

## VO2MAX AND AGILITY TO FUTSAL DRIBBLING TECHNIQUE SKILLS

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**Abstrak** This study aims to determine the effect of VO2max and agility on basic futsal technical skills. This study is a regression correlation study on how much influence the VO2max variable and the agility variable have on dribbling skills. The study population was the students who took futsal extracurricular activities at SMP Negeri 9 Malang. The samples were taken by random sampling. The number of samples used was 35 students who took futsal extracurricular activities. The results of this research partially indicate that there is a negative and significant effect ( $p > 0.05$ ) of VO2max on ball dribbling skills as indicated by the t test results of -8.969 with a regression coefficient of -0.135, and agility towards ball dribbling skills is shown from the t test results of 2,416 with a regression coefficient of 2,333. There is a significant effect ( $p < 0.05$ ) of agility on ball dribbling skills as indicated by the t test results of 2.416 with a regression coefficient of 0.106. Meanwhile, simultaneously (simultaneously) on the ball dribbling skills a significant effect is shown by the F value of 51.477. Based on the results of data analysis in research on VO2max and agility towards ball dribbling skills, it can be concluded that collectively (simultaneously) there is a significant effect on the level of cardiovascular endurance (VO2Max) and Agility on the dribbling skills of futsal extracurricular members of SMP Negeri 9 Malang. .

**Keywords:** VO2max, Agility, ball dribbling skills

## INTRODUCTION

Futsal is a sport that has begun to develop in Indonesia and is in great demand by the wider community, starting from the existence of clubs, offices, villages and in schools. The sport of futsal is very much considered in Indonesia, as evidenced by the number of futsal clubs and competitions in all regions. For schools it also supports such as the futsal extracurricular activities held in schools, starting from Elementary School (SD) to Senior High School (SMA), even up to universities. According to (Lhaksana, 2011) futsal is a very fast and dynamic game. Futsal is a team sport, high collectivity will raise high achievement. The game must be played with fun and enjoyment. Next (Setijono, 2012) stated that futsal is a game that is played quickly and dynamically. Played on a small field where there is almost no room for player mistakes.

In playing futsal, the principle is that players always try to control the ball, pass correctly, dribble the ball past the opponent, try to grab the ball when the ball is controlled by the opponent, take kicks or shooting towards the goal accurately and defend their own area from being broken into by the opponent. (Moore et al., 2014). In order to play futsal properly and correctly, futsal players need a good level of endurance (VO2Max) and have pretty good skills.

A player's dribbling skills to play futsal must have a level of endurance (VO2Max) and agility. (Hastuti, 2013; Nurrochmah, 2016) argues that agility is the ability to change direction and the body quickly and precisely when it is moving, without losing balance and awareness of body position. By having good agility,

futsal players can change direction at any time when dribbling to get past the opponent. a good futsal player can be developed into a good futsal player, able to perform technical skill movements and tactics maximally in playing futsal is the result of the benefits of endurance (VO2Max) and the skills possessed by futsal players.

According to (Titz, 2012) dribbling is the player's ability to control the ball well without being captured by the opponent, either by walking, running, turning, or turning. According to (Komarudin, 2011) the purpose of dribbling is to pass the opponent, direct the ball into the empty space, escape from the opponent's swarm, open up space for friends, and create opportunities to shoot into the opponent's goal.

The dribbling technique has advantages over other techniques in the futsal game, if a player does not have good skills when dribbling the ball, this will cause difficulties for other players to position when carrying out attacks. By mastering the basic techniques of dribbling a player will be able to provide space for other players, as well as provide opportunities to score by passing opponents and opening up space for shooting. The basic technique of good dribbling is very much influenced by several factors, namely good ball possession, body balance when defending the ball, and functionally good physical condition, namely speed and agility when carrying out movements in acceleration.

According to (Kusumawati, 2013) the better the quality of the organs, the better and higher the VO2Max level of a player will be, so that it will increase endurance. Furthermore, if the better VO2Max endurance is owned, a futsal player can

perform various game techniques including dribbling well and at a later stage can improve performance.

The endurance level (VO2Max) of the players and the skills to play futsal are important factors in increasing the ability to play futsal in the training process. Increasing the quality of individual technique mastery and playing futsal techniques as a team is not only supported by technical skills, but it is necessary to improve all the components needed, especially endurance (VO2Max) which can give differences in the ability of individual futsal players in carrying out each type of training given. Futsal players who have a good VO2Max endurance level will also have the ability to complete exercises and matches without experiencing excessive fatigue. In fact, they can still carry out other activities (Aryuanto, 2016). The physical condition of the leg muscles' explosive power greatly affects the quality of playing football. Shooting the ball will not be able to achieve maximum results if the explosive power of the leg muscles is lacking and the high jump in heading is no longer able to be carried out optimally, this is due to the lack of leg muscle explosive power possessed by the player. The explosive power of the leg muscles does not only affect when shooting the ball and heading the ball, but also when running, passing and when dribbling the ball.

The technique of dribbling in futsal games is indeed very important, but endurance (VO2Max), especially VO2Max endurance, is the main support for developing skills in futsal games. Having a good level of endurance (VO2Max) is the most important thing and needs to be considered in determining futsal players. Being able to perform technical and tactical skill movements maximally

in playing futsal is the result of the benefits of endurance (VO2Max) that the futsal players themselves have. (Haryanto, 2017; Narlan et al., 2017)

Based on the results of observations and interviews conducted with the coach, the overall physical condition of the futsal extracurricular members of SMP Negeri 9 Malang is low, this is because the training program tends to focus only on technical training. The trainer also explained that he rarely does a cardiovascular endurance and agility training program. The trainer has also never tested the physical condition of the futsal extracurricular participants, so they do not have any references or concrete evidence to determine the ability of the physical condition, especially in the aspects of cardiovascular endurance and agility towards basic futsal dribbling technical skills. This can be seen when every match has never won a champion, because the players experience fatigue very quickly, lack of agility and lack of basic futsal dribbling techniques from each individual player. So far, futsal players have always prioritized perfect dribbling techniques rather than developing the level of endurance (VO2Max), this will cause fatigue and in the end players cannot pass their fellow players.

Based on the above background, the researcher wanted to know whether there was an effect of endurance (VO2Max) and agility on dribbling in playing futsal. Therefore, the researcher took the research title "The Effect of Endurance (VO2Max) and Agility on the technical skills of dribbling a Futsal player".

## **METHODS**

The research method uses correlation regression research methods. Correlation regression research is a way of comparing data from a number of units or individuals at the same time. Researchers do not provide treatment but only compare data based on facts using tests to find out and study. Subjects in this study were all futsal extracurricular participants at SMP Negeri 9 Malang, totaling 35 male participants. In this study more clearly and in detail, the definition of this study uses two variables, namely the dependent variable (dependent) and the independent variable (independent) and the independent variable. In this study is the level of cardiovascular endurance (VO2Max) and agility. The dependent variable is the futsal ball grading skill. The test instruments used to collect data in this study used the Bleep test and Illinois test and dribbling test instruments in futsal. Sources of data used in this study are primary data taken directly from futsal extracurricular participants at SMP Negeri 9 Malang with data collection methods by conducting field studies (Field Research), data collection by direct observation of extracurricular futsal participants at SMP Negeri 9 Malang.

**RESULTS**

The research data used for the analysis were the cardiovascular endurance test scores (VO2max) and the agility test scores for futsal extracurricular participants at SMP Negeri 9 Malang. The description of the research data is presented in Table 1 below.

**Table 1.**

Data Description of Cardiovascular Endurance Test Results (VO2max) and

Agility of Futsal Extracurricular Participants at SMP Negeri 9 Malang

	VO	Agility	Futsal dribbling
Test Result Data	<i>max</i> (in ml / kg / minute)	(in seconds)	(in seconds)
n	35	35	35
min	20.00	23.03	12.10
max	43.30	18.57	15.55
<i>Mean</i>	30.23	20.33	13.77

Information.

n = Number of subjects

min = Minimum score of test results

max = Maximum score of test results

the mean = Average test results

No.	Interval Class	Classification	Absolute Frequency	Relative Frequency
1	> 55.9	Superior	0	0%
2	51.0-55.9	Very well	0	0%
3	45.2-50.9	Good	0	0%
4	38.4-45.1	Moderate	1	2.86%
5	35.0-38.3	Less	3	8.57%
6	<35.0	Very less	31	88.57%
	amount		35	100%

SD = Standard deviation

Based on data on the cardiovascular endurance level (VO2max) of futsal extracurricular members at SMP Negeri 9 Malang (see Table 2) with a range of scores between 20.00 and 43.30, the mean score was 30.23, the standard deviation ( SD) of 5.38, then converted and classified according to the norms of cardiovascular endurance (VO2max) as shown in Table 2 below.

**Table 2.**

Classification of Cardiovascular Endurance Levels (VO2max) for Futsal Extracurricular Participants at SMP Negeri 9 Malang

Based on research on cardiovascular endurance tests of 31 futsal extracurricular participants (88.57%) in SMP Negeri 9 Malang, they were classified as very poor, 3 futsal extracurricular participants (8.57%) were classified as lacking, 1 futsal extracurricular participant (2, 86%) was classified as moderate, and not one participant (0%) had cardiovascular endurance which was classified as good, excellent, or superior.

Based on the data on the agility level of the futsal extracurricular members of SMP Negeri 9 Malang (see Table 1) with a range of scores between 23.03 to 18.57, the average score (mean) was 20.23, the standard deviation (SD) was 1, 11, then converted and classified according to the Norma level of agility as shown in Table 3 below

**Table 3.**

Classification of Futsal Extracurricular Participants Agility Level in SMP Negeri 9 Malang

No.	Interval Class	Classification	Absolute Frequency	Relative Frequency
1	<15.2	Very well	0	0%
2	15.2-16.1	Good	0	0%
3	16.2-18.1	Moderate	0	0%
4	18.2-19.3	Less	8	22.86%
5	> 19.3	Very Less	27	77.14%
	amount		35	100%

Based on the agility test research of 27 futsal extracurricular participants (77.14%) at SMP Negeri 9 Malang were classified as very poor, 8 futsal extracurricular participants (22.86%) were classified as lacking, and not one participant (0%) which has the agility that is included in the classification of medium, good, or very good.

**Research Hypothesis Testing**

**T test test**

The t test is used to test the regression coefficient partially, with the aim of knowing how much the variable cardiovascular endurance level (VO2Max) and agility partially affect the ball dribbling skill variable with a confidence level of 5%.

**Partial test of the effect of cardiovascular endurance level (VO2Max) on ball dribbling skills**

The results of the Agility Test on Ball Dribbling Skills show that the t-test statistical value for the regression coefficient is  $-8.969 >$  the t-table value of significance is  $0.000 < 0.05$ , thus there is a hypothesis which says there is a significant effect on the level of cardiovascular endurance (VO2Max) on Dribbling Skills. football extracurricular futsal participants Junior High Negeri 9 Malang is acceptable.

**Partial Test of the effect of Agility on Ball Dribbling Skills**

The results of testing the effect of agility on ball dribbling skills show that the t-test statistical value for the regression coefficient is  $2.416 >$  the t-table value of significance is  $0.022 < 0.05$ , thus there is a hypothesis that Agility has a significant effect on the ball dribbling skills of futsal extracurricular participants. Junior HighNegeri 9 Malang is acceptable. This can be seen in the following table:

**Table 4.**

Partial Test (t test)

Coefficientsa					
Unstandardized Coefficients		Standardized Coefficients		t	Sig.
B	Std. Error	Beta			
15,703	1,095			14,343	,000
-,135	,015	-,796		-8,969	,000
,106	,044	,214		2,416	,022

**F test test**

The F test is used to test the regression coefficient together (simultaneously), aims to determine how much all variables (X) simultaneously (simultaneously) affect variable Y, with a confidence level of 5%. The test results show that the variable level of cardiovascular endurance (VO2Max) and the Agility variable together (simultaneously) have an effect on the Dribbling Skills variable for the futsal extracurricular members. Junior High Negeri 9 Malang.

F test results of  $51.477 > F$  table with a significance level (Sig.) Is 0.000, the probability is 0.000 smaller than 0.05, thus the hypothesis which says

There is a significant effect of VO2max and Agility together (simultaneously) on the ball dribbling skills of the futsal extracurricular members of SMP Negeri 9 Malang which can be significantly accepted. The results of multiple linear regression analysis are as follows:  $KD = 15.703 - 0.135 * VO2Max + 0.106 * Agility$

**Result of the Coefficient of Determination (Adjusted R2)**

**Analysis of the coefficient of determination**

The results of calculations using the SPSS program show that the adjusted R2 value is 0.748 or 74.8%. This means that the ball dribbling skills variable of the futsal extracurricular members Junior High Negeri 9 Malang It can be explained from the variation in the variable level of cardiovascular endurance (VO2Max) and agility contributing 74.8%, this is quite good, while the remaining 25.20% is explained by other variables not included in this research model. The adjusted R2 value in this study can be seen in the following table:

**Table 5.**

The coefficient of determination of VO2max and Agility together (simultaneously) on the ball dribbling skills of the futsal extracurricular members of SMP Negeri 9 Malang.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.873a	.763	.748	.46025

a. Predictors: (Constant), Agility, Cardiovascular Endurance

**Discussion**

The constant of the amount states that if the level of cardiovascular endurance (VO2Max) and Agility are considered zero, then the ball dribbling skills of the futsal extracurricular members of SMP Negeri 9 Malang are significant, this is indicated by the results of the t test with a t value of  $14.343 > t$  table with a probability of equal to  $0.0000 < 0.0515,703$

Partially the variable cardiovascular endurance level (VO2Max) turned out to have a negative and significant effect on the soccer dribbling skills of the futsal extracurricular members. Junior High Negeri 9 Malang, negatively and significantly, this is indicated by the value of the regression coefficient of the variable Cardiovascular endurance level (VO2Max) of -0.135 with the t test of -8.969 and a significance level of 0.000, smaller than the specified  $\alpha$  value of 5% (0.05). The variable level of cardiovascular endurance (VO2Max) has a considerable influence compared to the Agility variable on the Dribbling Skills of the futsal extracurricular members. Junior High Negeri 9 Malang.

This study indicates that the higher the level of cardiovascular endurance (VO2Max) the more skilled a futsal player is seen from the faster

dribbling time by providing the right training program, because the characteristics of the game of futsal require excellent physical condition so that it can create a game pattern. effective (Suhartoyo et al., 2019). To improve physical condition, it is necessary to increase nutritional intake and regular physical exercise.

From the observation, it can be seen that the level of cardiovascular endurance (VO2Max) of futsal extracurricular members at SMP Negeri 9 Malang is mostly very low and there are some players with high levels of cardiovascular endurance (VO2Max) with good skills seen during training and competing.

The results of this study are in line with the research conducted by (Charisma & Mubarak, 2020). The results of the study were almost the same, namely the aerobic endurance conditions possessed by female futsal athletes still needed to be improved because they were still in the insufficient and sufficient category. The results of previous research show that the elements of the physical condition of VO2Max are the main things that futsal athletes must have, apart from other elements of physical conditions, such as speed and agility.(Musrifin, 2018). VO2Max plays an important role in the futsal sport. But what is more important is not only the amount of VO2Max, but the large percentage of VO2Max usage during training or competition.(Mas & Faruk, 2013).

Partially the Agility variable has a positive and significant effect on the soccer dribbling skills of the futsal extracurricular members. Junior High Negeri 9 Malang, this is indicated by the value of the Agility variable regression coefficient of 0.106 with a t test of 2.416 and a significance level of

0.022., smaller than the specified  $\alpha$  value of 5% (0.05).

This study indicates that the more agile a futsal player will improve his skills, this can be seen from the faster dribbling time both in training and in competing. If a player has good agility it can save energy in a game. Agility is also needed in freeing oneself from opponent's control by dribbling past the opponent by attacking to create a goal that will lead to victory.

This research is relevant to research (Gunawan et al., 2016) who said that there was a significant effect of agility on dribbling skills in soccer games on football extracurricular activities at SMPN 10 Malang. Different studies were conducted (Gunawan et al., 2016) said that agility had no effect on the dribbling skills of futsal players at O2SN, Sumedang Utara District. Together, the variable cardiovascular endurance level (VO2Max) and the agility variable have a significant effect on skills

*Dribbling bola futsal* extracurricular participant Junior High Negeri 9 Malang, this is indicated by the F value of  $51.477 > F$  table with a significance level (Sig.) Is 0.000 less than 0.05 with a coefficient of determination or the adjusted R2 value was 0.748 or 74.8%.

This study indicates that simultaneously the variable cardiovascular endurance level (VO2Max) and the Agility variable simultaneously have a significant effect on the football dribbling skills of the futsal extracurricular participants. Junior High Negeri 9 Malang and has a high enough explanatory factor to explain the relationship between the Agility variable having an influence on the Dribbling Skills of the futsal

extracurricular members. Junior High Negeri 9 Malang The coach always provides directions when carrying out training and during competitions to the futsal extracurricular members Junior High Negeri 9 Malang to always increase the level of cardiovascular endurance (VO2Max) and increase agility in order to improve dribbling skills during training and during matches.

This research is relevant to research (Iqbal ZR & Bulqini, 2019; Purnomo, 2018) said that together there is a significant effect on the level of cardiovascular endurance (VO2Max) and the Agility variable simultaneously have a significant effect on the dribbling skills of futsal extracurricular participants. Junior High Negeri 9 Malang and has a high enough explanatory factor to explain the relationship between the Agility variable having an influence on the skill of dribbling (Dribbling).

### CONCLUSIONS

The research results can be concluded as follows:

1. There is a partially significant negative effect on the level of cardiovascular endurance (VO2Max) on the dribbling skills of futsal extracurricular participants Junior High Negeri 9 Malang.
2. There is a partially significant positive effect Agility on dribbling skills for futsal extracurricular members Junior High Negeri 9 Malang.
3. Taken together (simultaneously) there is a significant effect on the level of cardiovascular endurance (VO2Max) and Agility on the dribbling skills of futsal extracurricular participants. Junior High Negeri 9 Malang

### Suggestion

The results of this study try to provide several suggestions:

1. To increase the level of cardiovascular endurance (VO2Max) futsal players, coaches need to advise all players to increase their intake of nutritious foods and consume fruits that contain minerals and vitamins that can increase cardiovascular endurance (VO2Max) so that they can dribble ) both in training and in matches.
2. Agility is needed to dribble (dribbling) because it requires a considerable portion of practice and the seriousness of the players in training. The right and left agility needs to be improved through intensive and routine training which can affect the dribbling ability

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