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THE EFFECT OF WEIGHT TRAINING ON TOPSPIN SHOT ACCURACY IN CLUB PTM SASAKU PLAYERS IN 2024

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ABSTRACTS

The basic game of table tennis has three types of spin shots, namely Topspin, Sidespin and Backspin. In its application at the PTM Ssaku club, when making a Forehand Topspin shot, the quality/accuracy of the player's forehand Topspin shot is less than optimal, making it easy for the opponent to return the ball and have difficulty getting points during the match. According to some experts, topspin forehand strokes can be improved by doing weight training. This study aims to evaluate the effect of weight training on the accuracy of TopSpin forehand shots in table tennis athletes trained by the Sasaku Table Tennis Association (PTM Sasaku). The research method used was a paired sample t-test to evaluate changes in athlete performance before and after being given weight training. The population are 20 people and sample are 10 male & female Club PTM Sasaku players. The results of the analysis show that the calculated t value is greater than the t table, which indicates that there is a significant influence of weight training on the accuracy of the TopSpin forehand stroke. Based on these findings, it can be concluded that weight training tailored to the players' conditions and situations is very necessary to improve their performance. The alternative hypothesis proposed in this research was proven correct, namely that weight training has a significant influence on the accuracy of Topspin forehand strokes in table tennis athletes.

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INTRODUCTION

Sport is a physical activity that uses large muscles, in carrying out this activity which has game and competitive characteristics. These large muscles are muscles that are usually used for activities such as running, jumping and so on. In these sports activities, the perpetrator exerts maximum or almost maximum energy in physical, mental, emotional and social aspects. Physical education is an educational process that is carried out consciously and systematically through various physical activities in order to acquire physical abilities and skills, growth, intelligence and character formation. The function of physical education which prioritizes physical activities, plays a role in harmonious, harmonious and balanced emotional formation and development. Meanwhile, the aim is to help students improve their physical fitness through introducing and cultivating positive attitudes, basic movement skills and various physical activities.

Table tennis is a sport that has many fans, not limited to teenagers, but also children and the elderly, men and women who are quite interested in it, this is because this sport is not too complicated to follow. Table tennis is a sport listed in the Indonesian education curriculum. In today's sports development, table tennis is one of the sports events contested in the National Student Sports Olympiad (O2SN) at the district, provincial and

national levels. It has even been competed in international Olympics, and has earned a special place in the international world. Table tennis is a game that requires bets to hit a ball that is hit back and forth over the net and into the court.

Table tennis is played on a flat, rectangular court with a width of 1.525 meters and a length of 2.74 meters and a height of 76 cm from the floor (Simpson, 2004: 11). Along with the development and progress of the times, humans are less aware of the importance of sports activities, sports have a very important role in human life. Through sport we can form people who are physically and spiritually healthy, and can form a human character who is fair, disciplined and sportsmanlike and ultimately will form a quality human being. Sport is a physical activity that uses large muscles to carry out its activities and can produce achievements as the final limit. One of the strokes contained in the game of table tennis is the forehand and backhand strokes. In the game of table tennis, several basic playing techniques are known, including grip techniques, stance techniques, footwork techniques and stroke techniques. This basic technique is the foundation for playing table tennis. When playing table tennis, there are 3 different techniques for holding the bet. In table tennis there are two basic forces, namely the force of a blow hitting the ball, which is better known as hitting, and the other is the friction force, which is better known as swiping the ball. Apart from that, balls that are high near the net can be hit quickly, hitting other balls must be equipped with friction. Quoting the book Successfully Practicing Basic Table Tennis Skills and Assessment, by Prof, Dr. Tomoliyus, M.S, in table tennis there are three types of spin shots, namely Topspin, Sidespin and Backspin.

Due to the condition of the PTM Sasaku players when hitting the Topspin Forehand, the low or less than optimal quality/accuracy of the Topspin forehand makes it easy for the opponent to return the ball, making it difficult for the PTM Sasaku players to get points when competing. Discussing the accuracy of the Topspin forehand, it should be noted that by providing good and correct treatment, one of which is by using the shadow training method using an Iron Bet. This will have a positive impact on improving the quality/accuracy of the Topspin forehand, and not only that. Of course, the positive impact that will be obtained is that the power of the blow will increase and the ball results will be of higher quality. This shows a lack of attention and guidance from the coach in focusing on the quality and accuracy of the strokes of the Club PTM Sasaku players, so far the coach has not implemented good training methods, the coach only passes a lot of balls to the Club PTM Sasaku players who can only do Topspin Forehand shots without paying attention to the quality. and the accuracy of the blow. Based on the results of the observations above, researchers are interested in conducting research on "The Effect of Weight Training on the Accuracy of Table Tennis Topspin Shots in Club PTM Sasaku Players in 2024".

RESEARCH METHOD

The type of research used is experimental research. Because this research method is the most productive, because if the research is carried out well it can answer the actual hypothesis.

1. Research Variables
   a) The independent variable is: Weight Training (X)
   b) The dependent variable is Forehand Topspin Ability (Y) in table tennis.

2. Research Design S ⟹ Pretest ⟹ Treatment ⟹ Posttest

Source: Dinata (2013: 26) in Herman (2014: 34)

Description:

S	: Pretest
Sample	: Initial test of topspin forehand skills
Treatment	: Weight Training
Posttest	: Final test of topspin forehand skills

The target population is all Club PTM Sasaku players, both male and female, totaling 20 people. So what is meant by population/reachable population in this research is all Club PTM Sasaku players. And sample is meant by sample in this research is the 10 male & female Club PTM Sasaku players obtained through simple random sampling, then a pretest was carried out to determine the initial abilities of the sample before being given treatment. The experimental group will be given weight training. Research instruments are tools or facilities used by researchers to collect data so that the work is easier and the results are better, so that it is easier to process" (Arikunto, 2006: 160). The instruments used to collect data are as follows: In this study, the instrument for measuring the accuracy of forehand and backhand strokes was a table marking tool (Tomoliyus 2012). To make it easier to understand, below is a picture of the table markings (table 36 marking) markings for the two targets to the right of the testicle, namely an area of 30cm x 30cm, both areas are 60cm x 60cm

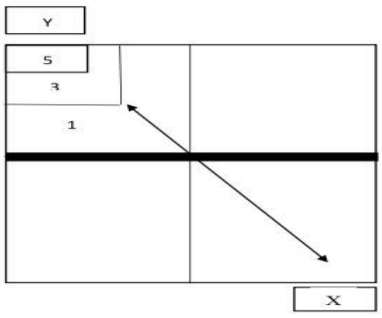

figure. 1 Instrument accuracy Forehand Topspin

Information:

A. X: Testimonial
B. Y: Feeder
   a) Test instructions: Subjects are told to warm up and do exercises. The first ball starts from the testicles. Subjects performed a diagonal forehand rally for 30 seconds. After resting for 10 seconds, the subject rallied again for 30 seconds.
   b) Scoring instructions:
   - 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.
   - Balls that enter the 30 cm square target are worth 5, and balls that enter the 60 cm square target are given a value of 3, the remaining balls that do not enter the target are worth 1.

- The first ball of the testicle is not recorded or counted.
- The recorder totals the score for each rally for 30 seconds.
- The highest score from the 30 second rally used.

The data collection technique in this research uses measurement tests. The data obtained in this research is data on the accuracy of topspin forehand shots before and after treatment with the weight training method using iron bets.

1. Exercise/Treatment Program

a) Weight training method

There are many exercise methods to strengthen arm muscles. However, in this study the muscle training used was using weights on the bets (iron bets). The weight of the iron bet is 800 grams. The way to do muscle strength training is like doing a drive shot but without using a ball, like doing the shadow movement of hitting the ball. The shape of an iron bet is the same as a regular bet, only the weight of the bet differs. Arm muscle strength training movements can be done on a table or outside a table.

Figure 2 Topspin Forehand

b) Implementation Plan

The form of treatment is 16 training sessions a week, 4 meetings, before treatment, a pre-test is carried out. After the pre-test was carried out, the treatment method was carried out using iron bets in the first week, carrying out arm muscle strength movements 50 times with forehand movements. Every week the load is increased by 10 movements. Form a movement like a forehand drive. After carrying out 16 exercises, continue with the post test measurements again. After all the data has been obtained from the pre-test and post-test, the data is processed to find out whether there is a significant increase in the accuracy of the Topspin forehand stroke or not.

Data analysis in this study used the Paired Sample T Test. The t-test was used to test the hypothesis in this research. The rule used to determine whether or not there is a significant influence is that if the t-count value is greater than the t-table (t-count > t-table) then Ho is rejected and if the t-count value is smaller than the t-table (t- count < t-table) then Ha is accepted (Santosa and Ashari, 2005: 34). The magnitude of the comparative coefficient using the "t" test is given the symbol t_o (t observation), the number can have a positive or negative sign. "However, a negative sign is not an algebraic sign, but can be interpreted as a difference in degrees of difference" (Hartono, 2004: 166).

1. T-Test Formula

The T-test formula aims to estimate the actual attenuation between the means of two groups by using the ratio of the attenuation of the group means over the combined

standard error of the two groups. Testing of this statistical data can be done with the SPSS application, Excel, and also calculating manually and in this research using the SPSS application using the T-Test calculation formula below:

$$t = \frac{\overline{x}_1 - \overline{x}_2}{\sqrt{(s^2(\frac{1}{n_1} + \frac{1}{n_2}))}}$$

Where :

• t is the value of t

• X1 and X2 are the averages of the two groups being compared

• S2 is the pooled standard error of the two groups

• n1 and n2 are the number of observations in each group

RESEARCH FINDING AND DISCUSSION

In this research, the researcher only focused on the Forehand Topspin stroke movement possessed by each player trained by the Sasaku Table Tennis Association (PTM Sasaku). Almost all sports enthusiast communities or associations, especially the Table Tennis Association, have their own techniques and practices and ways of training their players and athletes, so that they are expected to be able to compete in the championships and tournaments they participate in, and they can achieve high achievements. they want. However, in terms of precision and accuracy of strokes, especially topspin forehand strokes, researchers assess that the players and athletes trained by the Sasaku Table Tennis Association (PTM Sasaku) have a lower level of accuracy and accuracy. Often players are not precise in executing the forehand topspin technique, so it backfires on them. This also affects the speed and accuracy of the ball's positioning and it is not uncommon for the ball to go wide beyond the line of play on the table or not be able to cross the net barrier. Therefore, researchers assess the need to apply other training methods to hone the level of accuracy and ball placement for players trained by the Sasaku Table Tennis Association (PTM Sasaku). One of them is training using a weight in the form of an iron bet. This method has often been applied by several Communities and Associations of Table Tennis Lovers that researchers have met. According to Fabian Fadly Agoes, a table tennis coach who was the coach of the Indonesian national team in the 2015 SEA Games and was also a research trainer, said "one of the table tennis technique training is to use a tool in the form of an iron bet and this technique is justified at the pre-national scale level," The function of this exercise is to increase the power and explosive power of topspin and smash movements.

This type of training is a type of training with the principle of overload. The concept of training with weights is more related to training intensity. The training load at one time must be more than before. An easy way to measure exercise intensity is to count your heart rate during exercise. In young athletes, the maximum pulse rate during exercise can reach 180-190 beats per minute. If the athlete is given more training load, then the maximum heart rate will approach the highest limit. In strength training, training with more weight means

adding heavier weights or giving more repetitions when lifting weights. According to Arif Nur Azidan, who is one of the athletes from the West Nusa Tenggara (NTB) National Sports Week (PON) team for the sport of Table Tennis in 2024, he said "the effect of training using iron bets that I feel as a player or athlete is that my hands feel stronger and more sturdy. and makes me more accurate when making topspin movements and the placement of the ball is more targeted." According to Alfian Hadi, who is one of the athletes from the West Nusa Tenggara (NTB) National Sports Week (PON) team for the 2024 Table Tennis sport, he said, "Training using iron bets has the function of making counterspin, topspin and other types of strokes when executing strokes. can be done with stronger power." According to Syifaa 'Surya Aditama, who is a pre-National Sports Week (Pra PON) athlete, "training using iron bets can increase the duration of power stroke endurance and maintain accuracy in ball placement during competition." In this research, the number of samples that will be the target sample for the paired T test is 10 athletes. Athletes will carry out two stages of testing, namely the Pre Test before weight training and after weight training. The results of the blows made are the main data for sample testing with indicators, namely the duration of the blow, the hit on target, the hit that failed and the hit that went wide. The following is data from the pre-test and post-test results of this research.

Table 1 Pre Test Results Before Being Given Weight Training

NO	PLAYER NAME	DURATION OF BOOTS	BOOTS ON GOAL	HIT FAILED	HIT WIDE	TOTAL BLOWS MADE
1	ZIDAN	5 minutes	5	10	8	23
2	RIAN	5 minutes	4	11	9	24
3	ADIT	5 minutes	4	15	10	29
4	TAUFIK	5 minutes	8	15	9	32
5	VANIA	5 minutes	2	10	8	20
6	DANANG	5 minutes	5	9	8	22
7	BANU	5 minutes	3	11	7	21
8	FAHRI	5 minutes	6	10	8	24
9	JULIUS	5 minutes	9	12	15	36
10	REVAN	5 minutes	7	17	12	36

Table 2 Post Test After being given weight training

NO	PLAYER NAME	DURATION OF BOOTS	BOOTS ON GOAL	HIT FAILED	HIT WIDE	TOTAL BLOWS MADE
1	ZIDAN	5 minutes	22	5	3	30
2	RIAN	5 minutes	20	6	6	32
3	ADIT	5 minutes	25	4	2	31
4	TAUFIK	5 minutes	21	5	3	29
5	VANIA	5 minutes	18	6	4	28
6	DANANG	5 minutes	25	4	5	34
7	BANU	5 minutes	22	5	5	32
8	FAHRI	5 minutes	30	6	4	40
9	JULIUS	5 minutes	31	7	4	42
10	REVAN	5 minutes	26	5	3	34

As for direct testing, using the data description in table 1 and the table above for the pre-test and post-test before and after being given weight training, this research uses the Paired Sample T Test. The results of the T Test of this research are as follows.

Table 3 Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre	26.70	10	6.093	1.927
	Post	33.20	10	4.566	1.444

Table 4 Paired Samples Effect Sizes

			Standardizer[a]	Point Estimate	95% Confidence Interval Lower	Upper
Pair 1	Pre - Post	Cohen's d	6.042	-1.076	-1.848	-.268
		Hedges' correction	6.309	-1.030	-1.769	-.257

a. The denominator used in estimating the effect sizes.
Cohen's d uses the sample standard deviation of the mean difference.
Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.

Table 5 Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre	26.70	10	6.093	1.927
	Post	33.20	10	4.566	1.444

In this output we are shown a summary of the descriptive statistical results of the two samples studied, namely before and after carrying out weight lifting training. For the pre-test score, the average result before lifting weights was 26.70. Meanwhile, for the post test score, the average score was 33.20. The number of respondents used in this research was 10 people. For Std values. Deviation (standard deviation) in the pre test was 6.093 and in the post test was 4.566. Finally, the Std value. The error in the mean for the pre test was 1.927 and for the post test was 1.444. Because the average score of the pre test (before weight lifting training) < than the post test (after weight lifting training) is 26.70 < 33.20. So that means that descriptively there is a difference in the average results of the pre-test and post-test or before being given weight-lifting training and after being given weight-lifting training. Next, to prove whether the difference is real (significant) or not, it is necessary to interpret the results of the paired sample t test contained in the "Paired Samples Test" output.

Table 6 Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre & Post	10	.386	.271

The output above shows the results of the correlation test or the relationship between the two data or the relationship between the pre-test and post-test variables. Based on the output above, it is known that the correlation coefficient value is 0.386 with a Sig value. 0.271. Because the sig value. 0.271 > probability 0.05. So it can be said that there is no relationship between the pre-test variables and the post-test variables.

Table 7 Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				

					Lower	Upper			
Pair 1	Pre - Post	-6.500	6.042	1.910	-10.822	-2.178	-3.402	9	.008

In the output above, it is known that the resulting sig value is 0.008 < 0.05. This means that it can be concluded that there is an average difference between the pre test and post test or before being given weight lifting training and after being given weight lifting training. The "Mean Paired Differences" value is -6,500, this value shows the difference between the pre-test and post-test, 26.70 and 33.20. The difference is between -10,822 to -2,178. The calculated t value is negative (-3.402). This is because the average value of the pre-test results is lower than the average value of the post-test. In the context of a case like this, a negative t value can have a positive meaning. So the calculated t value becomes 3.402. Next, compare the calculated t and t table values. Where the t table shows DF9 with a value of 0.05/2 which is equal to 0.025. So the t table in this research is

DF9 = 2.262.

Because the calculated t value (3.402) > t table (2.262) then once again this proves that there is an average difference between the pre test (before being given weight lifting training) and the post test (after being given weight lifting training) or in other words there is The "Effect" of weight training on Topspin hitting accuracy.

CONCLUSION

With a calculated t value of more than t table in the paired sample t test in weight training on the accuracy of TopSpin shots in table tennis athletes. Thus, it can be concluded that there is an effect of weight training as evidenced by the calculated t value (3.402) > t table (2.262) which means the final result of the hypothesis is the Alternative Hypothesis.

REFERENCE

Adi, S. & Mu'arifin. 1994. *Sosiologi Olahraga*. Upt Perpus UM, Malang.

Arikunto, S. 2002. *Prosedur Penelitian Suatu Pendekatan Edisi Revisi V*. Jakarta: Rineka Cipta.

Arikunto, S. 2006. *Prosedur Penelitian Suatu Pendekatan Praktek*. Jakarta : PT. Rineka Cipta.

Arikunto, S. 2010. *Prosedur Penelitian: Suatu Pendekatan Praktek.* Jakarta: Rineka Cipta.

Arikunto, S. 2013. *Prosedur Penelitian.* PT. Rineka Cipta. Jakarta

Damiri, A. & Kusmaedi, N. 1992. *Olahraga Pilihan Tenis Meja*. Jakarta: Departemen Pendidikan dan Kebudayaan Direktorat Jendral Pendidikan tinggi Proyek Pembinaan Tenaga Kependidikan.

Gunarsa,S.D. 2004. *Psikologi Olahraga Prestasi.* Jakarta: BPK Gunung Mulia.

Hadi, S. 2000. *Statistik*. Yogyakarta: Andi Offset.

Hariono, A. 2006. *Metode Melatih Fisik Pencak Silat*. Yogyakarta: Fakultas Ilmu Keolahragaan Universitas Negeri Yogyakarta.

Hartono. 2004. *Statistika untuk Penelitian*. Yogyakarta: Pustaka Pelajar

Hermawan, dkk 2007. *Metode Pendidikan sekolah Dasar*. Bandung: UPI PRESS

Hodges, L. 1996. *Table tennis: steps to success (Tenis Meja: tingkat pemula).* Penerjemah Eri D. Nasution. Jakarta: PT Raja Grafindo Persada.

Hodges, L. 2007. *Tenis Meja Tingkat Pemula*. Jakarta: PT Raja Grafindo Persada.

Kertamanah, A. 2003. *Teknik dan Taktik Dasar Permainan Tenis Meja*. Jakarta: PT Raja Grafindo Persada.

Muhtar, T. & Sulistyo, W. 2005. *Tenis Meja (Modul Mata Kuliah Pilihan 1)*. Jakarta: Universitas Terbuka.

Nurcahyo, F. & Hermawan, H.A. 2016. *Pengelolaan Kegiatan Ekstrakurikuler Olahraga Di SD/MI/Sederajat Di Wilayah Kerja Kabupaten* Kulonprogo Yogyakarta Tahun 2015". *Jurnal Pendidikan Jasmani Indonesia, Vol 12, No. 2* (https://journal.uny.ac.id/index.php/jpji/article/view File/17107/1000 6)

Nursalam. 2013. *Metodologi Penelitian Ilmu Keperawatan. Edisi* 3. Salemba Medika. Jakarta.

Rothig, P. & Grossing, S. 1985. *Training Slehre. Bad Homburg*: Limpert Verlag GmbH.

Salim, A. 2008. *Buku Pintar Tenis Meja*. Bandung: Nuansa.

Santosa, B.P. dan Ashari. 2005. *Analisis Statistik dengan Microsoft Axcel& SPSS*. Yogyakarta: Andi Offset

Santoso, N. & Pambudi, A.F. 2016. *Survei Manajemen Program Ektrakurikuler Olahraga Di SMA Sebagai Faktor Pendukung Olahraga Prestasi Di Kabupatan Klaten*. Jurnal Pendidikan Jasmani Indonesia,Vol12,No.2.(https://journal.uny.ac.id/index.php/jpji/article/viewFile/17106/10005)

Sudrajat, A. 2009. *Permendiknas No 22 Tahun 2006.* (http://akhmadsudrajat.files.wordpress.com/2009/04/permendiknas- no - 22 tahun-2006.pdf) yang diakses pada hari kamis 11 januari 2018

Sugiyono. 2009. *Statistika untuk Penelitian, dan Sampling Purposive. Bandung:* CV Alfabeta.

Suharno, H.P. 1980. *Metodik Melatih Permainan Bola Volly*. Yogyakarta. IKIP Yogyakarta

Sukadiyanto. 2002. *Pengantar Teori Metodologi Melatih Fisik*. Yogyakarta. Fakultas Ilmu keolahragaan. Universitas Negeri Yogyakarta

Sukadiyanto. 2010. *Pengantar Teori dan Metodologi Melatih Fisik*. Yogyakarta: FIK UNY.

Susilo, A. 2010. *Pengembangan Diri dan Ekstrakurikuler.* (http://adhisusilokons.wordpress.com/2010/05/19/pengembangan diri dan ekstrakurikuler)

Sutarmin. 2007. *Terampil Berolahraga Tenis Meja*. Surakarta: Era Intermedia. Tomoliyus. 2012. Sukses melatih keterampilan Dasar Permainan Tenis meja dan Penilaian. Disajikan dalam Rangka Pembinaan Klub Olahraga Sekolah Dasar Se- Indonesia Tahap II Di Yogyakarta.

Usman, M.U. & Setiawati, L. 1993. *Upaya Optimalisasi Kegiatan Belajar Mengajar. Bandung*: PT. Remaja Rosda Karya.

Utama, A.M.B. 2005. "*Kemampuan Bermain Tenis Meja, Studi Korelasi Antar Kelincahan dan Kemampuan Pukulan dengan Kemampuan Bermain Tenis Meja*". Laporan Penelitian. Yogyakarta: FIK UNY.

Wahab, A.A. 2007. *Metode dan Model-Model Mengajar*. Bandung: Alfabeta.

Utama, A.M.B. 2005. *Kemampuan Bermain Tenis Meja, Studi Korelasi Antar Kelincahan dan Kemampuan Pukulan dengan Kemampuan Bermain Tenis Meja*. Laporan Penelitian. Yogyakarta: FIK UNY.

Wahab, A.A. 2007. *Metode dan Model-Model Mengajar*. Bandung: Alfabeta