



The Effect of Lunges Jump Training on Back Kick Technique of Kabaddi Athletes

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Abstract

Observations of kabaddi players or athletes in Central Java reveal weaknesses in applying this technique on the field, particularly regarding maintaining a safe distance and strength. This study aims to explore the effect of lunge jump training on the back kick technique used by Kabaddi players in Central Java Province in 2025. This study is a quantitative study using an experimental method. It employs a one-group pre-test and post-test design. The study involved 30 kabaddi athletes in Central Java as the sample or research subjects. The instrument used in this study was a test to measure the distance of backward kicks. The data analysis techniques in this study include prerequisite tests: normality and homogeneity tests, and hypothesis testing: the Paired Sample T-Test. The results of this study show that the average backward kick distance during the pre-test was 72.45 cm, and the average backward kick distance during the post-test was 79.20 cm. The normality test results showed that the data had a normal distribution ($p > 0.05$), and the homogeneity test proved that the variance of the data was consistent. The paired sample t-test resulted in a significant value of $p = 0.000$ ($p < 0.05$), indicating that lunge jump training improved the back kick technique of Kabaddi players in Central Java Province.

How to Cite

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INTRODUCTION

Sport is a physical activity that involves both human physical and mental qualities with the goal of enhancing fitness, health, and general quality of life. Sports, in terms of education and achievement, serve not only as enjoyable activities, but also as a vehicle for full human development by improving physical, technical, tactical, and psychological components. As a result, achievement-oriented sports necessitate a rigorously structured, organized, and ongoing training program to enable athletes to achieve peak performance levels. Kabaddi is a fast-growing sport with severe rivalry. Kabaddi is a team sport where two teams alternate between offensive and defensive duties, with a player known as a raider seeking to touch members of the opposing team before returning to their own side without being captured within a specific time frame (Dewanti et al. 2025). Kabaddi's dynamic, energetic, and contact-heavy character requires exceptional physical fitness as well as complex technical ability (Subekti et al. 2023).

The kabaddi playing area has specified dimensions and zones that influence player mobility and strategy during the game. Understanding the court layout is critical since it immediately affects a player's situational awareness, whether attacking or defending. Players must use the given area intelligently to create scoring opportunities while avoiding capture by their opponents.



Figure 2. Kabaddi Game Play
Source: (News 2023)

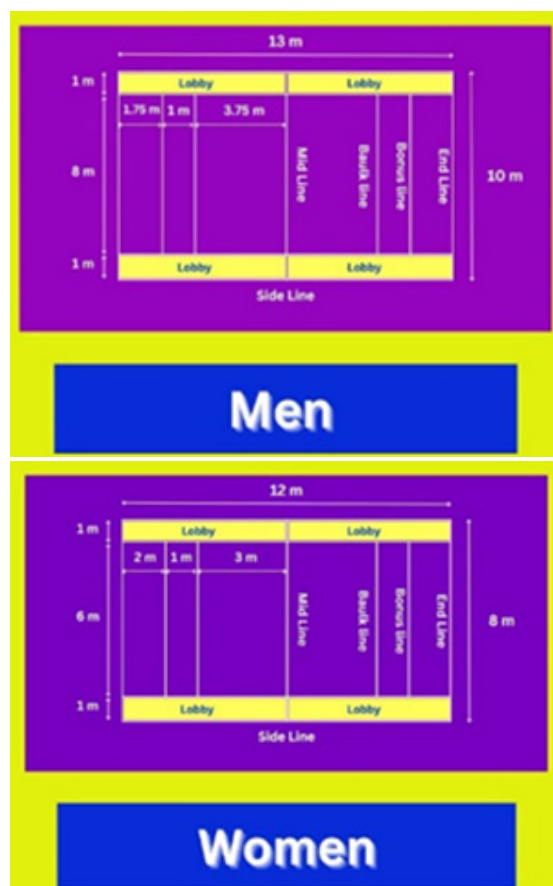


Figure 1. Kabaddi Court
Source: (RacketSports 2025)

Kabaddi started in India and was regarded as a traditional pastime for thousands of years before growing into a competitive sport with global recognition. Its global visibility skyrocketed following its participation in the Asian Games. Federasi Olahraga Kabbadi Seluruh Indonesia (FOKSI) is the governing body for the sport of kabaddi in Indonesia. The sport of kabaddi is growing in popularity across various regions, particularly in Central Java. A systematic training program focused on improving physical fitness, technical skills, and psychological factors is, in essence, the primary indicator of an athlete's development (Candra et al. 2025). In kabaddi, athletes require physical abilities that include strength, agility, balance, endurance, and explosive power. Explosive power is derived from the lower leg muscles. Kabaddi, a sport dominated by lower-body function, requires these components to ensure dynamic movement during play (Subekti & Santika 2021). An athlete's ability to jump, push off, and strike is directly related to these physical components.

The backward kick is a technique in kabaddi that requires maximum explosive strength in the lower body. This technique involves a kabaddi player or athlete kicking backward while maintaining a safe distance to avoid a counterattack (tackle) from the opponent. The physical components that support a player's success in executing this technique include

strength, speed, coordination, and reaction time (Lakshmanan & Kavitha 2025). However, observations and evaluations of kabaddi players or athletes in Central Java indicate that there are weaknesses in executing this technique on the field, particularly regarding maintaining a safe distance and strength

This finding indicates the importance of implementing a specialized training program designed to enhance explosive strength in the lower extremities. Plyometric training is one effective method for improving explosive power. This type of training emphasizes movements that utilize the muscle stretch-shortening cycle to increase strength and speed (Prakash et al. 2021). One type of plyometric exercise commonly used by athletes is the lunges jump exercise.



Figure 3. Back Kick Movement
Source: (PKL 2018)

The lunges jump is a jumping exercise in which the legs alternate between a front and back position. This type of exercise is effective in strengthening the lower-body muscles, thereby enhancing explosive power, balance, and coordination. The increased lower-body explosive power resulting from lunges jumps enables kabaddi athletes to improve their back kick technique performance.

As a type of exercise that develops explosive power, balance, and body coordination, lunges can be incorporated into a training program designed to improve the lower-body strength of Kabaddi athletes when executing the backward kick technique. This is particularly relevant to the needs of Kabaddi athletes in Central Java, who currently lack the necessary strength and proficiency in performing this technique. A study by Astuti & Jatmiko (2020) indicates that lunges influence lower-body muscle strength. As a form of plyometric exercise, lunges also contribute to improved lower-body balance and control (Nugroho, Trisnowiyanto, & Wulandari 2023).

Given this background, the researchers were interested in examining the effects of jump

lunges on the back kick technique of kabaddi athletes in Central Java. Previous studies have primarily focused on analyzing the effectiveness of lunges on lower-body muscle strength in kabaddi athletes (Zulfani, Suratmin, & Swadesi 2026). Meanwhile, research examining the use of plyometric training methods to improve techniques in kabaddi remains very limited. The purpose of this study is to analyze the effect of lunge jump training on the back kick technique used by Kabaddi players in Central Java Province in 2025.

METHOD

This study employed a quantitative approach using an experimental research methodology. The methodology utilized was a single-group pre-test and post-test design, in which a single group of participants was assessed before and after a specific training intervention. This methodology was used to investigate performance changes resulting from a lunge jump training program. The participants in this study were 30 male Kabaddi players from Central Java Province who met the established inclusion criteria. Each subject was an active, trained athlete who remained in good physical condition throughout the experiment. A total sample was used, with all athletes meeting the criteria serving as research subjects. The intervention provided to the participants was a lunge jump training program, conducted in a systematic and structured manner. To ensure treatment homogeneity, the training program was conducted over a specific period with consistent intensity and frequency. This lunge jump training intervention was administered over a 2-month period, with a frequency of 2 sessions per week. Researchers and coaches supervised all athletes as they followed the same training routine. The primary instrument used in this study was a test measuring the distance of the back kick, recorded in centimeters. Two measurements were taken: one before the training intervention (pre-test) and one after the completion of the training program. The back kick distance test was used to assess kicking technique and the explosive strength of the leg muscles or lower extremities.

In addition to using testing instruments to measure kicking distance, this study utilized the Kinovea software as a measurement tool for motion analysis. Kinovea is a two-dimensional video analysis application used in sports science to study the dynamics of human body movement. During the testing phase, each athlete undergoing the test was recorded using a camera. The recor-

ded footage was then processed using Kinovea to measure backward kicking skills, which encompassed three phases: preparation; push-off and leg swing duration; and follow-through, as well as to measure knee and hip angles, supporting leg stability, and the leg trajectory used for kicking. The results of this motion analysis are used as qualitative data to complement the measured data on backward kick distance and will later provide insights into performance improvements following the lunge jump exercise.

To minimize potential measurement bias, data collection was conducted systematically and consistently for each study participant. Data collected during the pre-test and post-test were analyzed systematically. The data analysis tests used in this study included the following prerequisite tests: a normality test using the Shapiro-Wilk test and a homogeneity test using the Levene test, as well as a hypothesis test using the paired t-test.

RESULTS AND DISCUSSION

This study aims to analyze the impact of lunge jump training on the back kick skills of kabaddi athletes in Central Java in 2025. Back kick skills were evaluated using the Back Kick Distance (BKD) metric, measured in centimeters (cm), which reflects both technical kicking ability and the explosive strength of the lower leg muscles. The data were then analyzed using inferential statistical tests. Descriptive statistics for back kick distance are presented in **Table 1**.

Table 1. Descriptive Statistics of Back Kick Distance

Variable	N	Mean (cm)	Std. Deviation
Pre-Test	30	72.45	4.22
Post-Test	30	79.20	5.08

Referring to **Table 1** regarding the descriptive statistical data on the results of backward kick measurements before and after the lunge jump training program, it was found that the average backward kick distance of the players during the pre-test was 72.45 cm and increased after the training program, with an average result of 79.20 cm during the post-test. These results indicate that the training program improved the athletes' backward kick performance. The relatively small standard deviation suggests that each athlete achieved consistent results, indicating that the training program had a similar effect on all athletes. To ensure the parametric statistical analysis met the necessary conditions, prerequisite tests were conducted, including tests for normality and

homogeneity. The results of the prerequisite tests are presented sequentially in **Table 2** and **Table 3**.

Table 2. Normality Test Results

Variable	Test	Statistic	df	Sig.
Pre-Test	Shapiro-Wilk	0.972	30	0.600
Post-Test	Shapiro-Wilk	0.974	30	0.664

Referring to **Table 2** on the results of the data normality test, it is evident that both the pre-test data (Sig. = 0.600) and the post-test data (Sig. = 0.664) have significance values greater than 0.05. These test results indicate that the measurement data from each test phase are normally distributed, suggesting that the assessment results are consistent and show no outliers. This result fulfills one of the data prerequisite tests.

Table 3. Homogeneity Test Results

Test Basis	Levene Statistic	df1	df2	Sig.
Based on Mean	1.142	1	58	0.290
Based on Median	1.140	1	58	0.290
Based on Median (Adjusted df)	1.140	1	56.768	0.290
Based on Trimmed Mean	1.141	1	58	0.290

Referring to **Table 3** regarding the results of the data homogeneity test, it is found that the overall data significance value (Sig. = 0.290) is > 0.05. This result indicates that the data in this study is homogeneous. This result demonstrates consistency in the data obtained from each measured subject, with no influence from data variability, but rather fully attributable to the exercise program intervention. The results of this test indicate that the study has met the initial requirements for subsequent statistical data analysis. The results of the descriptive statistical tests for the pre-test and post-test data are presented in **Table 4**.

Table 4. Descriptive Statistics of Pre-Test and Post-Test

Variable	Mean (cm)	N	Std. Deviation	Std. Error Mean
Pre-Test	72.45	30	4.22	0.77
Post-Test	79.20	30	5.08	0.93

Based on **Table 4** above, it is evident that there was an increase in the average distance of the backward kick, with an average of 72.45 cm in the pre-test and 79.20 cm in the post-test. This increase of 6.74 cm indicates an improvement in

performance associated with the lunge jump training program. Next, the data regarding the correlation test between the lunge jump training and the backward kick are presented in **Table 5**.

Table 5. Paired Sample Correlation

N	Correlation	Sig.
30	0.947	0.000

Referring to **Table 5** on the results of the Paired Sample Correlation test, the correlation coefficient is 0.947, and the significance level (Sig. = 0.000) is < 0.05 . These results indicate that there is a relationship between the lunge jump training program and the athletes' backward kick measurements. The results of the Paired Sample T-Test are presented in **Table 6**.

Table 6. Paired Sample t-Test Results

Paired Differences	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Pre-Test – Post-Test	-6.744	1.733	0.316	-21.313	29	0.000

Referring to **Table 6** on the results of the Paired Sample T-Test, the results show a t-value of -21.313 with a significance level of $p = 0.000$ ($p < 0.05$). The results of this analysis indicate that there is a significant effect of the lunge jump training program on improving performance and back kick skills, as evidenced by the increase in the subjects' average scores between the pre-test and post-test.

The findings of this study indicate that lunge jump training is capable of enhancing the ability and technical skills of the back kick among kabaddi athletes in Central Java. The results of the statistical data analysis indicate a significant improvement. The lunge jump is a type of exercise that emphasizes and focuses on the stretch-shortening cycle (SSC) or rapid transition from eccentric to concentric muscle contraction, thereby triggering and stimulating the lower leg muscles to generate substantial explosive force within a brief timeframe. According to Hammami et al. (2019) plyometric exercises are a type of training capable of supporting neuromuscular system efficiency, motor unit activation, and lower limb muscle coordination, all of which are necessary for generating explosive movements in sports.

The increase in the average backward kick distance from 72.45 cm to 79.20 cm indicates that the lunge jump training program has an impact

on the lower extremity muscles, particularly the quadriceps, hamstrings, gluteus maximus, and other muscles responsible for lower limb stability. This is because these muscles play a key role in generating movement, maintaining balance, and managing body posture during backward kicks in kabaddi.

Beyond lower-body muscle strength, the back kick also relies on balance and coordinated body alignment to produce a more effective kicking technique. When a player or athlete performs this technique, one leg must maintain balance while the other generates power. The lunge jump exercise is also one of the exercises used to improve stability and dynamic balance of the lower extremities, to support better kicking accuracy and efficiency. Research by Ilham et al. (2024) explains that lunge-based plyometrics significantly improve lower-body stability, balance, and joint coordination.

The findings of this study align with previous research. Gunasekar and Balamurugan (2021) noted in their study that plyometric exercises significantly increased explosive strength in the legs of kabaddi players, which in turn led to better performance in matches. Research by Mallikarjunayya (2018) found that plyometric exercises can improve players' ability to jump and the efficiency of their kicks. Although this study focused on the lunge jump exercise, its findings provide new support for explaining the benefits of plyometric training in the sport of kabaddi. The results of this study indicate that a well-designed training program leads to the achievement of the desired training objectives in terms of effectiveness and significance. The lunge jump training program in this study emphasizes that although this exercise is relatively easy to perform, inexpensive, and requires no special equipment, when implemented and applied systematically, programmatically, progressively, and consistently, it becomes a key factor in enhancing physical components to support on-field performance.

This study indicates that plyometric exercises, specifically the lunge jump, are a recommended method for enhancing lower-body muscle strength in kabaddi players, particularly for athletes or players aiming to improve their kicking ability. However, a limitation of this study is that it focuses only on one type of plyometric exercise, so there is no discussion to compare it with other plyometric training methods. Additionally, the criteria used in the tests in this study did not include external factors such as athlete motivation, fatigue levels, and others.

CONCLUSION

Based on the results of the analysis and discussion, it was concluded that the lunge jump exercise influences the back kick technique of kabaddi athletes in Central Java. This study indicates that the lunge jump exercise, as a type of plyometric exercise, not only influences the improvement of lower limb muscle strength but also influences the improvement of the back kick technique of kabaddi athletes, which involves the lower extremities. As for suggestions for future research, other types of plyometric exercises could be included as a comparison in analyzing their influence and/or correlation with the back kick ability and performance of kabaddi players, or by adding variables in the form of external factors affecting the athletes, such as psychological condition, fatigue, and others.

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