OPEN ACCESS

International Journal of Pedagogical, Humanities and Social Studies | Vol. 1 No. 1 (2025)

Research Article

Contribution of Split Squat Jump and Clap Push-Up Exercises to the Improvement of Back Handspring Ability in Persani Medan Junior Male Athletes in 2024

Joy Parulian Sitanggang[1*], David Siahaan[2], Andarias Ginting[3], Jan Bobby Nesra Barus[4]
[1-4]Faculty of Sports Science, Universitas Negeri Medan, Indonesia
Email: [1)] joysitanggang2020@gmail.com, [2)] davidsiahaan@unimed.ac.id

Received:	Revised:	Accepted:	Online:
January 08, 2025	February 28, 2025	March 10, 2025	March 13, 2025

Abstract
The purpose of this study was to determine; (1) the contribution of split squat jump training to the improvement of back handspring ability in PERSANI Medan junior male athletes; (2) the contribution of clap push-up training to the improvement of back handspring ability in PERSANI Medan junior male athletes; (3) the contribution simultaneously through split squat jump and clap push-up training to the improvement of back handspring ability in PERSANI Medan junior male athletes. This research uses experimental method with one group pre-test post- test design. The population was 16 people and the sample in this study amounted to 6 junior male athletes of PERSANI Medan with sampling using purposive sampling technique. Data analysis techniques using regression analysis techniques. Based on the results of the study, it shows that; (1) There is a significant contribution of split squat jump training to the improvement of back handspring ability in PERSANI Medan junior male athletes. With post-test data determination of 74.12%. (2) There is an insignificant contribution of clap push-up exercise to the improvement of back handspring ability in junior male athletes of PERSANI Medan. With post-test data determination of 62.7%. (3) There is a simultaneous contribution through split squat jump and clap push-up exercises that is not significant to the improvement of back handspring ability in junior male athletes of PERSANI Medan. With post-test data determination of 74.12%.

Keywords: Exercise, Split Squat Jump, Clap Push-Up, Back Handspring

1. Introduction

Sport is a type of physical exercise that is planned and performed repeatedly with the aim of improving physical fitness. The activity is in the form of movements that require every part of the body to be active according to its function (Bompa, 1983). Sport is not only about maintaining a healthy body and mind, but also teaches the values of sportsmanship and the importance of teamwork. Exercise can be done anytime and anywhere (Werner et al., 2012). Doing exercise regularly can help increase muscle mass and improve one's endurance (Harsono, 2015). This is because exercise can stimulate muscle cells to grow larger and can reactivate muscle cells that were previously inactive. This is in accordance with the physical activities carried out by humans in everyday life.

One of the famous sports is gymnastics, which is often called gymnastics. To know the meaning of the word gymnastics, it is necessary to explain some things related to the meaning of gymnastics itself (Sajoto, 1995, 2021). Gymnastics is a translation of the word *gymnastiek* (Dutch) or gymnastic (English). *Gymnastiek* comes from the word *gymnous* (Greek), which means naked, or half naked. Thus, the meaning of gymnastics is an activity that is intended so that movements can be carried out without interference so that they become perfect and good (Hidayat, 1996). According to Apriadi (2012); Mahendra (2000), gymnastics has various types grouped by FIG (federation internationale de

gimnastique), namely artistic gymnastics, sportive rhythmic gymnastics, acrobatic gymnastics, sport aerobics, trampoline gymnastics, general gymnastics (La Porte & Renner, 1938). According to Margono (2009) gymnastics is defined as a form of physical activity that uses selected and planned movements to achieve certain goals. The essence of gymnastics lies in the beauty of each movement, so it is called artistic gymnastics.

Artistic gymnastics is a type of gymnastics that prioritizes flexibility and balance movements with fast and explosive movements that will make beautiful movements and surprise others (Hidayat, 1996; Hidayat & Panggabean, 1983). Artistic gymnastics is a type of gymnastics that involves movements performed with tools or tools. Men's artistic gymnastics competitions use a lot of equipment, including floor exercises, jumping horses, saddle horses, bracelets, single bars, multi-tiered bars, parallel bars, and balance beams (Mahendra, 2000; Margono, 2009; Soekarno, 1985). The number of numbers for floor exercise remains one family, and the term "floor" is used to indicate that the exercise movements are performed on the floor. The mat is the tool used to do this.

Achievement in floor gymnastics depends not only on good technique, but also on the athlete's strength, balance and reaction speed. One of the movements that is an important benchmark in floor gymnastics is the back handspring, which requires good body coordination and adequate strength (Adi, 2018). Back handspring is one of the advanced techniques in floor gymnastics which involves jumping backwards with a 360 degree turn in the air, starting from a standing position and landing back with both feet. This technique requires physical conditions such as strength, speed, balance, and good body coordination. To perform a back handspring well, you need sufficient explosive power in addition to balance, coordination, and courage (Akhmad, 2013). Therefore, creating an efficient physical training method to improve back handspring ability is very important in the development of floor gymnastics athletes.

This research stems from observations made by researchers at the Jepta Hutabarat Gymnastics Building. At that time, researchers saw junior athletes practicing basic back handspring techniques. After observing the movements made by athletes, researchers found many athletes who made mistakes in the basic movements of the back handspring. When doing a back handspring, the researcher sees a bad start, the leg kick is not high, the hands are not straight and the landing is not perfect and the bounce is not good and unbalanced. This is due to the lack of physical condition of athletes who support the basic movements of the back handspring, so that when doing the movement, the results are not perfect or not good. Thus, it can be concluded that the athlete's physique is still lacking so that he cannot master the back handspring movement properly, this will have a negative impact on athletes which can result in injury.

Through the results of the pre-test (initial data collection) conducted by researchers, many athletes' physical conditions are still below average or lacking. One physical condition that is still lacking is leg muscle power and arm muscle power. The lack of physical condition is due to rarely given physical exercise, especially an increase in leg muscle power and arm muscle power, and what is commonly done is strength training. Athletes who make mistakes, especially when the initial leg kick is not high, the attitude of the legs while in the air is bent, when bouncing the hands are not stable when supporting, so that when landing is not good and unbalanced, and strong hand repulsion when repelling, this is due to a lack of leg muscle power and arm muscle power where they focus backwards and are afraid when jumping backwards, so that the repulsion of the legs and hands is not too concerned when doing the back handspring movement and it is very important.

This is in accordance with the results of an interview with coach Muhammad Iqbal on February 23, explaining that athletes rarely get physical training that supports the basic back handspring technique in gymnastics, so athletes are lacking in improving their back handspring abilities. To

overcome this, it is necessary to increase physical exercise and techniques in floor gymnastics in training to maximize movement.

Back handspring will look more beautiful if the athlete can make a good start, namely the repulsion of both feet high and far back and a strong hand support will hold the body for a moment when bouncing. The position of the legs remains straight after jumping back and the hands push after the legs pass back and almost land. At the time of landing the body is balanced with both feet in place and hands raised upwards.

From the results of observations and interviews that have been conducted, it can be concluded that power in the legs and arms is one of the supporting factors in performing back handspring movements. To increase leg muscle power, researchers use split squat jump training. Back handspring requires great leg strength and explosiveness to perform explosive repulsion and rotation. Split squat jump can be done easily anywhere without the need for special equipment (Wahyuni et al., 2023). This exercise can also train single-leg balance and coordination between legs, which are important for maintaining balance when landing and rotating in the back handspring. To increase arm muscle power, researchers use a form of clap push-up training. Clap push-ups involve pushing up and clapping the hands in front of the chest, which is similar to the movement in the back handspring. This exercise requires good coordination and agility to perform the clapping movement in front of the chest. It trains the body to move quickly and coordinated to perform the back handspring smoothly and efficiently. This exercise can be done anywhere without the need for special equipment.

According to the background above, the researcher is interested in conducting research to solve the problems found in PERSANI Medan City junior male athletes in 2024, which directs the ability to back handspring on floor gymnastics numbers, knowing the contribution together between Split Squat Jump and Clap Push-Up Exercises to Increase Back Handspring Ability in PERSANI Medan Junior Male Athletes in 2024.

2. Literature Review

To improve the ability of a good back handspring, physical training is needed for leg muscle power and arm muscle power which will affect the results of gymnastic sports movements, and when leg muscle power and arm muscle power have increased, it will contribute to improving the ability of perfect back handspring movements. With the theory obtained from the split squat jump and clap push-up exercises, namely to increase power, the level of courage and success in performing the back handspring movement will be better.

With the contribution of split squat jump and clap push-up exercises, it will affect the improvement of back handspring ability because with training, athletes have the courage with sufficient leg muscle power and arm muscle power will be able to increase success in performing back handspring movements so that an athlete's performance will look perfect.

From that explanation, split squat jump and clap push-up exercises can increase leg muscle power and arm muscle power which makes a significant contribution to improving the ability to do back handspring in PERSANI Medan junior male athletes in 2024. Because these exercises make it easier for athletes to do back handspring movements and the success rate increases. With the split squat jump and clap push-up exercises, it can improve the ability of back handspring movements in order to improve the achievements that will be achieved by PERSANI Medan 2024 junior male athletes.

2.1. Hypothesis

Research is conducted to test hypotheses, because answers are temporary from a research problem. Based on the description above, the research hypothesis can be formulated, namely:

a) There is a contribution of split squat jump training to improving back handspring ability in PERSANI Medan junior male athletes in 2024.
b) There is a contribution of clap push-up training to the improvement of back handspring ability in junior male athletes of PERSANI Medan Year 2024.
c) There is a joint contribution between split squat jump and clap push-up exercises to improving back handspring ability in PERSANI Medan junior male athletes in 2024.

3. Methods

3.1. Population and Sample

The population in the study were all artistic gymnastics athletes PERSANI Medan City, as many as 16 people consisting of 11 (people) men, 5 (people) women. The sample in the study studied was 6 people, who were taken with a sampling technique (purposive sampling) conditional sampling. The sampling technique is based on the criteria of the researcher that the respondent will provide the information needed in accordance with the research objectives (Sudjana, 1992). The conditions for taking purposive sampling techniques are:

1) Participants must be male to meet the research criteria.
2) This research is only open to individuals aged between 8 and 17 years.
3) Participants have a minimum of 6 months of training experience. This is to ensure participants have sufficient understanding and ability for the study.
4) Good physical and mental health is essential for participants.
5) Participants are expected to actively attend scheduled training and research sessions.
6) Commitment and active participation are critical to the success of the study.
7) This study requires samples and contributes to the study for analysis.

3.2. Research Methods

The method used in the research is the experimental method and data collection techniques using tests and measurements whose purpose is to reveal a systematic, factual and accurate description of the phenomenon under study. This study has independent variables, namely: split squat jump training and clap push-up training, and the dependent variable, namely: back handspring movement, in PERSANI Medan junior male athletes in 2024.

3.3. Research Design

The research design used is to conduct initial and final tests using a one group pre-test and post-test design where this study provides an initial test before treatment, and conducts a final test after treatment. And the above statement can be concluded that the results can be obtained after comparing the initial results (pre-test) with the final results (post-test) (Sugiyono, 2013).

This design is also adjusted to the objectives to be achieved, namely knowing the improvement of the Back Handspring movement after being given treatment, namely Split Squat Jump and Clap Push-up Exercises.

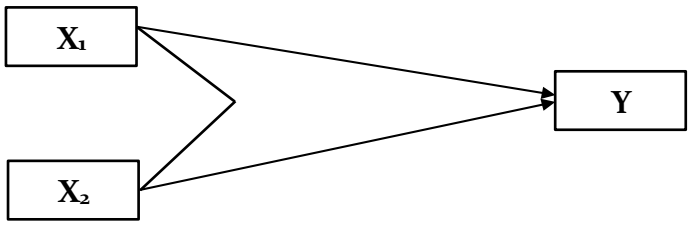

Figure 1. Research Design (one group pre-test and post-test)

3.4. Research Instruments

3.4.1. Vertical Jump Test

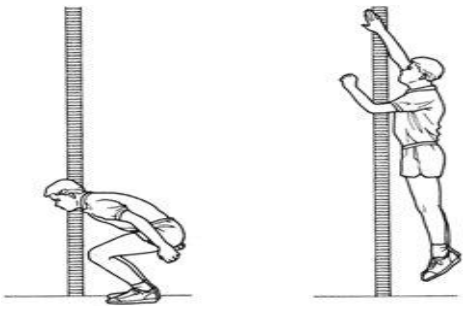

Figure 2. Vertical Jump Test
Source: physioandrehab.net/vertical-jump

The vertical jump test is a test performed by jumping perpendicularly upwards (vertical) using the highest arm reach. This test is an adoption of the vertical jump test without changing the test procedure.

3.5. Data Collection Technique

The data collection technique in this study was carried out by means of tests, both written and field tests. The data to be collected in this study using sports tests and measurements. Back handspring ability with back handspring assessment instrument.

3.6. Data Analysis Technique

Data analysis is the process of simplifying data into a form that is easier to read and present. To analyze data from tests and measurements consisting of two independent variables and one dependent variable, namely split squat jump (X1), clap push-up (X2), and back handspring ability (Y). The data that has been obtained from the initial test results and the final test is processed with statistical procedures using regression, normality test and homogeneity test. To test the hypothesis in this study, the following hypotheses were formulated:

1) First Statistical Hypothesis Test
- Ho: There is no significant contribution of split squat jump training to improving back handspring ability in PERSANI Medan junior male athletes in 2024.
- Ha: There is a significant contribution of split squat jump training to the improvement of back handspring ability in junior male athletes of PERSANI Medan Year 2024.

2) Second Statistical Hypothesis Test
- Ho: There is no significant contribution of clap push-up exercise to the improvement of back handspring ability in junior male athletes of PERSANI Medan Year 2024.
- Ha: There is a significant contribution of clap push-up exercise to the improvement of back handspring ability in junior male athletes of PERSANI Medan Year 2024.

3) Third Statistical Hypothesis Test

- Ho: There is no significant contribution together from split squat jump and clap push-up exercises to improving back handspring ability in PERSANI Medan junior male athletes in 2024.
- Ha: There is a significant contribution together of split squat jump and clap push-up exercises to improve back handspring ability in PERSANI Medan junior male athletes in 2024.

The criteria for testing this hypothesis are:

a) If F-value> F-table (Sig. 0.05), then Ho is rejected and Ha is accepted.

b) If F-value < F-table (Sig. 0.05), then Ho is accepted and Ha is rejected.

4. Results and Discussion

4.1. Research Results

4.1.1. Description of Research Data

Based on the problems contained in the previous section that have been detailed, the results of measurement tests carried out in the field for 6 weeks using research test instruments, namely the Vertical Jump Test (X1), Medicine Ball Test (X2), and Back Handspring Assessment (Y). The data of these test results are obtained from the training variables given, namely: Split squat jump training (to increase leg muscle power), Clap push-ups (to increase arm muscle power), and Back Handspring ability in PERSANI Medan junior male athletes in 2024.

4.1.2. Description of Pre-test and Post-test Vertical Jump Test Data

Based on the results of data analysis on the vertical jump pre-test results obtained data with a score range of 35-42, indicating that the acquisition of the lowest pre-test score with a score of 38 and the highest score with a score of 42, where the average value is 38 and the standard deviation is 2.608.

Table 1. Frequency Distribution of Vertical Jump Test Pre-test Data

No	Interval Class	Frequency
1	35-36	2
2	37-38	2
3	39-40	1
4	41-42	1
Total		6

Therefore, based on the table above, the pre-test results can be used in the form of a histogram, so the following pre-test data in the form of a histogram.

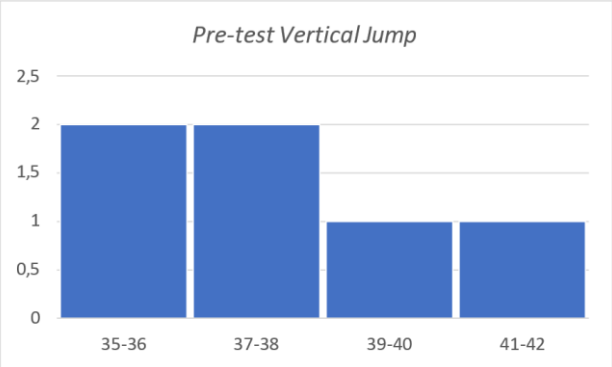

Figure 3. Graph of Vertical Jump Pre-test Results

Then for the results of the split squat jump training post-test, the score range is 38-45, where the lowest score is 38 and the highest score is 45, the average value is 41 and the standard deviation is 2.608.

Table 2. Frequency Distribution of Vertical Jump Test Post-test Data

No	Interval Class	Frequency
1	38-39	2
2	40-41	2
3	42-43	1
4	44-45	1
Total		6

Based on the table above, the post-test can be used in the form of a histogram as follows.

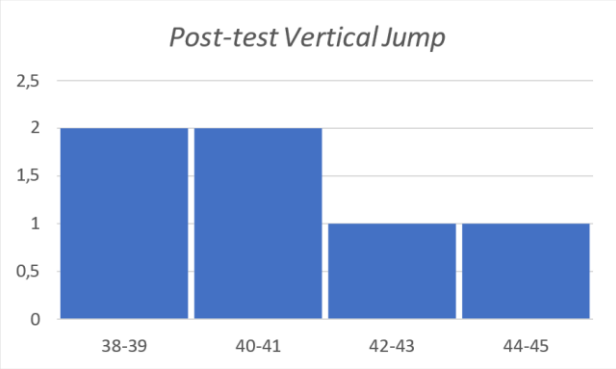

Figure 4. Graph of Vertical Jump Post-test Results

4.1.3. Description of Pre-test and Post-test Medicine Ball Test Data

Based on the results of the medicine ball pre-test data, data was obtained with a score range of 350-400, with an average value of 375 and a standard deviation of 18.7083.

Table 3. Frequency Distribution of Medicine Ball Test Pre-test Data

No	Interval Class	Frequency
1	350-364	2
2	365-379	1
3	380-394	2
4	395-409	1
Total		6

Furthermore, the medicine ball pre-test data can be made in the form of a histogram as follows.

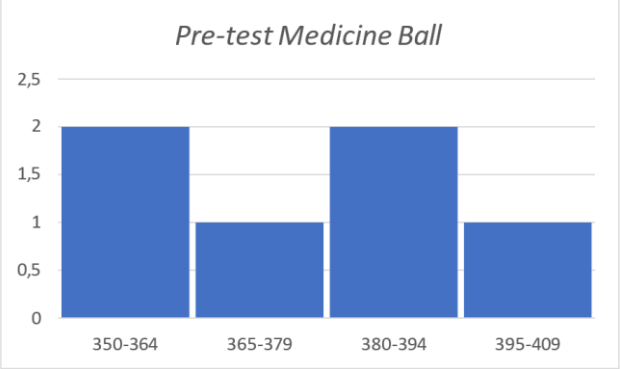

Figure 5. Graph of Medicine Ball Pre-test Results

Then for the post-test results of the clap push-up exercise variable, data was obtained with a score range of 370-430, with an average value of 396.67 and a standard deviation of 21.6025.

Table 4. Frequency Distribution of Medicine Ball Test Post-test Data

No	Interval Class	Frequency
1	370-386	2
2	387-403	2
3	404-420	1
4	421-437	1
Total		6

Based on the table, the post-test data can be made in the form of the following histogram.

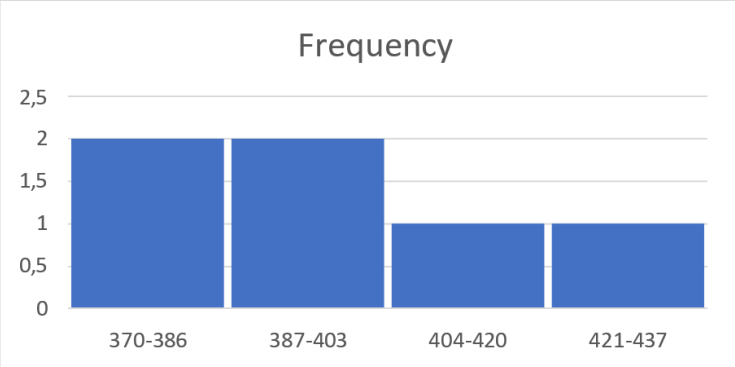

Figure 6. Graph of Medicine Ball Post-test Results

4.1.4. Description of Pre-test and Post-test Back Handspring Ability Test Data

Based on the results of the pre-test back handspring data obtained data with a score range of 5-8, with an average value of 6.5 and a standard deviation of 1.0489.

Table 5. Frequency Distribution of Pre-test Data of Back Handspring Assessment

No	Interval Class	Frequency
1	5-5	1
2	6-6	2
3	7-7	2
4	8-8	1
Total		6

Based on the table, the post-test data can be made in the form of the following histogram.

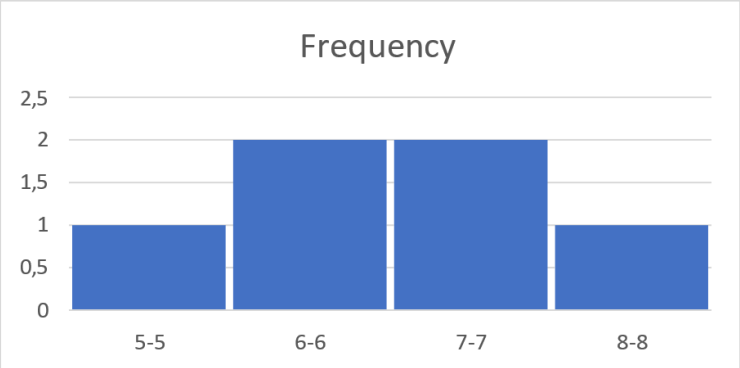

Figure 7. Graph of Pre-test Back Handspring Results

Then for the post-test results of back handspring training, data was obtained with a score range of 6-9, with an average value of 7.5 and a standard deviation of 1.0489.

Table 6. Frequency Distribution of Post-test Data of Back Handspring Assessment

No	Interval Class	Frequency
1	6,5-6,5	1
2	7,5-7,5	2
3	8,5-8,5	2
4	9,5-9,5	1
Total		6

Furthermore, the back handspring post-test data can be made in the form of a histogram as follows.

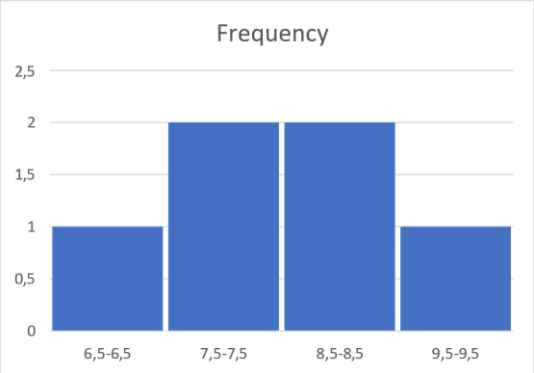

Figure 8. Graph of Back Handspring Test Results

4.1.5. Analysis Requirements Testing

Testing of analytical requirements is carried out to determine whether the data is normally or abnormally distributed, and to determine whether the data comes from homogeneous variances or inhomogeneous variances, before testing the research hypothesis.

A. Normality Test

Normal research sample data is a requirement for using statistics for hypothesis testing. In this study, the data normality test used is Lilifors by comparing L-value with L-table, which if L-value < L-table then Ho is accepted and Ha is rejected with the conclusion that the data is normally distributed, so that it can be continued in the next statistical analysis.

Table 7. Normality test of pre-test data

Variable	Mean & Standard deviation	L-value	L-table	ά	Description
Vertical jump pre-test data	38 2,60768	0,16667	0,319	0,05	Normal
Medicine ball pre-test data	375 18,7083	0,12199	0,319	0,05	Normal
Back handspring pre-test data	6,5 1,04881	0,18322	0,319	0,05	Normal

In testing the normality of this data using the Lilifors Test with the help of Ms.excel. From the vertical jump pre-test data column, it was found that L-value = 0.16667 and L-table = 0.319 with n = 6, and the real level α = 0.05. Therefore, with the price of L-value < L-table = (0.167 < 0.319) it can be concluded that the sample comes from a normally distributed population.

From the medicine ball pre-test data column, it is obtained that L-value = 0.12199 and L-table = 0.319 with n = 6, and the real level α = 0.05. Then with the price of L-value < L-table = (0.122 < 0.319) it can be concluded that the sample comes from a normally distributed population. Then with the price of L-value < L-table = (0.122 < 0.319) it can be concluded that the sample comes from a normally distributed population.

From the pre-test back handspring data column, it is obtained that L-value = 0.18322 and L-table = 0.319 with n = 6, and the real level α = 0.05. Therefore, with the price of L-value < L-table = (0.183 < 0.319) it can be concluded that the sample comes from a normally distributed population.

Table 8. Normality test of post-test data

Variable	Mean & Standard deviation	L-value	L-table	ά	Description
Vertical jump post-test data	41 2,60768	0,16667	0,319	0,05	Normal
Medicine ball post-test data	396,67 21,6025	0,12119	0,319	0,05	Normal
Back handspring post-test data	7,75 0,93541	0,28866	0,319	0,05	Normal

From the vertical jump post-test data column, L-value = 0.16667 and L-table = 0.319 with n = 6, and the real level α = 0.05. So as with the price of L-value < L-table = (0.167 < 0.319) it can be concluded that the sample comes from a normally distributed population.

From the medicine ball post-test data column, it is obtained L-value = 0.12119 and L-table = 0.319 with n = 6, and the real level α = 0.05. Then with the price of L-value < L-table = (0.121 < 0.319) it can be concluded that the sample comes from a normally distributed population. Then with the price of L-value < L-table = (0.121 < 0.319) it can be concluded that the sample comes from a normally distributed population.

From the post-test back handspring data column, it is obtained that L-value = 0.28866 and L-table = 0.319 with n = 6, and the real level α = 0.05. Therefore, with the price of L-value < L-table = (0.289 < 0.319) it can be concluded that the sample comes from a normally distributed population.

B. Homogeneity Test

After testing the normality of the data, now proceed with the data homogeneity test. This aims to test whether the data obtained comes from a homogeneous or inhomogeneous population (variance). In this study using the variance homogeneity test (F test) and with the help of Ms.excel. then for the decision-making criteria in the variance homogeneity test (F test), namely, if the Fvalue value < Ftable, then Ho (null hypothesis) is accepted and Ha (alternative hypothesis) is rejected so it can be concluded that the data comes from a homogeneous population. The following data on the homogeneity test results can be seen in the table below.

Table 9. Variance Homogeneity Test (F Test)

Variable	Mean & Standard deviation	F-value	F-table	ά	Description
Pre-test and Post- test Vertical Jump Data	$\bar{x}_x$ = 38 ; S_x = 6,8 $\bar{x}_y$ = 41 ; S_y = 6,8	1,00	5,05	0,05	Homogenous
Pre-test and Post- test Medicine Ball Data	$\bar{x}_x$ = 375 ; S_x = 350 $\bar{x}_y$ = 396,7; S_y = 466,7	1,33	5,05	0,05	Homogenous
Pre-test and Post- test Back handspring Data	$\bar{x}_x$ = 6,5 ; S_x = 1,1 $\bar{x}_y$ = 7,75 ; S_y = 0,875	0,80	5,05	0,05	Homogenous

The homogeneity test of variance (F test) between the pre-test and post-test vertical jump data obtained F-value = 1.00 and it is known that V1 = 6-1 = 5 while V2 = 6-1 = 5 so that F0.05 (5,5) = 5.05 is obtained at a significant level of 5% or at 0.05, then F-value < F-table, so Ho (null hypothesis) is accepted and Ha (alternative hypothesis) is rejected, it is concluded that the data comes from Homogeneous variance.

The homogeneity of variance test (F test) between the pre-test and post-test medicine ball data obtained F-value = 1.33 and it is known that V1 = 6-1 = 5 while V2 = 6-1 = 5 so that F0.05 (5,5) = 5.05 is obtained at a significant level of 5% or 0.05, then F-value < F-table, so Ho (null hypothesis) is accepted and Ha (alternative hypothesis) is rejected, it is concluded that the data comes from Homogeneous variance.

The homogeneity of variance test (F test) between the pre-test and post-test data of the back handspring ability obtained F-value = 0.80 and it is known that V1 = 6-1 = 5 while V2 = 6-1 = 5 so that F0.05 (5,5) = 5.05 is obtained at a significant level of 5% or 0.05, then F-value < F-table, so that Ho (null hypothesis) is accepted and Ha (alternative hypothesis) is rejected, it is concluded that the data comes from Homogeneous variance.

In order to test the three hypotheses used, namely simple linear regression test, multiple linear regression test, linearity test, significance test, and determination test.

4.1.6. First Hypothesis

The first hypothesis is that there is a contribution of split squat jump training to improving back handspring ability in PERSANI Medan junior male athletes in 2024. The results of testing with a simple linear regression test on the split squat jump training variable (X1) on improving back handspring ability, the data results are presented in the table below.

Table. 10 Hypothesis Testing I Post-test Data

Variable	Regression Equation	Regression Significance		Linear Regression		Coefficient of Determination	ά	R
		F-value	F-table	F-value	F-table			
X1 dan Y	Y= -4,91 + 0,308 X1	11,45	7,71	∞	225	0,74%	0,05	0,86

From the results of testing the first hypothesis, the regression equation Y = -4.91 + 0.308 X1 is obtained. The calculation results for the linearity test with α = 0.05 and dk numerator 4 denominator 0 then from the F distribution list obtained F-table = (225) while for F-value = (∞) so that F-value (not suitable) < F-table, this means Ho is accepted that the regression model is linear. Then the regression significance test has obtained the calculation results of F-value (11.45) and F-table (7.71) so that F-value > F-table, then Ha is accepted, thus F-value (regression) is significant (meaningful), meaning that there is a significant functional relationship between the split squat jump training variable and the ability of back handspring.

From testing this first hypothesis, it can be concluded that "There is a contribution from split squat jump training to improving back handspring ability with the amount of contribution given which is 74.12%, this means that the vertical jump test (X1) contributes to improving back handspring ability by 0.64% and the rest is influenced by other factors.

4.1.7. Second Hypothesis

The second hypothesis is that there is a contribution of clap push-up training to improving back handspring ability in PERSANI Medan junior male athletes in 2024. The results of testing with a simple

linear regression test on the clap push-up exercise variable (X2) on improving back handspring ability, the data results are presented in the table below.

Table 11. Hypothesis Testing II Post-test Data

Variable	Regression Equation	Regression Significance		Linear Regression		Coefficient of Determination	ά	R
X2 dan Y	Y= -5,85 + 0,034 X1	F-value	F-table	F-value	F-table	0,62%	0,05	0,79
		6,72	7,71	∞	225			

From the results of testing the first hypothesis, the regression equation Y = -5.85 + 0.034 X2 is obtained. The calculation results for the linearity test with α = 0.05 and dk numerator 4 denominator 0 then from the F distribution list obtained F-table = (225) while for F-value = (∞) so that F-value (not suitable) < F-table, this means Ho is accepted that the regression model is linear. Then the regression significance test has obtained the calculation results of F-value (6.72) and F-table (7.71) so that F-value < F-table, then Ha is rejected, thus F-value (regression) is insignificant (meaningless), meaning that there is an insignificant functional relationship (meaningless) between the clap push-up exercise variable and the ability of the back handspring. The meaning of insignificant (meaningless) is that the relationship between clap push-up training (X2) and back handspring ability (Y) obtained from this regression equation cannot be generalized to the population, meaning that the regression equation cannot apply to the population, thus this insignificant (meaningless) regression equation cannot make predictions on the population using this regression equation.

From testing the second hypothesis, it can be concluded that "There is a contribution from clap push-up training to improving the ability of back handspring with the amount of contribution given is 62.70%, this means that the medicine ball test (X2) contributes to improving the ability of back handspring and the rest is influenced by other factors.

4.1.8. Third Hypothesis

The results of testing with multiple linear regression tests on split squat jump training variables (X1) and clap push-up training (X2) on improving back handspring ability, the data results are presented in the table below.

Table 12. Hypothesis Testing III Post-test Data

Variable	Regression Equation	Regression Significance	
		F-value	F-table
X1 and X2 to Y	Y = – 4,84 + 0,32 X1 – 0,00085 X2	4,30	9,55
	Coefficient of Determination	R	ά
	74,12%	0,86	0,05

The multiple regression equation between split squat jump training (X1) and clap push-up training (X2) on improving back handspring ability (Y) is (Y = - 4.84 + 0.32 X1 - 0.00085 X2) in the sense that to improve back handspring ability is highly dependent on vertical jump by (0.32 units) because explosive jumps have a much greater influence than medicine ball by (0.00085 units).

Furthermore, the regression significance test is carried out using the F test from the results of the calculations that have been carried out obtained a value of (F-value = 4.30) and (F-table = 9.55). Drawing conclusions, because the price of F-value < F-table, so that the null hypothesis (Ho) is accepted and the alternative hypothesis (Ha) is rejected, thus F-value (regression) is insignificant (meaningless), meaning that there is an insignificant functional relationship (meaningless) between the variables of vertical jump training and clap push-up training on back handspring ability. The meaning of insignificant

(meaningless) is that the relationship between split squat jump training (X1) and clap push-up training (X2) to back handspring ability (Y) obtained from this regression equation cannot be generalized to the population, meaning that the regression equation cannot apply to the population, thus this insignificant (meaningless) regression equation cannot make predictions on the population using this regression equation.

While the correlation coefficient obtained is 0.86, which has a strong relationship. The coefficient of determination of 74.12% explains that split squat jump training (X1) and clap push-up training (X2) have an influence of 74.12% on improving back handspring ability, while 25.88% is influenced by other variables. Thus, it can be concluded that there is a contribution of split squat jump training (X1) and clap push-up training (X2) to improving back handspring ability in PERSANI Medan junior male athletes in 2024.

4.2. Discussion

In discussing the results of the research and analyzing the results of the research that has been done. This research is entitled the contribution of split squat jump and clap push-up exercises to improving back handspring ability in PERSANI Medan junior male athletes in 2024, which has been carried out according to the established research methodology and analyzed in depth so that it can be easily understood.

The results of testing the First Hypothesis, in the post-test data, it is known that there is a contribution from split squat jump training to improving back handspring ability in PERSANI Medan junior male athletes in 2024. The simple regression equation in testing the first hypothesis of this post-test data is = -4.91+ 0.308 X1 and then the results of testing the meaning of regression which states that because F-value = 11.45 < F-table = 7.71, this means that the price of F-value > F-table, so that the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted, thus Fhitung (regression) is significant (meaningful).

Split squat jump training contributes to improving the back handspring ability of PERSANI Medan's junior male athletes in 2024. This is because the split squat jump exercise is an exercise to increase the explosive power of the athlete's leg muscles, this statement is supported by Hansen (2017) which states that to have good leg muscle explosiveness, one form of exercise is the split squat jump. This exercise strengthens the leg muscles, hips, abdomen and coordination where to improve back handspring ability requires leg muscle power, hips, balance and coordination. This is supported by (Fis Andriyani, 2012) which states that the factors that affect the ability of back handspring in artistic gymnastics are physical abilities including leg muscle power, arm muscle power and flexibility which affect gymnasts in doing back handspring. With the need for large leg muscle explosive power, that is what underlies the researcher taking this exercise to increase leg muscle explosive power. This can be seen in the statistical results which show that split squat jump training contributes 74.12% to improving the back handspring ability of PERSANI Medan junior male athletes in 2024.

The results of testing the Second Hypothesis, in the post-test data, it is known that there is a contribution from clap push-up training to improving back handspring ability in PERSANI Medan junior male athletes in 2024. This second hypothesis has a simple regression equation on the post-test data, namely Y = -5.85 + 0.034 X2, and then the results of testing the meaningfulness of the regression state that (F-value = 6.72) and (F-table = 7.71), this means that the price of F-value < F-table, so that the null hypothesis (Ho) is accepted and the alternative hypothesis (Ha) is rejected, thus Fhitung (regression) is not significant (meaningless).

Clap push-up training performed for 6 weeks is proven to increase the explosive power of the athlete's arm muscles, this can be seen from the amount of contribution made from clap push-up

training to the ability to back handspring. Clap push-up training is an exercise to train athletes' arm muscle power, by doing this exercise it can help in doing back handspring movements. This statement is supported by (Syariofeddi et al., 2020) which states that clap push-ups train explosive power in the arms and chest. This clap push-up exercise is an exercise to increase the explosive power of the arm muscles, where to improve the ability to back handspring requires arm muscle power, balance and coordination. This is supported by expert opinion, namely (Andriyani, 2012) stating that back handspring can be influenced by several factors including arm muscle explosiveness, leg muscle explosiveness, coordination, balance, speed, training programs, athlete confidence, facilities and infrastructure and motivation. With the need for great arm muscle explosiveness, that is what underlies the researcher taking this exercise to increase arm muscle explosiveness. This can be seen in the statistical results which show that clap push-up training contributes 62.70% to improving the back handspring ability of PERSANI Medan junior male athletes in 2024.

The results of testing the Third Hypothesis, in the post-test data, it is known that there is a contribution from split squat jump and clap push-up exercises to improving back handspring ability in PERSANI Medan junior male athletes in 2024. The multiple linear regression equation in testing the second hypothesis of this post-test data is Y = - 4.84 + 0.32 X1 - 0.00085 X2 and then the results of testing the meaningfulness of the regression state that (F-value = 4.30) and (F-table = 9.55), this means that the price of F-value < F-table, so that the null hypothesis (H0) is accepted and the alternative hypothesis (Ha) is rejected, thus F-value (regression) is not significant (meaningless). Furthermore, determination is carried out to see the contribution of split squat jump and medicine ball exercises together amounting to 74.12%.

It can be explained that there is a joint contribution of split squat jump and clap push-up exercises to improving back handspring ability in PERSANI Medan junior male athletes in 2024. This shows that to increase success in the back handspring movement, it is also necessary to increase physical condition factors, namely leg muscle explosive power and arm muscle explosive power, these two physical conditions can be improved by doing split squat jump and clap push-up exercises as described in the section above and supported by statistical testing which shows how many percent of the contribution of each exercise. These two physical condition factors should not be forgotten in the application of the training program, because the two physical condition factors are mutually sustainable in improving the ability of the back handspring.

As for some things that can influence the improvement of back handspring abilities, including athlete talent, athlete interest, athlete motivation in training, athlete activities outside of training, food intake consumed by athletes.

5. Conclusion

Based on the results of the analysis, hypothesis testing, and discussion carried out by the researcher, it can be concluded that there is a significant contribution of split squat jump training to the improvement of back handspring ability in PERSANI Medan junior male athletes in 2024 by 74.12%. On the other hand, clap push-up exercise shows an insignificant contribution to improving back handspring ability, with a contribution of 62.7%. In addition, together, split squat jump and clap push-up exercises also did not make a significant contribution to improving back handspring ability in PERSANI Medan's 2024 junior male athletes, with a contribution of 74.12%.

As a follow-up to the results of this study, the researcher provides several suggestions that are expected to be considered to improve the results of the back handspring movement. First, the results showed that the application of split squat jump and clap push-up exercises can improve back

handspring ability, so it is hoped that PERSANI coaches, in particular, can integrate the two exercises to improve athletes' ability to perform these movements. Secondly, for coaches, sports teachers and sports coaches who want to improve leg muscle and arm muscle power, as well as the results of movements such as the back handspring, it is important to pay attention to appropriate forms and training programs, such as those found in the contribution of split squat jump and clap push-up exercises. Thirdly, for readers who want to extend the results of this study, it is recommended to conduct further research using a larger sample in different places and times, so as to produce more significant and useful findings to be applied in everyday life.

6. References

Adi, S. (2018). Bentuk-Bentuk Dasar Gerakan Senam. *Universitas Negeri Malang, Fakultas Ilmu Keolahragaan*.

Akhmad, I. (2013). *Dasar-dasar melatih fisik Olahragawan*. Medan: Unimed Press.

Andriyani, F. (2012). *Dr. Olahraga Menjelaskan Senam Lantai*. Pt Balai Pustaka (Persero).

Apriadi, K. (2012). *Penerapan metode bermain untuk meningkatkan keterampilan senam lantai guling depan kelas VII G di SMP Negeri 1 Sukorejo Kabupaten Pasuruan*. Universitas Negeri Malang.

Bompa, T. O. (1983). Theory and methodology of training. *Dubuque, IA: Kendall/Hunt*, 91–97.

Harsono, H. (2015). Kepelatihan olahraga, teori dan metodologi. *Jakarta: Remaja Rosdakarya*.

Hidayat, I. (1996). Senam. *Bandung: FPOK-IKIP Bandung*.

Hidayat, I., & Panggabean, P. (1983). Senam dan Metodik. *Jakarta: Depdikbud Jogiyanto.(2014). Pedoman Survei Kuesioner. Yogyakarta: BPFE*.

La Porte, W. R., & Renner, A. G. (1938). *The tumbler's manual*. Prentice Hall.

Mahendra, A. (2000). Senam. *Jakarta: Dirjen Dikdasmen Depdiknas*.

Margono, A. (2009). Senam. *Surakarta: UNS Pres*.

Sajoto, M. (1995). *Peningkatan & pembinaan kekuatan kondisi fisik dalam olah raga*. Dahara Prize.

Sajoto, M. (2021). *Pembinaan kondisi fisik dalam olahraga*. Dep Dik Bud Direktorat Jenderal Pendidikan Tinggi Proyek Pengembangan.

Soekarno, W. (1985). Teori dan praktek senam dasar. *Yogyakarta: Intan Pariwara*.

Sudjana, S. (1992). Metode Statistik (Statistic Method). *Tarsito, Bandung*.

Sugiyono. (2013). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Alfabeta.

Syariofeddi, E. W., Kusumah, D. W. C. W., & Novijayanti, N. (2020). Pengaruh Latihan Clapping Push Up Dan Decline Push Up Terhadap Power Otot Lengan Pada Atlet Tarung Derajat Kabupaten Lombok Tengah Tahun 2020. *JUPE: Jurnal Pendidikan Mandala*, *5*(5).

Wahyuni, S., Awal, M., Islam, F., & Thahir, M. (2023). Beda Pengaruh Plylometric Exercise Jump To Box Dan Split Squat Jump Terhadap Peningkatan Daya Ledak Otot Tungkai Pada Pemain Bola Basket Di Fakultas Ilmu Keolahragaan Universitas Negeri Makassar: Different Effect of Plyometric Exercise Jump To Box And Spl. *Media Fisioterapi Politeknik Kesehatan Makassar*, *15*(1), 1–7.

Werner, P. H., Williams, L. H., & Hall, T. J. (2012). *Teaching children gymnastics*. Human Kinetics.