

# Contribution of SAQ Exercises and Pliometric Exercises Against Smash in Princess Volleyball Games

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**Abstract**—This research aims to determine the contribution of push-up training and Box Jump training to the accuracy of the results of the Putri Club Volleyball smash Disapora Binjai. The sampling technique used is Purposive Sampling. The number of female athletes as many as 8 people. This research was conducted for 6 weeks with a frequency of exercise 3 times each week. The results of the research analysis concluded that; (1) there is a significant contribution between push-up training on the results of the Putri Club Volleyball Baplap Smash ball Smash results, this is evidenced from the calculation results of  $F_{count} 10.92 > f_{t. 5.21}$ . (2) there was a significant contribution from Box jump training to the results of the Women's Club Volleyball Smash Ball Disapora Binjai . This is evidenced from the results of the analysis of the hypothesis obtained  $f_{count} 10.41 > f_{t. 5.21}$ . (3) there was a significant contribution between push-up and box jump training on the results of the Ladies Club Disapora Binjai Club Volleyball smash, this was proven by a  $6.64 > f_{t. 5.21}$  score. The conclusion resulting from the results of this study is that overall there is a significant contribution jointly between push-up training and box jumping to the results of the women's volleyball smash club Disapora Binjai.

**Keywords:** *muscle explosive power, arms, smash*

## I. INTRODUCTION

Each branch has characteristics according to the type of skills contained in the game in question. Likewise, volleyball plays have a variety of techniques. These various techniques are used to achieve optimal presentation, optimal performance is impossible to achieve well without having good basic techniques. The technique possessed by someone in the volleyball game is crucial, especially in the effort of cooperation between players to achieve victory, because volleyball is a team game that requires cooperation and adaptation between fellow players. It can be concluded that smash is a basic technique in volleyball game which is the highest score contributor if it can be done properly and correctly. Besides the technique of hitting the ball like a smash can ignite the spirit of the team in the match because of its explosive movements. Smash is a volleyball technique that is

always used to attack and make as many points as possible and win. Volleyball is a fast-paced game where attacking techniques are more dominant than defense. The act of hitting the ball by jumping as high as high and hitting the ball hard from the top down, the net nets sharp and deadly so the opponent cannot anticipate the attack and earn points [1].

In principle, the exercise is the application of a plan to improve the ability to exercise which contains material theory and practice, methods, and rules of implementation in accordance with the goals and objectives to be achieved. The exercise was obtained by combining three factors consisting of intensity, frequency, and duration of the exercise. Although these three factors have their own qualities, all must be considered in adjusting the conditions during training. Exercise is a systematic process or work repeatedly in the long term, which is increased gradually and individually, aimed at the formation of physiological functions to fulfill task completion [2].

In volleyball games where in an athlete's movement really requires a SAQ and Plyometric training, which in the exercise really gives a big factor to the techniques that are specific to the Smash technique.

SAQ stands for Speed, Agility and Quickness or one form of exercise that can develop speed, agility and reaction simultaneously [3]. Speed is defined as the ability of biomotivists to move from one point to another on a straight line quickly. Agility means an ability to move from place to change direction quickly. Quicness is the quality of moving quickly or generating movement quickly which is limited by time. Quicness is characterized by the response given by the body to stimuli from outside the body.

Volleyball games are synonymous with fast-paced movements, agility and a response that will later become a good movement against smashes on athletes. Speed, agility and fast training can increase the speed, agility and acceleration of an athlete [4]. Speed, agility and acceleration (SAQ) training can eliminate the mentality that is most likely for the player to put out his best strength so that the form of his movements can be controlled in a balanced manner [5].

SAQ training is an exercise that can develop various aspects of motion such as speed, balance, agility, quickness of power, coordination, balance of perception [6].

Plyometric training is an appropriate exercise for people who are conditioned and are devoted to being athletes in improving and developing maximum jumps, speed, and strength, especially in volleyball games. [7] A method of training that emphasizes high-speed movements, plyometric training to apply speed to strength. [8] in another study explained to know the effectiveness of weight training and plyometric exercises in increasing leg muscle strength and reaction speed.

Furthermore, in the appearance of athletes, both in training and competition always aims to develop patterns of movement, especially the skills of the sports that are trained. Although many sports activities require a great amount of flexibility, speed, balance, coordination, these factors are combined with strength factors in order to obtain good results so strength is the basis of the physical condition component. [9] In an effort to make the exercise effective and useful, the exercise itself must be based on the principles of training, such as the principle of overload, the principle of specificity or specifications, the principle of individualization, the principle of using weights gradually, the principle of reversibility, the principle of regular training and the principle of recovery.

In carrying out the experiment the training load will later be increased from week to week, namely on reps and sets to be done. [6] For Push-up exercises and Jump box the number of reps uses an initial load of 60% of the maximum ability of people trying, then from week to week the burden will be added up to 80% of the maximum ability.

The principle of reversibility (duration of exercise) in this study for 6 (six) weeks with a frequency of 3 (three) times a week. [10] Exercises carried out for 2-6 weeks will have an effect, so that the research subjects have the opportunity to develop and adapt so they can carry out the next exercise, including each set given a break for 2-3 minutes.

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The training that must be performed by an athlete must be in line with the needs and characteristics of the movement in the sport and especially to make a smash in volleyball. As for exercises by moving quickly on objects that move and are needed in volleyball games so that the SAQ training and Pliometric exercises are expected to contribute to improving the ability of athletes to make Smash to the fullest.

## II. METHOD

Based on the characteristics also the characteristics carried out in this study using purposive sampling techniques, while the final results are used as samples in this research with the following conditions: Willing to be a sample, Age 16-17

years, Active training, smasher. Furthermore, this research uses an experimental method with data collection techniques using tests and measurements as what was stated earlier and which this study aims to determine the contribution of SAQ training and Pliometric training on the ability to smash in volleyball games at the girls' club in Disapora Binjai. The study design is as follows:

TABLE I. TES ONE GROUP DESIGN

<i>Pre test</i>	Treatment	<i>Post-test One Design</i>
T <sub>1</sub>	L P U L J B	T <sub>2</sub>

Where :

- T<sub>1</sub> : *pre test*
- L P U : *practice push-up*
- L J B : *practice box jump*
- T<sub>2</sub> : *post test*

When given this research was given for 6 weeks with a frequency of 3 times a week. After being given approval, a final test (post test) is held to see the agreement on the form of the exercise.

## III. RESULTS AND DISCUSSION

Data obtained from test and measurement results were analyzed and used as a basis for providing training. Based on the pre-test results of Push-Up training on the results of the Smash volleyball women's club volleyball club performance in 2016, obtained data reject Medicine Ball with a range of scores between 245– 387, an average value of 3.25 Standard deviations of 0.44. Above an average value of 5 people (45.4%), while below an average of 3 people (54.5%). While the results of the Box Jump training pre-test on the results of the Smash volleyball club women's abilities in the Binjai club in 2016, obtained data with a score range of 48.34 - 35.24, an average value of 42.02 and a standard deviation of 4, 24 Above an average value of 4 people (50.0%), while below an average value of 4 people (50.0%). Meanwhile, as for the results of the pre-test of the smash ability training on the women's club volleyball Disapora Binjai in 2016, data obtained with a range of scores of 5.71 - 7.73, an average value of 7.08 and a standard deviation of 0.62. an average score of 5 people (63.6%), while below the average is below an average of 3 people (36.4%).

From the results of the pre-test that has been done on atle, then the athlete performs a post-test. Based on the results of the Push-Up exercise post-test on the results of the volleyball smash game ability for girls in club Disapora Binjai in, obtained an increase in data starting from rejecting Medicine Ball with a range of scores between 303-443, an average value of 3.68, Standards deviation of 0.381. Above an average value of 6 people (54.5%) while below an average of 2 people (45.4%). Furthermore, the results of the Box Jump post test exercise which has a range of scores of 49.28 - 60.21 the average value of 3.68 and the standard deviation of 0.381. Above an average value of 5 people (45.4%), whereas below

an average of 6 people (54.5%). And finally Smash ability post-test results have a range of values of 4 - 7, an average value of 4.818, a standard deviation of 0.981. for the timeframe obtained is 35.79 - 73.08, the average value is 5.42 and the standard deviation is 0.65. the average value is 3,249, the standard deviation is 0.436. Above the average value of 5 people (64.5%). while below an average of 3 people (35.5%).

**TABLE II. DATA NORMALITY TEST**

Variable	Average & Standard Deviation	$L_0$	$L_{Label}$		Means
Data Post-Test Medicine Ball	X = 50,0009 s = 9,998	0,011	0,285	5%	Normal
Data Post-Test Box Jump	X = 50,00091 s = 9,999	0,08	0,285	5%	Normal
Data Post-Test K Smash	X = 99,99 s = 19,28	0,164	0,285	5%	Normal

Normality test for data analyzed using the Lilifors test, the data is said to be normally distributed if the L hitung is smaller than the L table [11]. Based on the analysis conducted that the post-test test on Medicine Ball has a  $L_{hitung}$  of 0.011 < 0.234. So it can be concluded that the sample comes from populations that are normally distributed. Whereas in the Box Jump post-test normality test and the post-test normality test the smash ability obtained Lilifors test results of 0.08 and 0, 164 which indicates  $L_{hitung} < L_{table}$ . So based on these results it can be said that the sample comes from a population that stands. Based on the results of the analysis of the hypothesis test showed positive results, where there is a significant contribution between Push-Up and Box Jump exercises on the results of Smash ability in the women's volleyball club Binjai field 2016. Results this shows that overall Push Up and Box Jump exercises have a positive contribution to the results of the women's volleyball Smash ability at Binjai. normal distribution. [12] It was further explained that the purpose of this study was to evaluate the effects of speed, agility, speed (SAQ) training methods on power performance in athletes.

In volleyball training to be able to improve the results of the Smash ability, it requires Push Up training and Box Jump training. As with exercise is one form of physical exercise that can increase arm and shoulder muscle power. Push Up exercises have movements that can affect the results of the ability to smash in volleyball games, because Push-Up exercises have movements that can increase physical power which is one of the most important parts for all exercises in sports both in volleyball and other branches. If someone always practices Push Up then that person has power in each arm muscle that has an influence on the ability to smash in volleyball games. This shows that there is a contribution to the Push-Up training with the volleyball smash ability through a regression test there is a contribution of 10.92 These results indicate that, push-up training has a contribution to the results of someone's smash ability in volleyball games.

While Box Jump training in volleyball game Smash ability training is the development of motion patterns that aim to skil the motion such as agility, flexibility, speed, balance, and

coordination with factors combined by strength in order to obtain good results. Similar to previous studies where SAQ training aims to determine the effect of short burst speed training and change of direction training on sprint athletes [13].

Muscle strength in this case is leg muscles. The position of the jump box stands half squatting and then jumps up in the same position. This is necessary leg muscle strength that aims to increase leg muscle strength. In addition to Push Up exercises, Box Jump Exercises in improving Smash ability results are also very necessary. Box Jump Training with a half squatting position and then jumping up in the same position can clearly increase the leg muscle strength of the legs so this exercise is one of the most important activities to improve the volleyball smash ability. This shows that there is a contribution to Box Jump training with the volleyball smash ability through the regression test there is a contribution of 10.41. These results indicate that, Box Jump training has a contribution to the results of one's smash ability in volleyball games.

Based on the overall results of the test using the regression test showed there was Freg obtained by 6.64 or this shows that the Push-Up and Box Jump exercises have a contribution that can predict the results of the smash ability.

#### IV. CONCLUSION

Based on the results of the analysis conducted, it can be concluded that there is a significant contribution between Push-Up training on the results of Smash ability in women's club volleyball Disapora Binjai field, furthermore a positive contribution between Box Jump training on Smash ability results in volleyball games putri club Disapora Binjai. In addition there is also a significant contribution between Push-Up and Box Jump training on the results of the ability to Smash in the volleyball ball princess club Disapora Binjai.

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