis in 2024, totaling 12 people. The sample is part of the number and characteristics of the population. Hulfian, (2014:24). In this study, the population did not use a sample, but the entire population was used as the research sample, namely all the 2024 Pade Angen Mataram Table Tennis Athletes, totaling 12 people, so this research is a population study.

To obtain data, a measurement tool is needed, what is meant by instrument is a tool during research using a method Arikunto (2013: 192). In this study, researchers prepared to collect data by providing an understanding to athletes about the tests that would be carried out. The purpose of data collection preparation is to carry out data collection tailored to the existing problem. In this research, the preparations that must be made are the preparation of tools, preparation of materials, preparation of test participants. The instructions for carrying out the test are as follows: Tools and equipment

1. Table tennis ball
2. But
3. Tennis table
4. Stopwatch
5. Shoes shit
6. Dumbbell swing use opposite sides

Skill Accuracy Instruments *forehand topspin* and *backhand topspin* table tennis To make it easier to understand, below is a picture of table markings marking the two targets to the right of the testicles, namely an area of 30cm x 30cm, both areas are 60cm x 60cm.

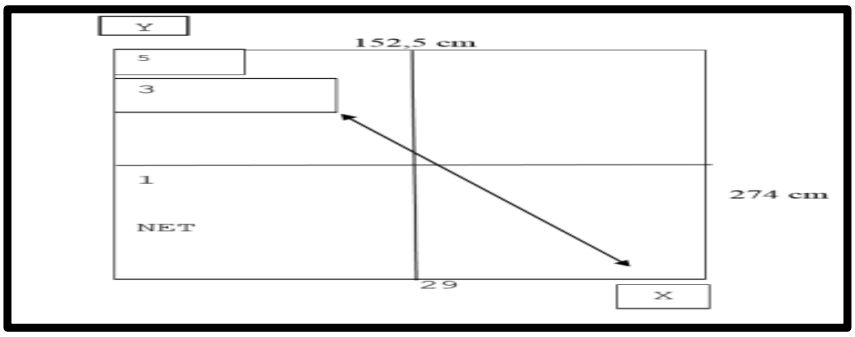

Figure 2. Instrument of hitting accuracy *forehand topspin* and *Bank hand topspin* Source: Tomoliyus (2012: 19)

Description:

X : Lyrics
Y : Feeder

1. Test instructions:
   Stage of carrying out punch accuracy tests *forehand topspin* and *backhand topspin:*
   a. Subjects are asked to warm up and practice
   b. The first ball starts from the testicles.
   c. The subject does *rally* skills *forehand topspin* and *backhand topspin* for 30 seconds. After a 10 second rest, the subject rallied again for 30 seconds.
2. Scoring instructions:
   a. Scoring is carried out by 3 people, 1 person taking notes, 1 person holding a stopwatch, and 1 person observing the ball entering the target.
   b. Balls that enter the 30 cm square target are worth 5, and balls that enter the 60 cm square area are given a value of 3, the rest of the balls that do not enter the target are worth 1.
   c. The first ball of the testes is not recorded or counted.
   d. The recorder totals the score for each rally for 30 seconds.
   e. The highest score from the 30 second rally used.

In this research, the method used to obtain this data is the documentation method and the action test method.

1. Observation Techniques

   Observation is a method of collecting data, observation is defined as a complex process, and a process composed of various biological and psychological processes (Sugiyono, 2013: 203).

2. Action Test Method

   A test is a way to conduct research on a subject or certain objects to obtain data quickly and precisely Arikunto, (2006:44). In this study, an agility test was used.

3. Documentation Techniques

   Documentation techniques in this research are used to obtain data through quantitative notes, this data can be personal or experiences written by the subject, and data obtained from direct observation is strengthened by researchers using documentation techniques in collecting data. Documentation is needed in quantitative research, because it produces valuable descriptive data and is used to process subjective aspects and results that are analyzed inductively.

After the data is collected, the next step is to analyze the data. Data analysis in this study used the t-test technique, namely by comparing the mean between the initial tests (pretest) with a final test (posttest).

1. Analysis Prerequisite Test
   a. Normality Test

      The normality test is nothing more than actually testing whether the distribution of the data to be analyzed is normal or not. Testing is carried out depending on the variables to be processed. Testing the normality of data distribution using Kolmogorov-Smirnov Test with the help of SPSS 23.

      According to method Kolmogorov-Smirnov, testing criteria are as follows:

      1) If the significance is below 0.05, it means that the data to be tested has a significant difference from standard normal data, meaning the data is not normal.
      2) If the significance is above 0.05, it means there is no significant difference between the data to be tested and standard normal data, meaning the data is normal (Gempur Safar, 2010: 34).

   b. Homogeneity Test

      In addition to testing the distribution of values to be analyzed, it is necessary to test homogeneity to be sure that the groups that form the sample come from a homogeneous population. The homogeneity test is sought using the F test of the data pretest in both groups using the help of the SPSS 23 program.

   c. Hypothesis Testing

      Hypothesis testing uses the t-test using the SPSS 23 program, namely by comparing mean between initial data (pretest) and final data (posttest). If the calculated t value is greater than the t table, then Ha is accepted. In this research, the researcher used the SPSS 23 program to test the hypothesis.

RESEARCH FINDING AND DISCUSSION

Results pretest and posttest the effect of weight training dumbbell swing use the opposite side to the skill forehand topspin and backhand topspin Pade Angen Mataram Table Tennis Athletes in 2024 are presented in table 4.1 as follows:

Table 1. Research Results Data Pretest and Posttest The effect of Weight Training Dumbbell Swing Use the Opposite Side to the Skill Forehand Topspin and Backhand Topspin Pade Angen Mataram Table Tennis Athlete in 2024

No	No	Forehand		Backhand	
		Pretest	Posttest	Pretest	Posttest
1	Saleh	37	44	22	29
2	Jamil	17	23	24	26
3	Monet	20	26	24	28
4	Fikri	24	31	21	25
5	Arman	46	52	35	41
6	Dadang	42	49	44	47
7	Sarmaki	45	47	19	25
8	Merka	28	34	22	27
9	Yusril	22	27	17	21

10	Emperor	19	25	16	19
11	Fiqri	28	34	22	27
12	Suaeb	28	34	22	27

Results of pretest descriptive statistical analysis and the effect of weight training dumbbell swing use the opposite side to the skill forehand topspin and backhand topspin The 2024 Pade Angen Mataram Table Tennis Athlete is explained as follows:

1. Pretest skills forehand topspin for Pade Angen Mataram Table Tennis Athletes in 2024, the minimum score = 17.00, the maximum score = 46.00, average (mean) = 30.00, with standard deviation (std. Deviation) = 11.39, while for posttest minimum value = 23.00, maximum value = 52.00, average (mean) = 35.80, with standard deviation (std. Deviation) =11,10.
2. Pretest backhand topspin for Pade Angen Mataram Table Tennis Athletes in 2024, the minimum score = 16.00, the maximum score = 44.00, average (mean) = 24.40, with standard deviation (std. Deviation) = 8.66, while for posttest minimum value = 19.00, maximum value = 47.00, average (mean) = 28.80, with standard deviation (std. Deviation) =8,68.

Complete results are descriptive statistics pretest and posttest skills forehand topspin and backhand topspin Pade Angen Mataram Table Tennis Athletes in 2024 are presented in table 2 as follows:

Table 2. Descriptive Statistics Pretest and Posttest Skills Forehand Topspin and Backhand Topspin at Pade Angen Mataram Table Tennis Athlete of the Year 2024

Statistics	Forehand topspin		Backhand topspin	
	Pretest	Posttest	Pretest	Posttest
N	10	10	10	10
Mean	30,0000	35,8000	24,4000	28,8000
Median	26,0000	32,5000	22,0000	26,5000
Mode	17,00[a]	23,00[a]	22,00[a]	25,00
Std, Deviation	11,39200	11,10355	8,65640	8,67692
Minimum	17,00	23,00	16,00	19,00
Maximum	46,00	52,00	44,00	47,00

Based on the description in table 2 above, pretest and posttest skills forehand topspin and backhand topspin Pade Angen Mataram Table Tennis Athletes in 2024 can be presented in Figure 3 as follows:

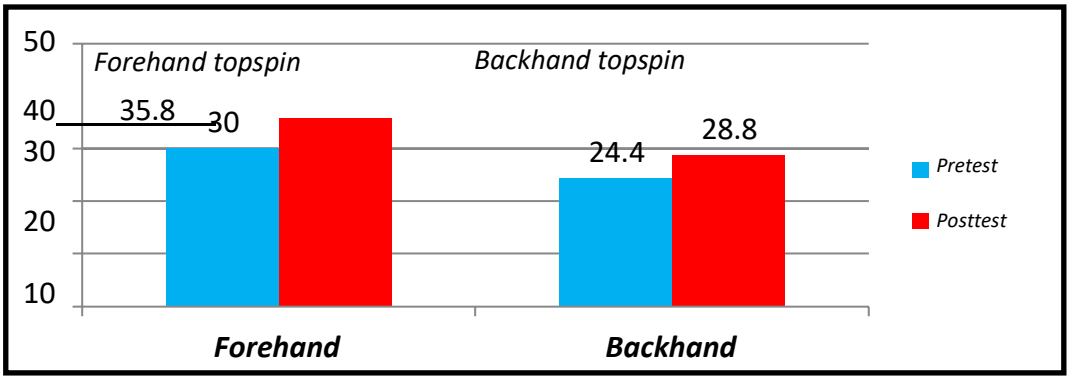

Figure 3 Bar Chart *Pretest* and *Posttest* skills *Forehand Topspin* and *Backhand Topspin* Pade Angen Mataram Table Tennis Athlete in 2024

Prerequisite Test

a. Normality Test

The normality test is intended to determine whether the variables in the study have a normal distribution or not. The calculation of this normality test uses the formula *Kolmogorov-Smirnov*, If $p > 0.05$, then it is declared normal, if $p < 0.05$ is declared abnormal. The results are presented in table 3 as follows.

Table 3. Normality Test

Group	P	Say.	Information
Pretest forehand topspin	0,815	0,05	Normal
Posttest forehand topspin	0,880	0,05	Normal
Pretest Backhand topspin	0,263	0,05	Normal
Posttest Backhand topspin	0,366	0,05	Normal

From the results of table 4.3 above, it can be seen that all data has value p (Sig.) > 0.05, and then the data is normally distributed. Because all data is normally distributed, the analysis can be continued.

b. Homogeneity Test

The homogeneity test is useful for testing the similarity of samples, namely whether or not the variance of samples taken from the population is uniform. The rule of homogeneity if $p > 0.05$, then the test is declared homogeneous, if $p < 0.05$, then the test is said to be inhomogeneous. The homogeneity test results of this research can be seen in table 4 as follows:

Table 4. Homogeneity Test

Group	df_1	df_2	Say.	Information
Pretest-Posttest forehand topspin	1	11	0,901	Homogeneous
Pretest-Posttest Backhand topspin	1	11	0,976	Homogeneous

From table 4 above the values can be seen pretest-posttest themselves. p > 0.05 so the data is homogeneous. Because the data is homogeneous, data analysis can be continued with parametric statistics.

Hypothesis Testing

a. Pretest and Posttest skills forehand topspin

The t-test is used to test the first hypothesis which reads "The effect of weight training dumbbell swing use the opposite side to the skill forehand topspin and backhand topspin for Pade Angen Mataram Table Tennis Athletes in 2024, based on results pre-test and post-test. If the results of the analysis show significant differences, then using the load dumbbell swing provides an influence on improving skills of forehand topspin. The research conclusion is declared significant if the t value $_{count}$> t $_{table}$ and value themselves smaller than 0.05 (Sig < 0.05). Based on the results of the analysis, the data in table 4.5 is obtained as follows:

Table 5. T-test Results Pre-Test and Post-Test skills Forehand topspin

Group	Flat-	t-test for Equality of means

	Flat	t ct	t tb	Say,	Difference	%
Pretest	30,000	12,429	2,262	0,000	5,80	19,33%
Posttest	35,800					

From the results of the t-test it can be seen that the t count is 12.429 and the t table is 2.262 (df10; 0.05) with a significance p value of 0.000. Because t count is 12.429 > t-table 2.262, and the significance value is 0.000 < 0.05, then this result shows that there is a significant difference. Thus the alternative hypothesis (Ha) which reads "The effect of dumbbell swing weight training using opposite sides on forehand topspin and backhand topspin skills in Pade Angen Mataram Table Tennis Athletes in 2024 is accepted." This means that the dumbbell swing weight training method provides forehand topspin and backhand topspin skills in Pade Angen Mataram Table Tennis Athletes in 2024. From the pretest data the average was 30.00, and then during the posttest the average reached 35.80. The magnitude of the increase in the accuracy of the topspin forehand stroke can be seen from the difference in the average value, namely 5.80, with a percentage increase of 19.33%.

b. Pretest and Posttest skills Backhand topspin

The t-test is used to test the first hypothesis which reads "The effect of weight training dumbbell swing uses the opposite side to the skill backhand topspin for Pade Angen Mataram Table Tennis Athletes in 2024, based on results pre-test and post-test. If the results of the analysis of Pade Angen Mataram table tennis athletes in 2024 show significant differences, then the weight training method used dumbbell swing has an influence on improving hitting skills backhand topspin. The research conclusion is declared significant if the t value $_{count}$> t $_{table}$ and value themselves smaller than 0.05 (Sig < 0.05). Based on the results of the analysis, the data in table 4.6 is obtained as follows:

Table 6. T-test Results Pre-Test and Post-Test skills Backhand topspin

Group	Flat-Flat	t-test for Equality of means				
		t ct	t tb	Say,	Difference	%
Pretest	24,400	8,820	2,262	0,000	4,40	18,03%
Posttest	28,800					

From the t-test results it can be seen that t $_{count}$ 8,820 and t $_{table}$ 2,262 $_{(df10;0,05)}$ with a significance p value of 0.000. Therefore t $_{count}$ 8,820 > t_{table} 2.262, and a significance value of 0.000 <0.05, then this result shows that there is a significant difference. Thus the alternative hypothesis (Ha) which reads "The effect of weight training dumbbell swing uses the opposite side to the skill forehand topspin and backhand topspin Pade Angen Mataram Table Tennis Athlete of 2024 was accepted. This means the weight training method dumbbell swing has an influence on improving hitting skills of the backhand topspin Pade Angen Mataram Table Tennis athlete in 2024. From data pretest has a mean of 24.40, next at the time posttest the average reached 28.80. The magnitude of the skill increase backhand topspin this can be seen from the difference in the average value, namely 4.40, with a percentage increase of 18.03%.

Based on the analysis of research data, a significant increase was obtained in the group studied. Providing weight training method treatment to dumbbell swing during 16 meetings had an influence on skills forehand topspin and backhand topspin table tennis. To find out any differences or effects of weight training dumbbell swing use the opposite side to the skill forehand topspin and backhand topspin Pade Angen Mataram Table Tennis Athletes in 2024 can be proven using the t-test. The t-test will display the size of the t-value$_{count}$ and its significance. The presence or absence of skills forehand topspin and backhand topspin table tennis after being treated with training methods dumbbell swing can be known from the average value pretest and posttest on the t-test.

The t-test results show that there is a significant effect of weight training dumbbell swing using the opposite side to the skill forehand topspin and backhand topspin for Pade Angen Mataram Table Tennis Athletes in 2024, namely 19.33% and 18.03%. Practice method dumbbell swing is one way to improve basic skills in making strokes which aims to strengthen the arm muscles so that when playing table tennis students can make good stroke accuracy. Providing training dumbbell swing an athlete must regularly experience improvement. If the load the athlete feels is light, the load must be increased. Muscles that are used to light loads must be trained by increasing the training load so that the muscles can contract optimally. In the weight training method using the dumbbell swing which is given every week increases by 10 movements. At the first meeting given every move forehand topspin and backhand topspin 45 movements then the second week of training load dumbbell swing increased to 55 moves. It is hoped that the muscles can contract optimally and be trained so that they can influence the accuracy of the blow

Weight training dumbbell swing uses the opposite side to the skill forehand topspin and backhand topspin Pade Angen Mataram Table Tennis Athletes in 2024 can improve if training is carried out in a programmed, planned and correct manner. The movements that occur in sports activities are the result of stimuli that are processed in the brain and then responded to through muscle contractions, after receiving orders from the nervous command system, namely the brain. Therefore, movement skills are always related to the internal motor system of the human body, the results of which can be observed as changes in the position of parts of the body or limbs. Movement learning is a series of association exercises or experiences that can change movement abilities towards the performance of certain movement skills. In this regard, changes in movement skills in learning movement are an indication of the process of learning movement carried out by a person. Thus, the movement skills acquired are not only influenced by movement maturity factors but also by movement learning process factors. Furthermore, movements that are carried out repeatedly will be stored in the perpetrator's memory and will appear at any time if there is the same stimulus. For this reason, movement skills in sports must always be practiced repeatedly so that they are not easily lost in memory, so that individuals remain skilled in every movement.

The increase in ability that occurs is due to the association of knowledge obtained by children at previous meetings with new knowledge and this association becomes stronger when carried out repeatedly. The more repetitions you do, the better the quality of the training will automatically be.

CONCLUSION

Based on the results of research and data analysis, the following conclusions can be drawn: 1) There is an influence of weight training dumbel swing use the opposite side to the skill forehand topspin for Pade Angen Mataram Table Tennis Athletes in 2024, with t value $_{count}$ 12,429 > $t_{table(0.05)(10)}$ 2.262, a significance value of 0.000 < 0.05, and a percentage

increase of 19.33%, so Ha is accepted.2) There is weight training dumbel swing use the opposite side to the skill backhand topspin for Pade Angen Mataram Table Tennis Athletes in 2024, with t $value_{count}$ 8,820> $t_{table(0.05)\ (10)}$ 2.262, a significance value of 0.000<0.05, and a percentage increase of 18.03%, so Ha is accepted.

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