

Comparison of Body Composition between Raiders and Defenders in Kabaddi: Muscle Mass and Fat Percentage

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Abstract

Kabaddi is a complex game with high intensity, where each player must have good aerobic and anaerobic capacity. Considering the playing position, body composition needs to be taken into account, because ideal body composition is a determining factor in an athlete's performance. This study aims to determine the body composition of kabaddi players and compare the characteristics of muscle mass (kg) and fat percentage (%) between raiders and defenders. This study uses a comparative quantitative method with a sample size of 19 kabaddi athletes from East Java. Body composition measurements were taken using InBody H20, which measures muscle mass and fat percentage. Data analysis was performed using the t-test with the help of SPSS software. The results of this study showed that there was no significant difference in muscle mass between raiders and defenders ($p=0.223$), and there was no significant difference in fat percentage ($p=0.930$). The conclusion is that even though the raider and defender positions have different roles, the balance between muscle mass and body fat percentage is one of the factors that supports optimal performance. Due to the complementary and dynamic playing patterns in kabaddi, athletes from both positions have almost equivalent physical requirements, which leads to similar body compositions.

Keywords: kabaddi, body composition, muscle mass, fat percentage

INTRODUCTION

Kabaddi is a game that originated in South Asia, more specifically in India, and then spread to various countries such as Bangladesh and Nepal (Jumareng et al., 2023). In kabaddi, there are two positions: raider and defender. Each position has a different role. The raider's role is to attack by touching the opponent and returning without being caught. Meanwhile, the defender's role is to stop the raider

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by catching or blocking them. Given that the playing positions in kabaddi have different roles, the physical condition and body composition of the players also differ. In their research Kardiyanto & Wijanarko (2021) stated that one of the factors supporting athletic performance is the need for a specific biological profile. In addition to biological profile, body composition is also very important to consider, because ideal body composition is a determining factor in athletic performance, success, and health (Toselli, 2021).

Body composition, which includes muscle mass and fat percentage, plays an important role in athletic performance. Rueda-Cordoba et al (2025) explained in their research that athletes who rely on strength have greater muscle mass than athletes who require endurance. An athlete with higher muscle mass is associated with increased strength and explosive power. (Milošević et al., 2024 ; Nakai et al., 2024). This shows why it is important for a kabaddi athlete to have muscle mass. In addition, a study by Mathisen et al (2023) found that higher body fat levels are negatively associated with endurance performance, while increased muscle mass results in performance benefits across all sports. Thus, athletes with higher muscle mass tend to have better strength, speed, and explosive power, while higher fat percentages reduce movement efficiency, especially in high-intensity sports.

Kabaddi is a complex and high-intensity game, where each player must have good aerobic and anaerobic capacity. This is because in this game, the raider and defender positions require good physical condition, such as short sprints, agility, explosive power, and strength to catch and jump. Kabaddi players must have these physical conditions to support optimal performance when playing. The study by Pramanick et al (2022) shows that muscle strength and leg explosive power are important components in kabaddi, although the study found no significant differences between kabaddi players and track and field athletes in shoulder strength and explosive power. The results of this study emphasize the importance of developing muscle strength to support optimal athletic performance.

Previous studies focusing on female kabaddi athletes have shown that differences in playing positions do not significantly affect body composition. This limitation indicates an urgent need to expand the scope of research to include male athletes and mixed samples in order to gain a more comprehensive understanding.

This study aims to analyze and compare body composition, particularly muscle mass and fat percentage, between kabaddi athletes in the raider and defender positions without gender restrictions. The results of this study are expected to contribute scientifically to the development of sports science, particularly in understanding differences in physical profiles based on playing positions that can be utilized to optimize training programs, performance improvement strategies, and sustainable athlete development.

METHODS

Research Design

The type of research used is quantitative comparative research. The comparative method is a research method that compares one object with another, whether it be figures, institutions, management, schools of thought, or relevant variables, with the aim of finding similarities and differences based on a specific framework of thought (Zayu et al., 2023). The research design used was a cross-sectional study. A cross-sectional design is a study to examine the dynamics of the correlation between risk factors and effects through an observational approach or simultaneous data collection at a specific point in time (point time approach), so that each research subject is only observed once, and measurements are taken of the status of the variables at that point in time (Herdiani, 2021). This comparative study aims to compare two groups, namely raider and defender athletes in kabaddi. The comparison is based on body composition, including muscle mass and body fat percentage. A cross-sectional design was chosen because it allows data collection at a single point in time to obtain a clear picture of the differences in body composition between the two groups of athletes.

Participants

The population and subjects of this study were 24 kabaddi athletes from East Java. The sampling technique used in this study was purposive sampling, with the criteria that the samples were kabaddi athletes who actively played as raiders or defenders. From a total population of 24 athletes (12 male and 12 female), the researcher only obtained 19 athletes who met the criteria and were willing to be respondents. The following are some of the inclusion criteria: kabaddi athletes who

are registered as active players in the team, athletes who occupy the positions of raider and/or defender, athletes who have participated in systematic training for the last 3 months, athletes who are willing to be respondents by filling out an informed consent form.

Data Collection

Data collection was performed using InBody H20, a device for measuring body composition based on Bioelectrical Impedance Analysis (BIA) technology. Body composition measurements only included muscle mass (kg) and fat percentage (%). Height measurements were taken using a stature meter.

Data Analysis

Data analysis was performed using SPSS, statistical software used to process quantitative data. Several analyses were performed, including descriptive tests to calculate the mean of each variable. Next, a normality test was performed using the Shapiro-Wilk test to check whether the data was normally distributed. Finally, a t-test was used to check for significant differences in body composition between the two groups of athletes (raiders and defenders).

RESULTS

Table 1. Descriptive Test Results

Position	Value	Height (cm)	Weight (kg)	Body Fat (%)	Muscle (kg)
Raider	mean	167,20	70,53	22,03	26,09
	minimum	161	53,75	10,59	19,02
	maximum	172	81,55	35,90	30,74
	n	10	10	10	10
Defender	mean	171,44	74,12	21,74	28,48
	minimum	157	61,55	12,57	18,66
	maximum	182	86,35	32,68	33,11
	n	9	9	9	9

Table 1 shows the results of descriptive analysis of the body composition of kabaddi athletes based on position, namely raider and defender. The average height of raider athletes is 167.20 cm, while defender athletes have an average of 171.44 cm. The average weight of raider athletes is 70.53 kg, while defender athletes are slightly heavier with an average of 74.12 kg. In terms of body fat percentage, raider athletes have an average of 22.24%, which is higher than defender athletes, who

have an average of 21.74%. In terms of muscle mass, there is a slight difference, with an average of 26.09 kg for raiders and 28.48 kg for defenders.

Table 2. Normality Test For Subject Characteristic

Variable	Position	Shapiro-Wilk		
		Statistic	df	Sig.
Height (cm)	Raider	,865	10	,089
	Defender	,926	9	,441
Weight (kg)	Raider	,931	10	,460
	Defender	,955	9	,748
Body Fat (%)	Raider	,917	10	,330
	Defender	,981	9	,971
Muscle Mass (kg)	Raider	,926	10	,413
	Defender	,846	9	,068

Table 2 shows that all variables, namely height, weight, fat percentage, and muscle mass in both groups (raiders and defenders) are normally distributed because the p-value is > 0.05 .

Table 3. Muscle Mass Comparison Test Results

Position	t-test for Equality of Means		
	Mean	Std. Deviation	Sig. (2-tailed)
Raider	26,0920	3,92443	0,223
Defender	28,4856	4,32763	

Table 3 shows that the average muscle mass of raider players is 26.0920 and the average for defenders is 28.4856. The significance value for both is 0.223.

Table 4. Results of Fat Percentage Comparison Test

Position	t-test for Equality of Means		
	Mean	Std. Deviation	Sig. (2-tailed)
Raider	22,0360	7,57718	0,930
Defender	21,7478	6,31498	

In Table 4, the average fat percentage for raiders is 22.0360 and the average for defenders is 21.7478. The significance value for both is 0.930.

DISCUSSION

This study aims to analyze the comparison of the body composition of kabaddi athletes based on their playing positions, namely raider and defender. The variables tested include height, weight, fat percentage, and muscle mass. There

were a total of 19 athletes consisting of players who played as raiders and defenders. Descriptively, defender players tend to be taller (average 171.44 cm) and heavier (average 74.12 kg) than raider players (height 167.20 cm; weight 70.53 kg). The body fat percentage of both groups was relatively similar (raiders 22.03%; defenders 21.74%), while the average muscle mass of defenders (28.48 kg) was slightly greater than that of attackers (26.09 kg). The Shapiro-Wilk normality test showed that all variables were normally distributed in both groups ($p > 0.05$), and the t-test showed no significant differences in body fat percentage ($p = 0.930$) or muscle mass ($p = 0.223$).

The percentage of fat in the raider and defender positions showed no significant difference ($p=0.930$), making the two positions relatively comparable. Several studies have shown that people with high percentages of fat are potentially at risk of health problems, even death (Mainous et al., 2025 ; Sedlmeier et al., 2021). In the context of high-intensity sports such as kabaddi, quick and explosive movements are definitely required (Deepa & Dhanaraj, 2024 ; Rathod & D, 2025). A high percentage of body fat can reduce movement efficiency, which leads to decreased performance. As mentioned by Stachoń et al (2023), fat mass is negatively correlated with running speed. This clarifies that the higher the fat content in a person or athlete, the lower their body movement efficiency (Di Lemme et al., 2024). In addition, Canli et al (2025) also found that a higher percentage of body fat had a negative effect on the total FMS (Functional Movement Screen) score, indicating a decrease in functional movement capacity. Conversely, factors such as height, weight, and BMI did not show a significant effect on the FMS score. These findings are consistent with Ishida et al (2021) which showed that increasing LBM (lean body mass) and BF% (body fat percentage) to optimal levels can be beneficial for jumping and sprinting performance, two important components in kabaddi.

When muscle mass is higher than the percentage of fat in the body, an athlete can move more efficiently and quickly. The results of this study show that there is no significant difference in the percentage of fat between raiders and defenders. In his research, Dhanjal (2025) found that fat mass was significantly lower in raiders ($p=0.015$) compared to defenders, which may be due to differences in movement

between the two playing positions. Martín-Rodríguez et al (2024) Emphasizing the importance of developing a nutrition strategy tailored to individual needs, especially for anaerobic sports such as kabaddi, which require fast and explosive movements. Proper nutrition can meet physiological needs and performance enhancement goals, thereby supporting speed and explosive power. This means that attention must be paid to maintaining fat percentage within normal limits. This is especially important for raider athletes, as it will affect their performance when maneuvering quickly to attack or touch the opposing team without being caught by the defender.

In addition to body fat percentage, the muscle mass results above for the raider and defender positions are not particularly significant ($p=0.223$), even though the average athlete in the defender position has slightly higher muscle mass than the raider. This shows that muscle mass is very important for improving the abilities of kabaddi athletes, especially for the defender position, which usually requires a larger body to defend in a role that involves a lot of physical contact. Meanwhile, the raider position tends to have lower muscle mass because they emphasize speed and agility to maneuver during attacks. The raider position prioritizes speed and agility, as raiders are required to move faster and maneuver effectively, which is very important in the attacking position in kabaddi. Ferrini et al (2025) and Nygaard Falch et al (2019) state that a combination of strength and plyometric training can improve body composition, agility, and speed. This is in line with the role of the raider position, which requires agility and speed to avoid and touch opponents by performing repeated short sprints. Defenders, on the other hand, need to have slightly more muscle mass than raiders in order to hold off attacking opponents and tackle them. Several studies also mention that greater muscle mass enables athletes to generate more power in explosive movements. (Schoenfeld et al., 2021).

In Roy & Sarkar (2022) study, which also compared the body composition of raiders and defenders, it was found that there were slight differences in muscle mass and body fat percentage, but these were not significant. This shows that raiders and defenders have different physical demands, and that the positions of raider and defender have dynamic playing patterns. This is because when a raider finishes attacking, they return to their position to defend. Similarly, when a raider leaves the

field, a defender will attack. Therefore, raiders and defenders must have higher muscle mass to improve performance in terms of agility, speed, and strength. However, a higher percentage of fat can reduce the efficiency of body movements, which lowers an athlete's performance.

CONCLUSION

Based on the above research, the results of the comparison of body composition between raiders and defenders are not significant in kabaddi, in terms of fat percentage and muscle mass. Although the positions of raider and defender have different roles, both positions require almost similar physical qualities, such as speed, strength, and endurance. Raiders focus more on speed and agility to maneuver quickly, while defenders prioritize strength and speed to catch raiders. The balance between muscle mass and body fat percentage is one of the factors that supports optimal performance. The complementary and dynamic playing patterns in kabaddi cause athletes from both positions to have almost equivalent physical requirements, which leads to similar body compositions. Thus, the differences between raider and defender athletes are more influenced by physical condition, technical, and game strategy factors. Based on these results, coaches can design appropriate training programs for each position, such as agility, speed, strength, and emphasizing the balance between muscle mass and body fat in athletes.

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