

## The Review of Physical Condition Components with Kansetsu Geri Abilities in Karateka

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### ABSTRACT

This research is descriptive research that aims to determine the relationship between the results of the analysis of leg explosive power, dynamic balance, and leg split flexibility to the ability of kansetsu Geri against karateka gojukai. The population of this study was Gojukai Soppeng karate athletes with a sample of 30 karatekas. The research variables consist of independent variables, namely leg explosive power, dynamic balance, and leg split flexibility. While the dependent variable is the ability of kansetsu Geri against the Gojukai karateka. Based on the results of data analysis, it can be concluded that: (1) There is a relationship between the components of physical condition in terms of the explosive power of the legs with the ability of kansetsu Geri in karateka, with a value of 30.3%. (2) There is a relationship between the physical condition component in terms of dynamic balance and the ability of kansetsu Geri in karateka, with a value of 26%. (3) There is a relationship between the physical condition component in terms of leg split flexibility and kansetsu Geri's ability in karateka, with a value of 31.5%. And (4) There is a relationship between the components of physical condition in terms of leg explosive power, dynamic balance, and leg split flexibility with the ability of kansetsu Geri in karateka, with a value of 51.9%.

**Keyword:** Physical Condition; Kick; Kansetsu Geri; Karate

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### INTRODUCTION

Sports achievements are not an easy thing. However, achievement sports activities are very complicated and require various efforts to improve achievement (Sahabuddin, 2019). To realize a dream of achieving good achievements, any activities carried out must be

supported and in line with the development of science and technology (Muharyoko, 2014). Where science and technology can support and help to accelerate the achievement of increased sports achievement (Pambudi, 2015). The fact that we see that sports have been used as a benchmark for the high and low culture of a nation is one indicator of the success of a nation or region that builds itself (Rizki et al., 2021). Apart from that, what is even clearer is the place of sport in the overall national development plan which in essence is to create a whole Indonesian person (Hidayat et al., 2020).

Increasing sports achievement is very important and quite complex, various factors also determine the many problems that can occur in coaching athlete performance (Sahabuddin, 2017). However, the development of science and technology today contributes to answering these various problems (Wicaksono & Supriyono, 2021). Various problems in improving achievement should be solved through a scientific approach, namely by conducting research. The world of sports requires a variety of calculations and analyses of human movements that are very complex (Mislaha Elmi, Purnomo, 2021). However, some sports still focus on the problem of ways and techniques to improve the performance of athletes, therefore the problem of improving the performance of a sport is a very serious thing to solve (Ihsan et al., 2022).

Several sports have fostered and developed achievements in Indonesia, especially in South Sulawesi, one of which is karate. Karate is one of the martial arts sports that is quite popular and loved by all circles, among children, teenagers, adults, and even the elderly, both men and women. Especially in the Soppeng district, karate martial arts has been known by the surrounding community, this can be seen from the many karate training units in the Soppeng district, especially schools that have made karate their extracurricular. One of the efforts to revive karate martial arts is by socializing karate martial arts in schools. Some schools have recorded achievements in the field of karate at the regional, district, provincial, and even national levels.

Each sport has its basic techniques, as well as karate martial arts sports have their basic techniques (Fadli, 2014). One of the factors that determine the achievement of achievements in karate martial arts is leg explosive power, dynamic balance, and leg split flexibility which are aspects that greatly influence improving skills (Sari, 2020). Karate is a sport in which the form of movement activities using feet, hands or even other legs that are worn (Simbolon & Siahaan, 2020). Karate has body movements such as jumping, maintaining balance, forward, and backward, and moving left / right (Fanani & Kusmaharti, 2014). Karate techniques that are well-trained and controlled according to one's wishes (Karate-ka) (Sasmita et al., 2022) By spontaneously moving directly to the right and powerful target (Suganda et al., 2016). Karate just like other martial arts sports has movements that involve elements of physical strength and technique (Manullang, 2019). These elements support each other. Without inadequate physical strength, techniques will be difficult to develop, and vice versa without techniques physical abilities will be wasted (Bagia, 2016). In karate martial arts many movements involve very influential physical elements, namely: parrying, hitting, kicking, and attacking (Cakrawijaya, 2021). All of them involve elements of strength, explosive power, speed, balance, and flexibility. However, in this study, the technique in question is the kick technique. Kick techniques in karate are divided into several kick techniques including mawashi geri, mae geri, usiro geri, and kansetsu geri kicks (Ahmad Yanuar Syauki et al., 2021). But the kick referred to in this study is a kansetsu geri kick or a breaking kick (Ancient, 2016). In karate, what needs to be considered when kicking is speed and accuracy (Aribowo & Alnedrat, 2018). This is important because the faster the kick hits the right target will knock out the opponent (Diagusta & Priambodo, 2019),



and Kansetsu Geri's kick is one of those kicks that can knock out opponents quickly (Primary, 2016). Kansetsu Geri kick or breaking kick is a blow from the side with the side of the foot in a crooked position with the target knee (Oktasari et al., 2018). When doing kansetsu Geri kicks or other kicks that need to be considered are the explosive power of the legs, dynamic balance, and the flexibility of one's leg split when doing kansetsu Geri kicks (Purba, 2017). Because that's what greatly affects a person's kansetsu Geri kick so that it hits the right target (Sari, 2020).

The implementation of kansetsu Geri kicks must be careful in their implementation, both in seeing the target position and the right time to kick (Alhinduan et al., 2018). From the facts seen, it shows that there are imperfections in doing kansetsu Geri kicks which are considered not optimal so in carrying out kansetsu Geri kick attacks, you must pay attention to the explosive power of the legs, dynamic balance, and flex of the split legs (Wanda et al., 2018). Factors that are suspected to be one of the causes of the lack of maximum kansetsu Geri kicks are the lack of leg split training, leg explosive power, and balance training or knowledge about doing kansetsu Geri kicks.

## **METHODS**

The method used in this study is the descriptive method. There are two variables involved, namely the dependent variable, namely the Kansetsu Geri kick, and the independent variable, namely the physical condition component (leg explosive power, dynamic balance, and leg split flexibility). This research is a type of correlational descriptive research that aims to determine whether or not there is an analysis of leg explosive power, leg split flexibility, and dynamic balance, related to the ability of Kansetsu Geri in karateka. The population in this study is as many as the Gojukai karateka of Soppeng Regency which amounts to 30 people. Based on the above understanding, the samples taken or used in this study amounted to 30 Gojukai karateka using saturated samples. Data collection techniques are a way of collecting data needed to answer research problem formulations. Data collection is carried out using test items corresponding to the dependent variables. Data collection procedures are carefully structured and carried out using appropriate instruments. This is important so that the variables measured can be obtained more accurately and reliably. Data collection is also carried out systematically and planned following the flexibility of the collection technique of the type of test used. Regarding the variables studied, the instrument used in this study is to determine the physical condition, especially regarding the problem of leg split flexibility, leg explosive power, and dynamic balance of the ability of Kansetsu Geri in karateka. The data to be collected in the study following the variables involved, namely leg split flexibility, leg explosive power, and dynamic balance of Kansetsu Geri's abilities in karateka.

Each study has data on research results, and the data obtained will be accumulated together. In this study, the data obtained were in the form of leg explosive test scores, balance, flexibility, and Kansetsu Geri abilities in karateka. The collected data needs to be analyzed statistically, descriptively, or inferentially to test research hypotheses. The description used in this study is as follows: (1) descriptive data analysis is intended to get a general picture of the data which includes total values, range, average, standard deviation, minimum value, and maximum value. And (2) inferential analysis is used to test research hypotheses using correlation and regression tests.

## RESULTS AND DISCUSSION

### Result

All results of the descriptive analysis of data for each variable can be seen in the appendix and the results are summarized in the table as follows:

**Table 1.**

Results of descriptive analysis of research variable data

		<b>Leg Explosive Power (x1)</b>	<b>Dynamic Balance (x2)</b>	<b>Leg Split Flex (x3)</b>	<b>Kansetsu Geri (y)</b>
N	Valid	30	30	30	30
	Missing	0	0	0	0
Mean		211.3333	82.9000	9.5333	14.2333
Std. Error of Mean		2.99629	1.30018	.99045	.53538
Median		211.0000	83.5000	9.5000	15.0000
Mode		188.00a	88.00	5.00	16.00
Std. Deviation		16.41138	7.12136	5.42493	2.93238
Variance		269.333	50.714	29.430	8.599
Range		69.00	31.00	19.00	11.00
Minimum		179.00	69.00	1.00	8.00
Maximum		248.00	100.00	20.00	19.00
Sum		6340.00	2487.00	286.00	427.00

Based on **Table 1** above, is a summary of the results of the descriptive analysis of leg explosive power, balance, flexibility, and kansetsu Geri's ability. Furthermore, it can be anointed as follows:

### **Descriptive analysis of leg explosive power score (X1)**

Based on research data on the variable explosive power of the legs (X1), the mean is 211.33, the median is 211.00, the mode is 188.00, the standard deviation is 16,411 points, the variance is 269.33 points, the range is 14.00 points, the minimum value is 179.00 points, and the maximum value is 248.00 points.

### **Descriptive analysis of dynamic balance score (X2)**

Based on research data on dynamic equilibrium variables (X2), the mean is 82.90, the median is 85.50, the mode is 88.00, the standard deviation is 7.12 points, the variance is 50.71 points, the range is 31.00 points, the minimum value is 69.00 points, and the maximum value is 100.00 points.

### **Descriptive analysis of leg split flex score (X3)**

Based on the data from the results of the study on the variable leg split flex (X3), the mean is 9.53, the median is 9.50, the mode is 5.00, the standard deviation is 5.42 points, the variance is 29.43 points, the range is 19.00 points, the minimum value is 1.00 points, and the maximum value is 20.00 points.

### **Descriptive analysis of kansetsu Geri ability score (Y)**

Based on research data on the kansetsu geri (Y) ability variable, the mean is 14.23, the median is 15.00, the mode is 16.00, the standard deviation is 2,932 points, the variance is 8.59 points, the range is 11.00 points, the minimum value is 8.00 points, and the maximum value is 19.00 points.

## Data Normality Testing

The technique of testing the normality of data for each variable in this study is by using the normality test analysis method from Kolmogorov-Smirnov. The results of the data normality test are contained in the appendix of this study, and a summary of the test results is listed in Table 2 here:

**Table 2.**  
 Kolmogorov Smirnov normality test results

		Leg Explosive Power (x1)	Dynamic Balance (x2)	Leg Split Flex (x3)	Kansetsu Geri kick (y)
N		30	30	30	30
Normal Parameters	Mean	211.3333	82.9000	9.5333	14.2333
	Std. Deviation	16.41138	7.12136	5.42493	2.93238
Most Extreme Differences	Absolute	0.096	0.116	0.165	0.136
	Positive	0.088	0.093	0.165	0.077
	Negative	-0.096	-0.116	-0.095	-0.136
Kolmogorov-Smirnov Z		0.525	0.635	0.904	0.747
Asymp. Sig. (2-tailed)		0.946	0.815	0.388	0.632

Based on Table 2 above, the data shows that from the results of data normality testing using the Kolmogorov Smirnov test method, shows the following results:

1. For leg explosive power data (X1), KS-Z = 0.525 (P = 0.946 > α 0.05) is obtained, so it can be concluded that Karateka leg explosive power data is normally distributed data.
2. For Dynamic equilibrium data (X2), KS-Z = 0.809 (P = 0.815 > α 0.05) is obtained, so it can be concluded that Karateka dynamic equilibrium data is normally distributed data.
3. For leg split flexion data (X3), KS-Z = 0.904 (P = 0.971 > α 0.388) is obtained, so it can be concluded that karateka flex data is normally distributed data.
4. For Kansetsu Geri ability data (Y), KS-Z = 0.747 (P = 0.632 > α 0.05) is obtained, so it can be concluded that Kansetsu Geri karateka ability data is normally distributed data.

## Contribution Coefficient Analysis

To obtain the correlation coefficient value or contribution of the leg explosive power variable, balance, flexibility and ability of Kansetsu Geri, it is necessary to analyze the test result data from the measurement of these variables. The analysis is carried out both individually and simultaneously. The statistical tests used are parametric statistical tests, namely the correlation of product-moment from Pearson (r) and regression analysis.

## The relationship between the components of physical condition is seen from the explosive power of the legs with the ability of kansetsu Geri in karateka.

The second hypothesis tested in this study is "There is a relationship between the components of physical condition in terms of the explosive power of the legs with the ability of kansetsu Geri in karateka". Hypothetically, the statistic can be formulated as follows:

$$H_0 : X\beta_2 Y = 0$$

$$H_1 : X\beta_2 Y \neq 0$$

Based on the results of a simple linear regression analysis between pairs of leg explosive research data with the ability of kansetsu Geri in karateka produced a constant (a) of -0.6.564 and a regression direction coefficient (b) of 0.098. Thus, the relationship between the components of physical condition in terms of the explosive power of the legs

with the ability of kansetsu Geri in karateka obtained the regression equation  $Y = -0.6.564 + 0.098 X1$ . The results of the calculation of the significance and linearity test of the regression equation are presented in the ANAVA table as shown in the following table:

**Table 3.**  
 ANAVA Test of Significance and Linearity of Regression Y over X1  
 $Y = -0.6.564 + 0.098X1$

	Type	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	75.646	1	75.646	12.193	.002a
	Residuals	173.720	28	6.204		
	<b>Total</b>	<b>249.367</b>	<b>29</b>			

From the table above, for the regression linearity test of mawashi geri ability in Gojukai karateka (Y) on the leg explosive power variable (X1), obtained F-count (Tc) 0.129 with p-value = 0.002 > 0.05, this means Ho is accepted. Thus it can be concluded that the form of the regression equation  $Y = -0.6.564 + 0.098X1$  is linear. So it shows that the form of the regression equation  $Y = -0.6.564 + 0.098X1$  is significant.

The constant value of -0.6.564 in the regression equation above is a fixed value, which means that if the leg explosive power variable is 0, then the kansetsu Geri ability in karateka has a value of -0.6.564. Furthermore, a positive regression coefficient means that there is a directly proportional influence between the explosive power of the legs and the ability of kansetsu Geri on karateka. That is, every increase in one leg explosive power score will be followed by an increase in the kansetsu Geri ability score on karateka at a constant of -0.6.5564.

The amount of relationship between the explosive power of the legs and the ability of kansetsu Geri in karateka can be seen from the amount of the coefficient of determination obtained. A summary of the results of the calculation of the coefficient of determination and F test can be seen in the following table:

**Table 4.**

Test the significance of the coefficient of determination of leg explosive power with the kansetsu Geri ability in karateka.

Variable	Number of Observations	Coefficient of Determination	F-count	F table $\alpha=0.05$
Leg Explosive Power (X1) Kansetsu Geri Ability (Y)	30	0.303	16.656	6,90

The calculation of the significance test of the coefficient of determination is known to be F-count = 16.656 greater than F-table = 6.90 at  $\alpha=0.05$ . This result means that the coefficient of determination of leg explosive power with kansetsu Geri ability in karateka of 0.303 (30.3%) is significant meaning that the hypothesis that states there is a relationship between the analysis of physical condition components in terms of leg explosive power with the ability of kansetsu Geri in karateka is accepted. In other words, the greater the explosive power of the legs, the greater the kansetsu geri ability on karateka.

The coefficient of determination obtained for the relationship of leg explosive power with kansetsu Geri's ability in karateka is 0.303 (30.3%). Thus, the relationship between leg explosive power and kansetsu Geri's ability in karateka is 30.3%.

**The relationship between physical condition components is seen from dynamic balance with kansetsu Geri's abilities in karateka.**

The third hypothesis tested in this study is "there is a relationship between the components of physical condition in terms of dynamic balance with the ability of kansetsu Geri in karateka.

Based on the results of a simple linear regression analysis between pairs of dynamic balance research data with kansetsu Geri's ability in karateka resulted in a constant (a) of -5.167 and a regression direction coefficient (b) of 0.210. Thus, the relationship between the analysis of physical condition components in terms of dynamic balance with the ability of kansetsu Geri in karateka obtained regression equation  $Y = -5.167 + 0.210 X_2$ . The results of the calculation of the significance and linearity test of the regression equation are presented in the ANAVA table as shown in the following table:

**Table 5.**  
 ANAVA Test of Significance and Linearity of Regression Y over  
 $X_2 Y = -5.167 + 0.210 X_2$

	Type	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	64.796	1	64.796	9.830	.004a
	Residuals	184.571	28	6.592		
<b>Total</b>		<b>249.367</b>	<b>29</b>			

From the table above, for the regression linearity test of kansetsu Geri's ability on karateka (Y) over the dynamic equilibrium variable ( $X_2$ ), obtained F-count ( $T_c$ ) 9.830 with p-value = 0.004 > 0.05, this means  $H_0$  is accepted. Thus it can be concluded that the form of the regression equation  $Y = -5.167 + 0.210X_2$  is linear. While the regression significance test obtained an F-count value of 31.612, and p-value = 0.004 < 0.05 This means that  $H_0$  is rejected, thus showing that the form of the regression equation  $Y = -5.167 + 0.210X_2$  is significant.

The constant value of 5.167 in the regression equation above is a fixed value, which means that if the dynamic equilibrium is 0, then the kansetsu Geri ability in karateka has a value of 5.167. Furthermore, a positive regression coefficient means that there is a directly proportional relationship between dynamic balance and kansetsu Geri's ability in karateka. That is, every increase in one dynamic balance score will be followed by an increase in the kansetsu Geri ability score in karateka by 0.508 at a constant of 5.002.

The amount of dynamic balance with the ability of kansetsu Geri ability in karateka can be seen from the amount of the coefficient of determination obtained. A summary of the results of the calculation of the coefficient of determination and F test can be seen in the following table:

**Table 6.**  
 Test the significance of the dynamic equilibrium coefficient of determination with the kansetsu Geri ability in karateka.

Variable	Number of Observation s	Coefficient of Determination n	F-count	F table $\alpha = 0.05$
Dynamic Balance ( $X_2$ ) Kansetsu Geri Ability (Y)	30	0.260	17.765	5,70

The results of the significance test calculation of the coefficient of determination are known as F-count = 17.765 greater than F-table = 5.70 at  $\alpha = 0.05$ . This result means that the coefficient of determination of dynamic equilibrium with kansetsu Geri ability in karateka 0.260 (26%) is significant meaning that the hypothesis that states there is a relationship between physical condition components in terms of dynamic balance with kansetsu Geri ability in karateka is accepted. In other words, the better the dynamic balance, the better the kansetsu Geri ability in karateka.

The coefficient of determination obtained for the interrelation of physical condition components in terms of dynamic balance with kansetsu Geri's ability in karateka is 0.260 (26%). Thus, the relationship between physical condition components in terms of dynamic balance with kansetsu Geri's ability in karateka by 26%.

**The relationship between the components of physical condition is seen from the flexibility of the leg split with the ability of kansetsu Geri in karateka.**

The first hypothesis tested in this study is that there is a relationship between the components of physical condition in terms of the flexibility of the leg split to the ability of Kansetsu Geri in karateka.

Based on the results of simple linear regression analysis between pairs of leg split flexure research data on the ability of Kansetsu Geri in karateka resulted in a constant (a) of 17.123 with a regression direction coefficient (b) = -0.303, the relationship of the physical condition component in terms of the leg split flex to the ability of Kansetsu Geri in karateka obtained regression equation  $Y = 17.123 + 0.303 X_3$ . The results of the significance and linearity test calculations for the regression equation are presented in the ANOVA table as shown in the following table:

**Table 7.**  
 ANOVA test significance and linearity of regression Y over X3  
 $Y = 17,123 + 0.303 X_3$

Type	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	78.436	1	78.436	12.849	.001a
Residuals	170.930	28	6.105		
Total	249.367	29			

The results of the table above, for the linearity test of the regression of Kansetsu Geri's ability on karateka over the leg split flex variable (X3), obtained F-count (Tc) 12.849 with p-value = 0.001 > 0.05, this means Ho is accepted. Thus it can be concluded that the form of the equation  $Y = 15.786 + 0.407X_3$  regression is linear. While the regression significance test obtained an F-count value of 17.239, and p-value = 0.001 < 0.05. This means that Ho is rejected, thus showing that the form of the regression equation  $Y = 17.123 + 0.303 X_3$  is significant.

The constant value of 17.123 in the regression equation above is a fixed value, which means that if the leg split flex variable (X3) is 0, then the kansetsu Geri ability in karate has a value of 17.123. Furthermore, a positive regression coefficient (0.534) means that there is a directly proportional influence between the leg split on the kansetsu gery ability That is, every increase in one leg split score will be followed by an increase in the kansetsu gery ability score by 0.534 at a constant of 17.123.

To see the amount of leg split on the ability of kansetsu Geri can be seen from the amount of the coefficient of determination obtained a summary of the results of the calculation of the coefficient of determination and test F can be seen in the following table.

**Table 8.**

Test the significance of the coefficient of determination of leg split flexion with the ability of mawashi geri in karateka.

Variable	Number of Observations	Coefficient of Determination	F-count	F table a=0.05
Split Legs (X3) Kansetsu Geri Ability (Y)	30	0.315	18.832	4,17

From the results of the calculation of the significance test, the coefficient of determination is known to be F-count = 18.832 greater than F-table = 4.71 at  $\alpha = 0.05$  Based on these results, it can be concluded that the coefficient of determination of the linkage of physical condition components in terms of the flexibility of the leg split to the ability of Kansetsu Geri in karateka of 0.315 (31.5%) is significant. Thus, the first hypothesis that there is a relationship between the components of physical condition in terms of the flexibility of the leg split to the ability of Kansetsu Geri in karateka is accepted. In other words, the higher

the flex of the split legs, the higher the ability of Kansetsu Geri in karate martial arts. With a coefficient of determination value of 0.315 (31.5%), the relationship of physical condition components in terms of leg split flexibility to the ability of Kansetsu Geri in karateka by 31.5%.

**The relationship between the components of physical condition is seen from the explosive power of the legs, dynamic balance, and the flexibility of the split legs with the ability of kansetsu Geri in karateka.**

The fourth hypothesis tested in this study is "there is a relationship between the components of physical condition in terms of leg explosive power, dynamic balance and leg split flexibility to the ability of kansetsu Geri in karateka.

Based on the results of multiple regression analysis between pairs of leg explosive power (X1), dynamic balance (X2) and leg split flexion (X3) on the kansetsu Geri ability in karateka (Y) resulted in a constant (a) of -3.999 and a regression direction coefficient for leg explosive power (b1) = 0.056, dynamic balance (b2) = 0.101 and leg split flex (b3) = -0.212. Thus, the relationship between leg explosive power, dynamic balance, and leg split flexibility simultaneously to the ability of kansetsu Geri in karateka obtained the regression equation  $Y = 0.056X1 + 0.101X2 + 0.212X3$ . The results of the calculation of the regression equation significance test are presented in the table as follows:

**Table 9.**  
 ANAVA Multiple regression significance and linearity test  
 $Y=0.056X1 + 0.101X2 + 0.212X3$

Type	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	129.380	3	43.127	9.345	.000a
Residuals	119.987	26	4.615		
<b>Total</b>	<b>249.367</b>	<b>29</b>			

From the table testing the significance of the regression equation above, it can be concluded that the multiple regression performance  $Y = 0.056X1 + 0.101X2 + 0.212X3$  is significant. The conclusion is based on the value of F-count = 9.345 and P-Value = 0.000 < 0.05. This means Ho is Rejected.

The calculation of the termination coefficient which shows the amount of contribution of leg explosive power (X1), dynamic balance (X2) and leg split flexibility (X3) to the ability of kansetsu Geri in karateka (Y) shown by the double determination coefficient test can be seen in the following table:

**Table 10.**  
 The results of the significance test of the coefficient of determination of leg explosive power, dynamic balance, and leg split flexion with kansetsu Geri ability on the Gojukai karateka.

Variable	Number of Observations	Coefficient of Determination	F-count	F table a=0.05
Split Leg(X3) Kansetsu Geri ability (Y)	30	0.519	17.298	4,17

The F-count value obtained is 17.289 and the F table value at  $\alpha = 0.05$  is 4.17. The value of  $F_{\text{calculate}} > F_{\text{table}}$  so that it can be concluded that the coefficient determination of leg explosive power (X1), dynamic balance (X2) and leg split flexibility (X3) on the ability of kansetsu Geri in karateka (Y) has a double coefficient of determination  $(R_{y1,2,3}) = 0.519$  is significant. The coefficient of determination obtained for leg explosive power (X1), dynamic balance (X2) and leg split flex (X3) on the kansetsu Geri ability of karateka (Y) was 0.519 (51.9%). Thus, the relationship between leg explosive power (X1), dynamic balance (X2) and leg split flex (X3) to the ability of kansetsu Geri in karateka (Y) was 51.9%

## Discussion

### **The relationship between the analysis of physical condition components in terms of the explosive power of the legs with the ability of kansetsu Geri in karateka.**

The results of testing the second hypothesis found that the explosive power of the legs has a positive and significant contribution to the kansetsu Geri ability in karateka. Based on the calculation results, the value of the coefficient of determination of 0.303 is interpreted as a contribution value of 30.3% which is explained through the regression equation  $Y = -0.6.564 + 0.098X1$ . The results obtained when associated with the underlying frame of mind and theoretical theory, then basically the results of this study supports the existing theory. Leg explosive power is a component of physical condition that is closely related and is one of the determining factors for success in sports activities. According to Junusul Hairy (1989), anaerobic power is energy that can be produced or work that can be done at maximum speed without any significant assistance from aerobic energy production (mitochondria). According to Harsono (1988), muscle explosive power is the ability of muscles to move at maximum strength in a very fast time. Furthermore, Harsono (1988), expressed his opinion that "power" is especially important for sports where the tlet must move explosive power, besides that "power" is also necessary for hitting, kicking, parrying and attacking. Both opinions have explained or defined the explosive power of the legs which vary but provide the same understanding and explanation. Therefore, it can be concluded that in this case, the scratching carried out requires speed of movement, which also does not require too much power. The explosive power of the legs is the power that is released quickly when hammering certain movements without requiring extra power. When seen in doing mawashi geri kicks it takes a blast of muscle that can make kicks can be done without draining a lot of energy from the athletes.

### **The relationship between the analysis of physical condition components in terms of dynamic balance with the ability of kansetsu Geri in karateka**

The results of testing the second hypothesis found that dynamic balance has a positive and significant relationship with the ability of kansetsu Geri in karateka. Based on the calculation results, the value of the coefficient of determination of 0.260 is interpreted as a contribution value of 26% which is explained through the regression equation  $Y = 5.167 + 0.210X2$ . The results obtained when related to the framework and underlying theories, then basically the results of this study support existing theories. As stated by Harsono (1988) "Balance contributes to self-coordination, and in some skills, also to agility". Thus, to maintain balance in carrying out physical activities, the movements carried out need to be well coordinated to control all movements. According to Moch. Sajoto (1988) about the ability to master the location of the point of weight better known as a balance, balance or balance is the ability of a person to control his muscle organs during rapid movements with static or dynamic states or even more in a state of motion or dynamic. Furthermore, Harsono (1988) suggests that balance is "the ability to maintain our nonmuscular system in a static condition, or control the nonmuscular system in an efficient position or attitude as we move". Usually, many sports require sports (athletes) to accelerate in a short time from a stationary position. If this is necessary, the athlete can put his body in a moving position so that it is easy to lose balance, to then choose a new bluff. For example, when doing a kansetsu geri kick.

### **The relationship of physical condition components in terms of leg split flexibility to the ability of Kansetsu Geri in karateka**

The results of testing the first hypothesis found that the flexion of the leg split has a significant relationship with the ability of Kansetsu Geri in karateka. Based on the calculation



results, the value of the coefficient of determination of 0.315 is interpreted as a contribution value of 31.5% which is explained through the regression equation  $Y = 17,123 + 0.303X_3$ . The results obtained when related to the framework and underlying theories, then basically the results of this study support existing theories. As stated by Sudarno SP (1992): "stretching exercises can be done in two ways, namely statically and ballistically. Static stretching is done without wrinkling the body part, so with extra energy, which is continued to thank the farthest stretching position in some time. Ballistics elongation is accompanied by active stretching motion, so without maintaining the farthest position". Flexibility or flexibility is the body's ability to make flexible or flexible movements. Flexing exercises are usually done with stretching and stretching exercises. Flexibility can provide maximum ability to perform obstacles in various types of martial arts. Flexibility has a very big role in mastering good movements in sports. Flexibility makes it easier for athletes to learn movements, techniques, and tactics in martial sports, especially karate.

### **The relationship between the analysis of physical condition components in terms of leg explosive power, dynamic balance, and leg split flexibility with the ability of kansetsu Geri in karateka**

The results of testing the third hypothesis show a simultaneous relationship between leg split flexibility, leg explosive power, and dynamic balance with the ability of kansetsu Geri in karateka. Based on the calculation results, the value of the coefficient of determination of 0.519 is interpreted as a contribution value of 51.9% which is explained through the regression equation  $Y = 0.056X_1 + 0.101X_2 + 0.212X_3$ . It can be seen that there are still 48.1% of other factors that contribute to the ability of kansetsu geri that are not studied by researchers. When kicking, karateka (karate athletes) need strength and speed that can be used to direct the kick to the right position or target wine so that the kick can get the maximum value without requiring or expending a lot of energy, therefore in doing kicks with kansetsu Geri techniques are required to have some components of adequate physical condition, like; leg explosive power, dynamic balance, and leg split flexion. Thus, if the explosive force of the legs, dynamic balance, and split flex of the legs are jointly applied when performing kansetsu geri, it is predicted to produce a perfect kick, which is a fast kick and hits the target precisely.

## **CONCLUSION**

The final results of the research presented are based on the theoretical studies presented in the literature review and the framework and the results of data analysis that have been tested, the following research conclusions can be drawn:

1. There is a relationship between the components of physical condition in terms of the explosive power of the legs to the ability of kansetsu Geri in karateka, with a value of 30.3%.
2. There is a relationship between the components of physical condition in terms of dynamic balance to the ability of kansetsu geri in karateka, with a value of 26%.
3. There is a relationship between the components of physical condition in terms of leg split flexibility to the ability of kansetsu Geri in karateka, with a value of 31.5%
4. There is a relationship between the components of physical condition in terms of leg explosive power, dynamic balance, and leg split flexibility to the ability of kansetsu Geri in karateka, with a value of 51.9%

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