Improvement of Forehand Smash Shots in Table Tennis Through Drill Smash Training of PJKR STKIP Darussalam Cilacap Students

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Abstract: The purpose of this research is to find out the increase in forehand smash strokes in table tennis games through drill smash drills. The method in this research uses experimental research methods. The population in the study were all male students of PJKR STKIP Darussalam Cilacap. Meanwhile, the sample consisted of 20 students. The number of samples was divided into 2 groups, namely 10 students in the experimental group and 10 students in the control group which was carried out using the Ordinal Pairing technique. The instrument used in this study was the table tennis smash forehand test. The research data were analyzed using the Variance Analysis Test technique with a significant level of 0.05. The results of this study indicate that there is an effect of drill smash training on Smash Forehand Shots where Fcount = 12,532 > Ftable 0.05 (1:18) = 4.41.

Keyword: Drill smashes, punches forehand smashes, tennis table

1. Introduction

Table tennis is one of the sports games that is starting to be in great demand by Indonesian people, it has even become a popular sport in the world, this is because table tennis is not too complicated to follow. In addition, table tennis is a sport that can be played by everyone regardless of age, as stated by (NORBOYEV, 2023) "table tennis is a sport that knows no age limit, children and adults can play together ".

The game of table tennis requires a good hit on the target because the accuracy of the hit is one of the most important factors in order to put a difficult ball in a direction that is difficult for your opponent to hit during a match. Therefore, students need to get training in mastering the exercise techniques given by the teacher or coach. The accuracy of the forehand smash can be trained with various training methods according to the desire to be achieved. The training method generally aims to improve playing skills and to improve hitting ability. One of them is the drill smash training method which can train the accuracy of hitting so that it is maximized. In table tennis, the accuracy of the forehand smash is very influential on whether it is good or bad in the game, so with the training method, the accuracy of the forehand smash and the durability of the forehand smash will be maximized when playing the ball with a longer duration.

Lack of attention and guidance from the teacher/coach will result in wrong movement patterns and not properly mastered punching techniques. It is often found that lecturers/trainers just let it go. During lectures/extracurricular activities, these students usually immediately play table tennis. Students are left to play by themselves without paying attention to the correct techniques for playing table tennis. While the lecturers/trainers sit relaxed watching them or even not being watched. This kind of situation will result in lecture/extracurricular objectives not being achieved. To achieve maximum goals, a lecturer/trainer must be creative in presenting material in various ways so that the practical material presented can be well received by students.

The reality on the ground so far is that the lecturers/trainers only come and present the children and then just leave. In addition, the lecturer/coach only watches without giving directions on how to hit the ball (smash forehand) correctly. However, judging from the technical factors that have not been sufficient, the quality in playing is far from what was expected. In the PJKR Study Program at STKIP Darussalam Cilacap, especially in the table tennis subject, the basic technique of the smash forehand has not mastered the basic techniques well. This kind of situation often gets less attention from lecturers. With this research it is hoped that it will improve the accuracy of the smash forehand stroke in students in playing table tennis, so that it will support table tennis playing skills.

According to the observations of researchers in table tennis lectures, so far lecturers have not implemented proper training methods to improve the ability to hit forehand smashes, lecturers only emphasize students to be able to do smash forehand without paying attention to correct or wrong technique. On this basis, the authors want to conduct research on "Improvement of Forehand Smash Shots in Table Tennis Through Drill Smash Training of PJKR STKIP Darussalam Cilacap Students".

According to (Alsaudi, 2020) smash is a backhand or forehand that is very hard and has a function to kill the opponent. Furthermore, according to (Zhu et al., 2023) a smash is also called a ball killer punch or ball slayer with the greatest attack power and consumes a lot of stamina. A smash is a developmental stroke from a hit and the type of ball spin includes a plain ball. So the forehand smash produces the most powerful attack ball, which is always accompanied by a step forward while stomping the soles of the feet to the floor, this blow often determines a victory or defeat in a match. Forehand smash, if it can be driven away by the opponent then the follow-up punch will be even sharper than the first attack. The forehand smash contains a killer air which is very deadly because in the process it uses the strength of all the limbs and the movement is bigger and faster than a hit (Zhu et al., 2023).

In table tennis, smashes are not always used to return the ball from the opponent's blow. Smash can only be done if there is a possible opportunity to hit a smash whose aim is to kill the opponent's game, so as to get points. Besides there is a possible opportunity. After being able to do a basic shot well, then a smash is done, and even then you have to use feeling and see a good position so you can hit the ball properly (Akramjonovich et al., 2022). The forehand smash technique is performed with the position of the two legs slightly larger, the body rotates to the right from the hips. The movement of hitting the arm moves from back to front, from right to left and from top to bottom. The downward

direction of movement depends on the height of the smashed ball (McAfee, 2009). The higher the position of the ball when hit, the lower the direction of arm movement and body rotation. The final attitude of the forehand smash movement is that the angle between the upper arm which is directed forward and the body becomes smaller, as well as the angle between the forearm and the upper arm. In discussing the movement of the arm that the movement is downward if the ball is hit at a higher point, but the height of the ball that can still be smashed will be affected by the restriction, namely the upper arm may not be parallel to the shoulder, let alone be higher. But on a higher ball there will be two possibilities, namely hitting the ball before it reaches its highest point or hitting the ball after it reaches its highest point (Qian et al., 2016).

To do a forehand smash, the position of the left foot slightly in front of the body is twisted/rotated to the right from the hip. The position of the arms, especially the upper arms, is determined by the height at which the ball will be hit. The higher the ball, the upper arm must adjust to its height, if the ball is only slightly higher than the net, the upper arm does not need to be lifted so high. It is best if the upper arms are not too close to the body and the forearms form an angle of more than 90 degrees to the upper arms.

Training is the process of carrying out sports activities carried out based on a training program that is arranged systematically, aiming to improve the ability of athletes in an effort to achieve maximum performance, especially carried out in preparation for a competition. Efforts to improve movement skills are carried out in the form of a training process (Van Merriënboer & Kirschner, 2017). To prepare training conditions in learning movement skills, it is necessary to consider the method. The accuracy in determining the method used can affect the level of achievement of the training objectives (Levac et al., 2019). The use of the right method will be useful for dealing with unfavorable situations and conditions of students and the environment.

The principles of training that must be considered in training according to (Bompa & Buzzichelli, 2021) include: (1) the principle of being active and serious in practicing, (2) the principle of overall development, (3) the principle of specialization, (4) the principle of individual , (5) the principle of varied training, (6) the principle of modeling is a training process, (7) the principle of increasing the load. Training programs carried out by athletes together with coaches must have clear goals. In general, the objectives of training according to Harre (1982:8) are: a) Develop personality. b) Conditioning, with the main objective to increase power, speed and endurance. c) Improving technique and coordination of motion. D) Improving tactics. e) Improve mentally.

According to (Numonjonov, 2020) the definition of a training method is a simulation training, a form of isomorphic training, which is similar or almost resembles a game or technical characteristics of a game or an actual match, which is arranged based on the specific elements of the phenomenon being sought. One variation of the training pattern for improving and developing the physical condition and skills of table tennis is the drills training pattern.

The use of this drills training model is adjusted to the goals to be achieved. For the development of technical skills in table tennis, many variations of the exercise have been developed. The drills training method is a variation of exercises carried out by individuals

and groups for the development of techniques in accordance with the objectives achieved. The importance of the drills training method was also stated by (Ninglan et al., 2019) who stated that each exercise must contain drills that are useful and have a clear direction and purpose. In its application, this method can be carried out with coaches, playmates, sparring partners who are prepared and with the environment, for example with walls or using targets.

The effect of the drills training model according to (Barnett et al., 2016) states that the types of drills can improve movement skills. The drills training model is a varied training pattern specifically for techniques carried out in a patterned, systematic and continuous manner for skill development. This method is a specific variation of exercises in the game according to the specification principle. In the training method for technical development, in general, trainers are still oriented towards the principles of physical training, namely the principle of specification training, for example to improve smash strokes in table tennis games, various specification exercises are given according to the goals to be developed, including drill smash drills. The form of drill smash training referred to in this exercise is as follows:
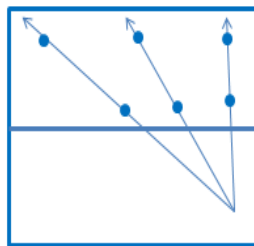
Figure 1. Target of Drill Smash Training

The targets that can be hit are areas that are straight with the bat, the area to the right of the opponent, and the area between the two (see the picture above). What is important to note in target smash practice is the variation of the target itself, meaning that the results of the smash aim at certain areas varied, resulting in a collection of long-short, left-right, long left-short left, long right-short right and long punches (Suwo et al., 2021). This exercise emphasizes the level of accuracy/precision in directing the ball to certain targets, so that all the strokes taken are not just returning the opponent's blow but are planned shots towards the target. It is also important to emphasize the level of consistency of the direction and target of the shot in practice, meaning that the practice strives for consistent hitting results according to what was planned when hitting. The ability to deploy this ball if mastered properly will provide advantages during the match, namely the ability to direct the ball at the opponent's weak point in a place that is difficult to reach, even a ball that is directed at certain places can be a fishing effort to attack the opponent.

2. Methods

This research is classified as field experimental research, with the research design being the Randomizet Pre-Test Post Test Control Group Design. The population in this study were all PJKR STKIP Darussalam Cilacap students. While the sample in this study

amounted to 20 students drawn by total sampling technique. After the pre-test was carried out, the group was divided into 10 samples each for the experimental group (K1) and 10 samples for the control group (K2), which was carried out using the ordinal pairing technique.

3. Results

After carrying out the pre-test and post-test of the two groups, namely the experimental group and the control group, the average and standard deviation of the two groups were obtained. The average in question can be seen in the table below.

Table 1. Descriptive Statistics

Statistics	experiment		control	
	Initial test	Final test	Initial test	Final test
Mean	69.56	71.12	68.97	69.01
SD	10.21	11.53	10.46	10.92

The average forehand smash results of PJKR STKIP Darussalam Cilacap students before being given drill smash practice in the experimental group was 69.56 and a standard deviation of 10.21 and after being given drill smash practice for 8 weeks the average forehand smash results for PJKR STKIP students Darussalam Cilacap is 71.12 with a standard deviation of 11.53.

The average forehand smash result of the control group of PJKR STKIP Darussalam Cilacap students who were not given drill smash practice in the initial test was 68.97 and the standard deviation was 10.46 and in the final test the results of the forehand smash of PJKR STKIP Darussalam Cilacap students with an average of - the mean is 69.01 and the standard deviation is 10.92.

Table 2. Data normality

Variable	N	Sig.	Information
Experimental group initial test	10	0,674	Normal
Experimental group final test	10	0,565	Normal
Control group initial test	10	0,790	Normal
Control group final test	10	0,679	Normal

Based on table 2 above about the results of the normality test on the initial test and post test of the two groups, it can be stated as follows: Initial test data for the smash forehand student PJKR STKIP Darussalam Cilacap, the experimental group obtained a significant value of 0.674 with n = 10 greater than α 0.05. This shows that the initial test data for the smash forehand of PJKR STKIP Darussalam Cilacap students is normally distributed. Then the data for the final smash forehand test for PJKR STKIP Darussalam Cilacap students, the experimental group obtained a significant value of 0.565 with n = 10 greater than α 0.05. This shows that the final test data for the smash forehand of PJKR STKIP Darussalam Cilacap students is normally distributed.

The data for the initial smash forehand test for PJKR STKIP Darussalam Cilacap students, the control group obtained a significant value of 0.790 with n = 10 greater than α 0.05. This shows that the initial test data for the smash forehand of PJKR STKIP Darussalam Cilacap students is normally distributed. Then the data for the final smash forehand test for PJKR STKIP Darussalam Cilacap students, the control group obtained a significant value of 0.679 with n = 10 greater than α 0.05. This shows that the final test data for the smash forehand of PJKR STKIP Darussalam Cilacap students is normally distributed.

Table 3. Data Homogeneity

Levene statistics	df1	df2	Sig.	Information
0.324	1	18	0.542	Homogeneous

Based on Table 3, the results of the homogeneity test for forehand smash data for PJKR STKIP Darussalam Cilacap students with the Levene Test was 0.324 with a significant value of 0.542. Because the significant value is greater than α 0.05, the data for the forehand smash for PJKR STKIP Darussalam Cilacap students for the two groups is homogeneous or comes from relatively the same group. The following are the results of the Test – t test.

Table 4. T-test results between sample groups

Variabel	Average	t observation	Sig.
initial – final experimental group	0,709	12,343	0,021
initial – final control group	0,578	8,426	0,014
final test experimental -control	0,659	13,489	0,006

Based on Table 4, the summary of the results of the data analysis of the smash forehand punch of PJKR STKIP Darussalam Cilacap students with the final paired t-test in the experimental group and the control group obtained t count = 12.343 (α 0.05 > sig = 0.021). Thus, there is a significant effect of drill smash training on the forehand smash of PJKR STKIP Darussalam Cilacap students. The average difference between the experimental group and the control group was 0.569. In conclusion, the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted.

4. Discussion

In table tennis, smashes are not always used to return the ball from the opponent's blow. Smash can only be done if there is a possible opportunity to hit a smash whose aim is to kill the opponent's game, so as to get points. Besides there is a possible opportunity. After being able to do a basic shot well, then a smash is done, and even then you have to use feeling and see a good position so you can hit the ball properly.

For the development of technical skills in table tennis, many variations of the exercise have been developed. The drills training method is a variation of exercises carried out by individuals and groups for the development of techniques in accordance with the

objectives achieved. The importance of the drills training method was also stated by (Ninglan et al., 2019) who stated that each exercise must contain drills that are useful and have a clear direction and purpose. In its application, this method can be carried out with coaches, playmates, sparring partners who are prepared and with the environment, for example with walls or using targets.

The drills training model is a varied training pattern specifically for techniques carried out in a patterned, systematic and continuous manner for skill development. This method is a specific variation of exercises in the game according to the specification principle. In the training method for technical development, in general, trainers are still oriented towards the principles of physical training, namely the principle of specification training, for example to improve smash strokes in table tennis games, various specification exercises are given according to the goals to be developed, including drill smash drills.

This exercise emphasizes the level of accuracy/precision in directing the ball to certain targets, so that all the strokes taken are not just returning the opponent's blow but are planned shots towards the target. It is also important to emphasize the level of consistency of the direction and target of the shot in practice, meaning that the practice strives for consistent hitting results according to what was planned when hitting. The ability to deploy this ball if mastered properly will provide advantages during the match, namely the ability to direct the ball at the opponent's weak point in a place that is difficult to reach, even a ball that is directed at certain places can be a fishing effort to attack the opponent.

5. Conclusion

Based on the research, the result of the experimental group's forehand smash before being given drill smash practice in the experimental group was 69.56 and the standard deviation was 10.21 and after being given drill smash the result of the forehand smash was 71.12 with a standard deviation of 11.53. Then the result of the control group's forehand smash which was not given drill smash in the initial test was 68.97 and the standard deviation was 10.46 and in the final test the result of the forehand smash was 69.01 and the standard deviation was 10.92. So it can be concluded that drill smash practice has an effect on increasing forehand smash strokes in table tennis games for PJKR STKIP Darussalam Cilacap students.

As for what was conveyed in this research study, among others, for students taking table tennis courses who have less ability in basic smash techniques to always try to improve their practice, so that the ability to do smashes can succeed in achieving maximum performance. For teachers or trainers, always pay attention to the ability of students to teach and practice smash forehand strokes by providing learning of various effective training methods, including the drill method and other methods. For other researchers, they should conduct research with different study methods or in combination so as to improve the results of the smash forehand in table tennis games can be identified more broadly.

References

Akramjonovich, Y. I., Abdumalikovich, U. A., Urinboyevna, U. Z., Abduxamidovich, M. I., Azamovich, A. M., & Umidovich, A. B. (2022). Main Characteristics Of Table Tennis In International Sport And Technologies Of Playing It. *Journal of Positive School Psychology*, *6*(10), 2183–2189.

Alsaudi, A. T. B. D. (2020). The influence of drill exercise and eye coordination foot methods toward the smash skill of badminton. *1st South Borneo International Conference on Sport Science and Education (SBICSSE 2019)*, 76–82.

Barnett, L. M., Stodden, D., Cohen, K. E., Smith, J. J., Lubans, D. R., Lenoir, M., Iivonen, S., Miller, A. D., Laukkanen, A., & Dudley, D. (2016). Fundamental movement skills: An important focus. *Journal of Teaching in Physical Education*, *35*(3), 219–225.

Bompa, T., & Buzzichelli, C. (2021). *Periodization of strength training for sports*. Human Kinetics Publishers.

Levac, D. E., Huber, M. E., & Sternad, D. (2019). Learning and transfer of complex motor skills in virtual reality: a perspective review. *Journal of Neuroengineering and Rehabilitation*, *16*, 1–15.

McAfee, R. (2009). *Table tennis: Steps to success*. Human Kinetics.

Ninglan, T., Soegiyanto, S., & Sulaiman, S. (2019). Effect of Arm Muscles and Long Arm Power Exercises on the Results of Accuracy in Forehand Smash Blows in Table Tennis Games at Silaberanti Club, Palembang. *Journal of Physical Education and Sports*, *8*(4), 88–94.

NORBOYEV, A. (2023). TABLE TENNIS BENEFITS THE HUMAN BODY, CHILDREN'S HEALTH AND STRENGTHENING THE IMMUNE SYSTEM. *Theoretical Aspects in the Formation of Pedagogical Sciences*, *2*(5), 150–154.

Numonjonov, S. D. u. (2020). Innovative methods of professional training. *ISJ Theoretical & Applied Science*, *1*(81), 747–750.

Qian, J., Zhang, Y., Baker, J. S., & Gu, Y. (2016). Effects of performance level on lower limb kinematics during table tennis forehand loop. *Acta of Bioengineering and Biomechanics*, *18*(3), 149–155.

Suwo, R., Haris, I. N., Rosti, R., Sabrin, L. M., Jumaking, J., & Yasin, R. A. (2021). Pengaruh Pendekatan Pembelajaran Drill dan Bermain Terhadap Hasil Belajar Forehand Drive Permainan Tenis Meja Pada Mahasiswa Penjas USN Kolaka. *Musamus Journal of Physical Education and Sport (MJPES)*, *3*(02), 60–67.

Van Merriënboer, J. J. G., & Kirschner, P. A. (2017). *Ten steps to complex learning: A systematic approach to four-component instructional design*. Routledge.

Zhu, R., Yang, X., Chong, L. C., Shao, S., István, B., & Gu, Y. (2023). Biomechanics of Topspin Forehand Loop in Table Tennis: An Application of OpenSim Musculoskeletal Modelling. *Healthcare*, *11*(9), 1216.