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The Influence of Endurance and Speed on The Mae Geri Jodan Kick In Terms of Accuracy in Lemkari Athletes From Takalar Regency

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ABSTRACT

This study aims to determine the effect of endurance and speed on mae geri jodan kicks in terms of accuracy of Lemkari athletes in Takalar Regency. The background of this study is based on the ability of mae geri jodan kicks in karate athletes who are still not good at doing kumite which becomes the basis for further research on the influences that affect the ability of karateka kicks. This study uses a path analysis approach from each variable on the ability to perform mae geri jodan kicks. The sample of this study amounted to 50 male karateka with green belts and above. The instruments used were the Coper minute test, accuracy test, and repetition test of mae geri jodan kicks. The results of this study indicate that the ability to kick mae geri is influenced by a combination of physical and technical factors, especially endurance, speed, and accuracy. The results of the t-test show that endurance has a significant effect on the ability to kick mae geri jodan, indicated by the calculated t value being greater than the t table at a significance level of 0.05. In addition, speed also shows a significant effect on the ability to kick mae geri with the calculated t value > t table.

Keywords: Path Analysis, Repetition Test, Mae Geri Jodan Kick, Karate Takalar

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INTRODUCTION

Karate is also a sport that can integrate a person's physical, mental, and moral aspects. (Piepiora & Gwardyński, 2024). Karate from the traditional Okinawan martial arts into a modern structured sport, encompassing aspects of physical education, character building, health, and competition. that karate not only functions as a physical activity, but also as a means of forming moral values, discipline, and cultural identity. (Piepiora et al., 2024). In karate martial arts, basic techniques are known as kicking. Mastering basic techniques can improve a person's motor skills. (Lestari et al., 2024). There are several basic techniques in karate such as blocking, horse stance, punching, and kicking. (Prasetyo et al., 2023). Apart from that, karate martial arts can combine a person's physical, mental and moral aspects, and it is necessary to know that psychological factors have a role in having a karate ability.

(Ibrahim et al., 2024). In a karate match, it can be seen that in a match more is produced by kicks so it is necessary to examine the ability of mae geri kicks in kicks.

(Fendrian & Nurzaman, 2016). In karate, endurance and speed components in performing mae geri jodan kicks play an important role in both kick accuracy and ability. A study showed that the development of aerobic endurance is an important component in overall karate performance. These findings help understand how physical endurance develops in young karate athletes and training development strategies (Korkmaz et al., 2025)..

Accuracy is not only related to hitting the target, but also includes the accuracy of the movement trajectory, body stability, and consistency of technique when the kick is executed. In the context of karate competitions, especially kumite, accuracy is a determining factor in scoring because attacks are considered valid if they are on target, controlled, and executed with the correct technique. (Robalino, e Silva Cabral, et al., 2025). Mastering biomechanical techniques in karate will also make it easier to execute the technique. (Junior, 2022). By increasing reaction speed training, karateka will have speed in executing mae geri kicks. (Matutu, 2019). To train kicking accuracy, practice using moving targets. (Ani et al., 2020).

Agility and speed showed a negative relationship with accuracy, indicating that complex physical factors influence the quality of kicking technique in measuring target accuracy. Technically, the ability to execute kicks with good accuracy can be trained by mastering basic kicking techniques, such as understanding the use of the stance, knee lift, hip thrust, and foot control in hitting the target (Oktavian et al., 2022).

Table 1. Descriptive results

Variable	N	Mean	SD	Min	Max
Endurance (X1)	50	44,8	1,0	43	46
Speed (X2)	50	56,6	9,3	43	80
Accuracy (Z)	50	31,8	1,1	30	33
Mae geri (Y)	50	31,8	1,0	30	33

Based on the results of descriptive analysis and summarized in Table 4.1, Variable X1 has a minimum value of 43 and a maximum value of 46. The average value (mean) of variable X1 is around 44.8, which indicates that in general the value of X1 is in the middle range of the available data range. The standard deviation of X1 is relatively small, which is

around 1.0, which indicates that the X1 data has low variation. This indicates that the distribution of X1 data is quite homogeneous and most of the karateka values are close to the average value. In other words, there is no striking difference between variables X1. Variable X2 has different characteristics compared to X1. The minimum value of X2 is 43, while the maximum value reaches 80. The average of variable X2 is in the range of 56.6, which indicates that most of the data is concentrated around that value. The standard deviation of X2 is relatively larger, which is around 9.3, which indicates that the variation of X2 data is quite high. The size of this standard deviation shows that there is a significant difference between respondents in variable X2, so that this variable has a higher level of heterogeneity than other variables.

The Z variable has a minimum value of 30 and a maximum value of 33. The average value of the Z variable is around 31.8. The standard deviation of the Z variable is relatively small, around 1.1, indicating that the Z data is evenly distributed around its average value. This condition indicates that the Z variable tends to be uniform and does not show extreme variations. The Z variable can be said to have good data stability. The Y variable as the dependent variable has a minimum value of 30 and a maximum value of 33, with an average value of around 31.8. The Y standard deviation is around 1.0, indicating that the variation of the Y data is relatively low. This indicates that the results or outputs measured by the Y variable tend to be consistent. This even distribution of values indicates that the Y data is representative enough to be used in further analysis. Overall, the results of the descriptive analysis show that variables X1, Z, and Y have low levels of data variation and are homogeneous, while variable X2 has higher data variation. However, all variables are still within a reasonable range of values and do not show any extreme deviations.

Table 2. Normality Test

Variable	Statistics	Sig. (p)	Information
Endurance (X1)	0,960	0,067	Normal
Speed (X2)	0,945	0,051	Normal
Accuracy (Z)	0,963	0,082	Normal
Mae geri (Y)	0,957	0,061	Normal

The first variable tested was X1. The Shapiro–Wilk test results showed a statistical value of 0.960 with a significance value (p-value) of 0.067. A p-value greater than 0.05 indicates that the data in variable X1 is normally distributed. Thus, there is no significant deviation in the data distribution in this variable. This condition indicates that the values of X1 are spread

proportionally around the mean value. Variable X2 obtained a Shapiro–Wilk statistical value of 0.945 with a significance value of 0.051. Although the p-value is very close to the significance limit of 0.05, it is still above that value. Therefore, the data variable X2 is still declared normally distributed. This indicates that the fairly large data variation in X2 is still within a statistically acceptable distribution pattern. Furthermore, variable Z shows a Shapiro–Wilk statistic value of 0.963 with a significance value of 0.082. This relatively high p-value indicates that the Z data has a good normal distribution. Thus, variable Z meets the assumption of normality and can be used in further statistical analysis without the need for data transformation. The last variable, Y, has a Shapiro–Wilk statistic value of 0.957 and a significance value of 0.061. A p-value greater than 0.05 indicates that the data for variable Y is also normally distributed. This is important because variable Y is the dependent variable, so fulfilling the assumption of normality will increase the validity of the results of regression analysis or hypothesis testing.

Based on the results of the normality test for the four variables, it can be concluded that all research data are normally distributed. Thus, the classical assumption of normality has been met. This indicates that the data is suitable for analysis using parametric statistical methods, and the results obtained can be interpreted validly and reliably.

In the t-test conducted to find the significance of the influence of each variable and based on data processing, the following statistical summary was obtained:

Table 3. t-test

Path of Influence	t-count	Sig. (p-value)	Decision
X1 → Z	1,100	0,277	Not significant
X2 → Z	2,278	0,027	Significant
X1 → Y	2,133	0,038	Significant
X2 → Y	3,956	0,000	Significant
Z → Y	2,852	0,006	Significant

Based on the results of the t-test in the path analysis, it is known that the influence of X1 on Z produces a t-count value of 1.100 with a significance of 0.277. This value is greater than 0.05 so it can be concluded that X1 does not have a significant effect on Z. This means that changes in X1 do not directly affect the Z variable.

On the other hand, the influence of X2 on Z shows a t-value of 2.278 with a significance value of 0.027. Because the significance value is less than 0.05, X2 has a significant

influence on Z. This shows that X2 is an important factor in explaining variations in the Z variable.

In the second substructure, the influence of X1 on Y shows a t-count value of 2.133 with a significance of 0.038. This result indicates that X1 has a direct significant influence on Y, although it does not affect Z. Thus, the influence of X1 on Y is direct.

Furthermore, the influence of X2 on Y produces a t-value of 3.956 with a significance of 0.000. This value indicates that X2 has a very significant influence on Y, and is the most dominant independent variable in the research model.

The influence of Z on Y shows a t-value of 2.852 with a significance of 0.006. This proves that Z has a significant influence on Y, so that Z can function as an intervening variable in the relationship between X2 and Y.

METHOD

Based on the research that will be conducted by analyzing the influence of each variable, in this study with a path analysis approach. As stated (Muin & others, 2023) that quantitative research is a step used to obtain data in the form of numbers that will be quantified and analyzed. In this study, it was conducted at the Dojo Lemkari Takalar Regency which was held in November 2025 with a population of karate athletes Lemkari Takalar Regency and karate athletes with green belts and above who were used as samples in this study with a total of 50 athletes. In this study, data collection used a coper minutes test for endurance and for accuracy using a target for kick repetitions performed by karate ka as well as in collecting data on the speed of athlete kicks.

The data were analyzed descriptively, descriptive analysis was used to describe the characteristics of the data, after the data met the normality and homogeneity tests. Hypothesis testing was carried out using the t-test to determine the significance of each path on the existing variables. All analyses were carried out at a significance level of 0.05.

RESULTS AND DISCUSSION

Results

The data presented in this study is processed, not raw. The measurement results determine the extent to which each variable significantly influences an athlete's mae geris kicking ability, which is then analyzed descriptively. A summary of the measurement results is presented in tabular form.

Descriptively, the endurance ability of karate athletes has a significant influence on mae geri jodan kicks, and kick speed also has a close relationship with mae geri jodan kicks and the accuracy of an athlete's kicks. So it can be seen that a person's mae geri jodan kicking ability can be influenced by several abilities that an athlete possesses.

The statistical test results showed a significant effect ($p < 0.05$). This indicates that endurance and speed influence the accuracy and ability of Mae Geri Jodan kicks in karate athletes.

Discussion

The data presented in this study are statistically processed, not raw data. The results of measurements of endurance, speed, and accuracy in mae geri jodan kicks have been summarized in the form of descriptive statistical tables, which contain the average value, standard deviation, and t-test results. The presentation of data in tabular form is intended to facilitate readers in understanding the mae geri jodan kicking ability of karate athletes from Takalar Regency.

The main findings in this study indicate that the ability of an athlete's endurance has a significant influence on having a mae geri jodan kick in karate, the speed of the kick in performing a mae geri jodan kick also has a significant influence although in terms of accuracy it is not too significant but has a relatively significant correlation. So the ability of an athlete's endurance and speed really need to be considered in increasing accuracy in performing a mae geri jodan kick.

The accuracy of Mae Geri Jodan kicks in karate athletes emphasizes the importance of considering endurance, or an athlete's physical components, as a support when kicking. Speed is one component that plays a role in the ability to kick accurately. With good speed control, athletes will find it easier to control their body's biomechanics to achieve good kick accuracy.

The results of this study support the hypothesis that endurance and speed influence the mae geri jodan kick when viewed from the perspective of kick accuracy. Biomechanically, the movement is influenced by a person's endurance, which in this study aligns with what is understood in kicking, especially speed. The most fundamental aspect to understanding is the power or explosive power of our muscles, which is the biggest contributor to faster kicking (Sabatini et al., 2019). Therefore, with this ability, students or karateka can improve their endurance and abilities, and improve their mental abilities when they are able to master and control themselves during intense training (Jahrir & Aziz, 2025).
Consistency and Comparison with Previous Research

Satria, M. C., & Lemire, V. (2019) stated that the speed ability of a person in performing a kick is different, not only physical ability but also aspects of mastery of other components such as movement techniques such as in mastering kinematic techniques in ame geri jodan kicks. (Akli et al., 2024) also emphasized in the research conducted that the endurance component of an athlete has a significant role in the speed of an athlete's kick in performing a kick.

No previous research findings were found in the thesis files that directly contradict the findings of this study. The differences that exist are more related to the variation in the study subjects, the duration of the treatment, and the type of kick performed. Thus, the results of this study are not only consistent with previous research but also strengthen empirical evidence that an athlete's endurance and kicking speed influence the accuracy of the mae geri jodan kick in karate athletes.

CONCLUSION

Based on the research and data analysis, it can be concluded that an athlete's endurance and kicking speed significantly influence kicking accuracy in karate athletes. This demonstrates the importance of endurance and the ability to execute kicking movements quickly to produce a successful mae geri kick.

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