

The Effect of Weight Training on the Kicking Ability of Female Soccer Players in Jember

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Abstract: The development of soccer in the world is rapidly advancing, driven by increasingly advanced technology, pushing the world of soccer towards a more modern direction. Soccer has become the most popular sport globally, a sport that can be played by people of all ages and genders. The public's interest in soccer knows no boundaries; anyone can play it. While soccer is predominantly played by men, it is also a sport that can be played by women. Women's soccer in Indonesia is gaining popularity, even though not many women participate in it. Jember Putri is one of the women's soccer clubs in Jember. Improving the athletes' abilities must be carefully considered to enhance the skills and physical endurance of each individual. There are many methods that can be used in athlete development, one of which is weight training.

Keywords: weight training, soccer, female athletes

Introduction

Sports are becoming increasingly popular among many people, and the interest in a healthy lifestyle through sports has become a driving force for individuals to engage in healthy activities daily and maintain a balanced life, including a healthy diet and other aspects. Health-related factors have also led to a growing awareness among people to adopt healthy activities in their lives. The importance of maintaining good health compels everyone to engage in physical activities, thus avoiding various diseases. Many people face health issues due to an imbalanced lifestyle, making their bodies susceptible to various ailments. Inadequate physical activity can contribute to health problems, especially those related to the heart and blood vessels (Bennett, 2019; Joergensen, 2018; Lord, 2018).

Sports are physical and psychological activities that serve to maintain and improve the overall health of individuals. Sports are popular among people of all ages, from children and teenagers to adults and seniors. Sports also serve as a means to support both physical and mental well-being (Putri et al., 2019). Sports are considered activities that help maintain and enhance the overall health of individuals after engaging in them ((Coratella, 2019)Salahudin & Rusdin, 2020). In essence, sports can be regarded as physical and psychological activities that are beneficial for maintaining and improving overall health (Cross, 2018).

Soccer is a game played by two teams, each consisting of 11 players. Soccer is a complex sport in terms of skills, and therefore, athletes must possess quick and accurate ball-handling skills (Aselp Sudharto et al., 2020; Barone, 2018; Burland, 2021; Leyhr, 2021; Sekulic, 2021)). Soccer demands a higher level of player skill compared to many other sports. There are several basic techniques that must be mastered, and one of these is dribbling and passing the ball (Raharjo, 2018). These basic techniques are fundamental to the game of soccer and should be mastered by every soccer player (Bouguezzi, 2020; Emmonds, 2019; Rada, 2019; Wyke, 2019).

One of the platforms for female soccer players is located in Jember. The female soccer club is called "Jember Putri," and it provides a place for women to play soccer in Jember(Nesbitt, 2018; Ren, 2020; Tribolet, 2018). Jember Putri aims to expand knowledge and improve skills in various aspects of soccer. Additionally, the club serves as a platform to develop the potential of female soccer players in the Jember area, contributing to the development of female players in the region(Bult, 2018).

This study serves as evidence of the improvement in athletic abilities through specialized training tailored to the sport of interest. The findings (Septianingrum et al., 2022) revealed a significant influence of weight training on the results of long-pass kicks (García-Ramos, 2018; Höner, 2021). This indicates that there was an 8.69% increase in the ability to perform long-pass kicks following weight training.

This result demonstrates the role of weight training in enhancing long-passing abilities. Previous research has shown a significant improvement after athletes received training without weight training (Branquinho, 2020; Leyhr, 2021; Ramirez-Campillo, 2018a, 2018b). This study, which focuses on two groups: control group and experimental group, demonstrates that athletes still experience improvement even with regular training without weight training. This aspect was not explained in previous research and will be further

explored in this study. The focus of this research is to investigate the impact of weight training on the kicking ability of Jember Putri female soccer players.

Methodology

The research conducted is quantitative in nature, utilizing an experimental research approach. The study investigates the influence of weight training on the kicking ability of female soccer athletes from Jember Putri. A sample of 20 female athletes was selected for the study. The population includes all female soccer athletes of Jember Putri in the Jember Regency, totaling 20 athletes. The sampling method used in this research is through assessing the ability to perform long-pass kicks.

There were two groups in the study: the control group and the experimental group. Each group consisted of 10 female athletes. The first group, referred to as Group A, received regular training over a period of 2 months, with additional weight training sessions aimed at improving their kicking ability. The additional training program for Group A included exercises such as Dumbbell Squat, Lunges, and lying Leg Raises. The objective of this study is to compare the impact of weight training on the kicking ability of athletes between these two groups.

The instruments used to assess the kicking ability of female soccer athletes are as follows:

1. Kicking Ability Test
 - a. Test Objective

The objective of this test is to measure the level of kicking ability.
 - b. Equipment
 - Soccer field
 - Rolled mat
 - Cones or markers
 - Ball
 - c. Test Personnel
 - Personnel for measurement
 - Personnel for recording scores
 - d. Test Preparation
 - The researcher prepares the necessary equipment.
 - The field is measured to mark the designated areas.
 - e. Test Execution
 - Each athlete stands in the designated area.
 - The kicking test is performed, starting with Group A and then proceeding to the next group.
 - Kicking is performed according to the researcher's instructions.
 - Measurement personnel are ready to take measurements, and score-recording personnel are prepared to record scores.
 - f. Measurement Steps
 - Each group stands behind the marked line.
 - Once the instructions are given, athletes begin kicking.

- Measurement personnel enter the field to measure the kicks along with score-recording personnel.
- The kicking test is performed twice, as a pre-test (before the training program) and a post-test (after the training program).

Week	Monday	Wednesday	Saturday	Goal	Description
1	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 8x, Lunges 8x, Lying Leg Raises 8x.	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 8x, Lunges 8x, Lying Leg Raises 8x.	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 8x, Lunges 8x, Lying Leg Raises 8x.	Maintain physical condition and increase leg muscle mass. Jogging for 5 minutes, stretching, samba. Defensive strategy training with a 3-5-2 formation. Followed by weight training: Dumbbell Squat, Lunges, Lying Leg Raises, with 2 sets in each repetition. A 10-second rest between each set.	
2	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 8x, Lunges 8x, Lying Leg Raises 8x.	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 8x, Lunges 8x, Lying Leg Raises 8x.	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 8x, Lunges 8x, Lying Leg Raises 8x.	Maintain physical condition and increase leg muscle mass. Jogging for 5 minutes, stretching, samba. Defensive strategy training with a 3-5-2 formation. Followed by weight training: Dumbbell Squat, Lunges, Lying Leg Raises, with 2 sets in each repetition. A 10-second rest between each set.	
3	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 10x, Lunges 10x,	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell	Maintain physical condition and increase leg muscle mass. Jogging for 5 minutes, stretching, samba. Defensive strategy training with a 3-5-2	

Week	Monday	Wednesday	Saturday	Goal	Description
	Squat 10x, Lunges 10x, Lying Leg Raises 10x.	Lying Leg Raises 10x.	Squat 10x, Lunges 10x, Lying Leg Raises 10x.	formation. Followed by weight training: Dumbbell Squat, Lunges, Lying Leg Raises, with 3 sets in each repetition. A 10- second rest between each set.	
4	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 10x, Lunges 10x, Lying Leg Raises 10x.	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 10x, Lunges 10x, Lying Leg Raises 10x.	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 10x, Lunges 10x, Lying Leg Raises 10x.	Maintain physical condition and increase leg muscle mass. Jogging for 5 minutes, stretching, samba. Defensive strategy training with a 3-5-2 formation. Followed by weight training: Dumbbell Squat, Lunges, Lying Leg Raises, with 3 sets in each repetition. A 10- second rest between each set.	
5	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 12x, Lunges 12x, Lying Leg Raises 12x.	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 12x, Lunges 12x, Lying Leg Raises 12x.	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 12x, Lunges 12x, Lying Leg Raises 12x.	Maintain physical condition and increase leg muscle mass. Jogging for 5 minutes, stretching, samba. Defensive strategy training with a 3-5-2 formation. Followed by weight training: Dumbbell Squat, Lunges, Lying Leg Raises, with 4 sets in each repetition. A 15- second rest between each set.	
6	Warm-up, stretching, samba. Soccer tactics and strategies.	Warm-up, stretching, samba. Soccer tactics and strategies.	Warm-up, stretching, samba. Soccer tactics and strategies.	Maintain physical condition and increase leg muscle mass. Jogging for 5 minutes, stretching,	

Week	Monday	Wednesday	Saturday	Goal	Description
	Weight training: Dumbbell Squat 12x, Lunges 12x, Lying Leg Raises 12x.	Weight training: Dumbbell Squat 12x, Lunges 12x, Lying Leg Raises 12x.	Weight training: Dumbbell Squat 12x, Lunges 12x, Lying Leg Raises 12x.	samba. Defensive strategy training with a 3-5-2 formation. Followed by weight training: Dumbbell Squat, Lunges, Lying Leg Raises, with 4 sets in each repetition. A 15-second rest between each set.	
7	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 14x, Lunges 14x, Lying Leg Raises 14x.	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 14x, Lunges 14x, Lying Leg Raises 14x.	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 14x, Lunges 14x, Lying Leg Raises 14x.	Maintain physical condition and increase leg muscle mass. Jogging for 5 minutes, stretching, samba. Defensive strategy training with a 3-5-2 formation. Followed by weight training: Dumbbell Squat, Lunges, Lying Leg Raises, with 5 sets in each repetition. A 15-second rest between each set.	
8	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 14x, Lunges 14x, Lying Leg Raises 14x.	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 14x, Lunges 14x, Lying Leg Raises 14x.	Warm-up, stretching, samba. Soccer tactics and strategies. Weight training: Dumbbell Squat 14x, Lunges 14x, Lying Leg Raises 14x.	Maintain physical condition and increase leg muscle mass. Jogging for 5 minutes, stretching, samba. Defensive strategy training with a 3-5-2 formation. Followed by weight training: Dumbbell Squat, Lunges, Lying Leg Raises, with 5 sets in each repetition. A 15-second rest between each set.	

Result and Discussion

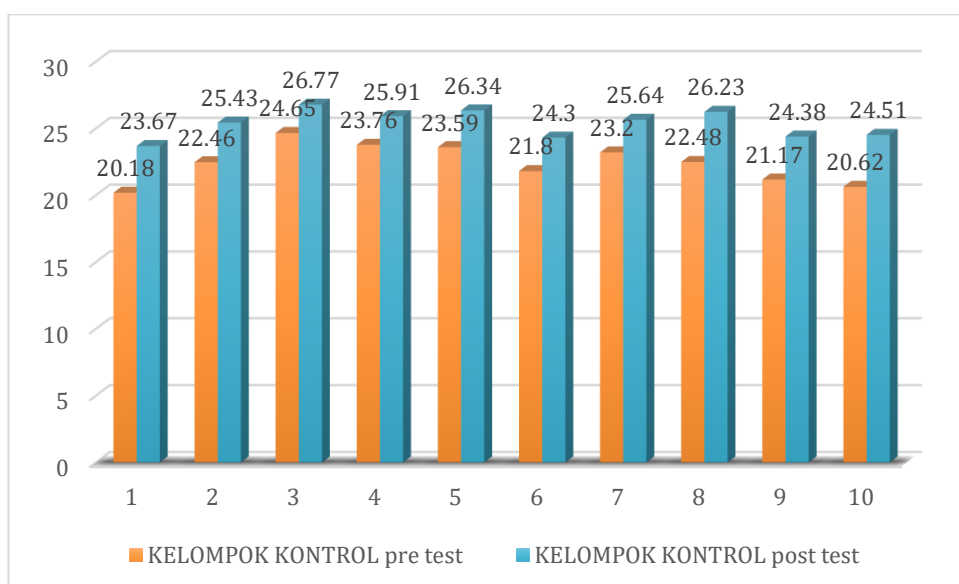
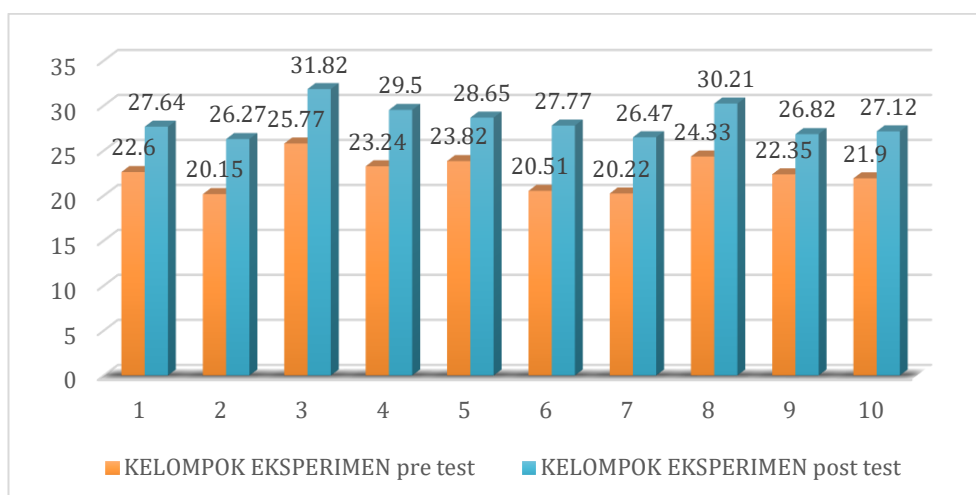
Before conducting normality and homogeneity tests, descriptive analysis is required. The data collected represents the results of tests and measurements of kicking ability with long pass, both in pre-test and post-test conditions. The tests were conducted on two groups: the experimental group and the control group. The experimental group received treatment with additional strength training, while the control group underwent regular training.

Below are the results of the pre-test and post-test for both groups, the experimental group, and the control group, after undergoing training for 2 months with 24 training sessions, with training conducted 3 times a week.

Tabel 4.1 Pre-Test and Post-Test Results

CODE	CONTROL GROUP	
	pre test	post test
TA	20.18	23.67
YY	22.46	25.43
MR	24.65	26.77
MT	23.76	25.91
WW	23.59	26.34
PY	21.80	24.30
PV	23.20	25.64
VP	22.48	26.23
RS	21.17	24.38
TR	20.62	24.51

CODE	EXPERIMENT GROUP	
	pre test	post test
AP	22.60	27.64
SA	20.15	26.27
AK	25.77	31.82
DP	23.24	29.50
SF	23.82	28.65
AT	20.51	27.77
SP	20.22	26.47
ZJ	24.33	30.21
EH	22.35	26.82
UM	21.90	27.12



From the results in the table and diagram above, we can understand that there is an improvement in each group after the training for each group. The data analysis results are presented in the following descriptive statistics table:

Table 4.2 Descriptive Data Table

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Pretest Eksperimen	10	20.15	25.77	22.4890	1.86798
Posttest Eksperimen	10	26.27	31.82	28.2270	1.80483
Pretest Kontrol	10	20.18	24.65	22.3910	1.45094
Posttest Kontrol	10	23.67	26.77	25.3180	1.04009
Valid N (listwise)	10				

Based on the descriptive statistics table above, after conducting pre-tests and post-tests in the experimental and control groups, we can observe the following results:

For the experimental group:

- The average pre-test score is 22.4890, and the post-test score is 28.2270.
- The standard deviation for the pre-test is 1.86798, and for the post-test, it is 1.80483.
- The minimum pre-test score is 20.15, and the maximum pre-test score is 25.77.
- The minimum post-test score is 26.27, and the maximum post-test score is 31.82.

For the control group:

- The average pre-test score is 22.3910, and the post-test score is 25.3180.
- The standard deviation for the pre-test is 1.45094, and for the post-test, it is 1.04009.
- The minimum pre-test score is 20.18, and the maximum pre-test score is 24.65.
- The minimum post-test score is 23.67, and the maximum post-test score is 26.77.

Before conducting a normality test, it's essential to understand the decision-making criteria for the Kolmogorov-Smirnov normality test:

1. If the significance value (sig) is > 0.05 , the data is normally distributed.
2. If the significance value (sig) is < 0.05 , the data for the research is not normally distributed.

Table 4.3 Normality Test

Group	Kolmogorov-Smirnov ^a		
	Statistic	df	Sig.
Pre-Test Experimental	.155	10	.200*
Post-Test Experimental	.200	10	.200*
Pre-Test Control	.119	10	.200*
Post-Test Control	.181	10	.200*

Based on the results of the normality test conducted using SPSS version 26, it was found that both groups, both during the pre-test and post-test, have data with a normal distribution, which is indicated by a significance value (sig) of 0.200. The statistical testing criterion states that if $\text{sig} > 0.05$, the data is considered normal. In the table above, it can be seen that the sig is greater than 0.05.

Next, a homogeneity test will be conducted. The purpose of this homogeneity test is to determine whether the two groups come from populations with equal variances. The results of the homogeneity test are as follows:

Test of Homogeneity

Test of Homogeneity of Variance				
	Levene Statistic	df1	df2	Sig.
Based on Mean	2.912	1	18	.105
Based on Median	1.399	1	18	.252
Based on Median and with adjusted df	1.399	1	12.601	.259
Based on trimmed median	2.585	1	18	.125

In the table above, it can be concluded that both groups have homogenous variances. Referring to the significance value in statistical rules, if the value of sig > 0.05, it can be concluded that the variances in each group are equal or homogenous. Once normality and homogeneity of variances tests have been conducted, the next step is the t-test.

The t-test aims to determine the influence of training treatment on Dumbbell exercises. In SPSS, the t-test is referred to as the paired t-test. Data analysis regarding the t-test can be seen in the following table.

Paired Samples Test

		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	Pre-test	-	.83682	.26462	-6.33662	-5.13938	-	9	.000
	Experiment	5.7380					21.684		
	Post-test	0							
	Experiment								
Pair 2	Pre-test	-	.64199	.20302	-3.38626	-2.46774	-	9	.000
	Experiment	2.9270					14.418		
	Post-test	0							
	Experiment								

Based on the table above, the results of the t-test indicate that the t-values for the Elkspeprimeln group and the Kolntroll group are -21.684 and -14.418, respectively. Additionally, the p-values (two-tailed) for both groups are 0.000. The t-test results are essential in answering the research question of whether there is an effect of weight training on the ability of female volleyball athletes.

The decision-making basis for the null hypothesis is that if the p-value is less than 0.05, the null hypothesis is rejected, indicating a significant difference. Referring to the table above, for the Elkspeprimeln group, the p-value is 0.000, leading to the conclusion that there

is a significant difference before and after the weight training intervention, thereby rejecting the null hypothesis.

In the case of the Kolntroll group, when examining the p-value from the data in the table, it also suggests a significant difference before and after the intervention. However, when looking at the actual data, both groups show improvement, with the Elkspelrimeln group exhibiting a larger average increase of 7.40% compared to the 3.76% increase in the Kolntroll group.

Based on the calculated data, it can be concluded that the group trained with weight training, specifically the Elkspelrimeln group, showed a greater improvement compared to the group trained with regular exercises.

Conclusion

Based on the results of the research conducted by the researcher on the "Effect of Weight Training on the Volleyball Skills of Female Junior High School Athletes," the paired t-test was performed. The t-test results showed that the t-value for the Experiment group was -21.684, while the t-value for the control group was -14.418. Additionally, the p-values (two-tailed) for both the Experiment and Control groups were found to be 0.000.

The decision-making criterion for the null hypothesis is that if the p-value is less than 0.05, the null hypothesis is rejected, indicating a significant difference. Referring to the table above, for the Experiment group, the p-value is 0.000, leading to the conclusion that there is a significant difference before and after the weight training intervention. This suggests that the null hypothesis is rejected, signifying a significant improvement.

Similarly, for the Control group, when examining the p-value from the data presented in the table, it also suggests a significant difference before and after the intervention. However, when looking at the actual data, both groups show improvement. The Experiment group exhibited a larger average increase of 7.40% compared to the 3.76% increase in the Control group.

Based on the calculated data, it can be concluded that the group trained with weight training, specifically the Experiment group, showed a greater improvement in their volleyball skills compared to the group trained with regular exercises.

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