



The Influence of Speed, Flexibility and Agility on the Dribbling Ability of Futsal Players Vamos Academy Padang

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Abstract: Dribbling ability is one of the main skills that every futsal player must have to support performance on the field. This study was conducted to understand how speed, flexibility, and agility affect the dribbling ability of futsal players at Vamos Academy Padang. This study uses the path analysis method with purposive sampling technique. The instruments used include a 20 meter sprint speed test, agility test with zig-zag run test, flexibility test using sit and reach, and dribbling ability test through slalom dribbling test. The results showed that: (1) speed has a significant direct effect on dribbling ability with a significant value of 0.321; (2) flexibility also has a significant effect on dribbling ability with a significant value of 0.470; (3) agility significantly affects dribbling ability with a significant value of 0.240; (4) no significant effect of speed on dribbling ability through agility (0.164); (5) no significant effect of flexibility on dribbling ability through agility (0.077); and (6) speed, flexibility, and agility simultaneously have a significant effect on dribbling ability. In conclusion, speed, flexibility, and agility are important factors that directly affect the dribbling ability of futsal players.

Keywords: Agility; Dribbling; Flexibility; Futsal; Speed

Introduction

Futsal is a sport that is increasingly popular in various circles. This game requires players to have various basic skills that support performance on the field, one of which is dribbling ability (Kilit et al., 2019). Good dribbling ability allows players to control the ball, pass opponents, and create opportunities in matches (Ilham et al., 2024; Muller et al., 2023; Sari et al., 2024; Selviani et al., 2024). Therefore, dribbling is an important aspect that must be developed by every futsal player, especially for players who want to compete at a competitive level (Keerthika et al., 2024).

A player's dribbling ability is strongly influenced by several physical factors, including speed, flexibility, and agility (Indika et al., 2023; Sari, Bafirman, et al., 2023; Selviani et al., 2023; Selviani et al., 2024). Speed is the ability to move or change places in the shortest possible time (Lucia et al., 2023). In the context of futsal, speed

helps players to quickly control the ball, pursue opportunities, or avoid opponent pressure. Players who have high speed tend to be able to create a competitive advantage on the field (Ilham et al., 2024; Prasetyo et al., 2024; Selviani et al., 2024; Shi et al., 2024).

Determination, on the other hand, refers to the body's ability to perform movements with maximum flexibility and range of motion in the joints (Azarkasb & Khasteh, 2024; Wilke et al., 2020). In dribbling, flexibility plays an important role in optimizing ball control, especially when players have to make movements that require body flexibility, such as sudden changes in direction or avoiding opponent tackles (Olajos et al., 2020; Tyler et al., 2020).

Meanwhile, agility is the ability to make changes in direction quickly and effectively without losing balance (Ilham et al., 2024; Nyoman et al., 2024; Padli et al., 2024; Prasetyo et al., 2024). In a dynamic futsal match situation, agility allows players to move agilely when facing

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opponent pressure or looking for gaps to get past the defense (Buchanan et al., 2023; Sungpook et al., 2022). The combination of agility with speed and flexibility makes players more effective in dribbling in complex situations (Fort-Vanmeerhaeghe et al., 2022).

Although each of these factors has its own role, research on the simultaneous influence of speed, flexibility and agility on dribbling ability is still limited, especially among young futsal players. This study seeks to fill the gap by analyzing in depth how these three variables affect the dribbling ability of futsal players at Vamos Academy Padang. By using the path analysis method, this research is also expected to provide a more comprehensive picture of the direct and indirect relationships between these variables.

The results of this study not only provide a theoretical contribution to the field of sports, but can also be a practical reference for coaches and players in developing effective training programs to improve dribbling skills. In addition, this research also opens up opportunities for further exploration in understanding various other factors that affect the performance of futsal players.

Method

This research uses a path analysis approach. This method is used to analyze the pattern of relationships between variables, with the aim of knowing the direct and indirect effects of independent variables (exogenous) on the dependent variable (endogenous). Path analysis helps identify the most effective and significant path from the independent variable to the last dependent variable (Sari et al., 2023; Sari et al., 2024).

The population in this study were all futsal players at Vamos Academy Padang. The sample was selected using *purposive sampling* technique, with the criteria that players who are actively practicing, have a minimum playing experience of 1 year, and are eligible to take the physical test conducted totaling 25 people.

The instruments used in this study include: Speed Test: 20 meter sprint, to measure the player's running speed. Flexibility Test: Sit and Reach Test, to measure the flexibility of the player's body. Agility Test: Zig-zag Run Test, to measure the player's ability to make rapid changes in direction. Dribbling Ability Test: Slalom Dribbling Test, to measure players' dribbling skills. Data were collected through field tests that measured dribbling speed, agility, flexibility, and running speed. Test results were analyzed using path analysis techniques to determine the pattern of relationships between variables. It is the same as in the figure 1.

Data analysis involved several stages: Data description Statistical description of the test results of

each variable. Test of Analysis Requirements: Normality test using Lilliefors test, Linearity Test testing the linear relationship between variables using regression. Test results were analyzed using statistical software with significance testing at the 95% confidence level ($p < 0.05$). Path analysis was conducted to identify the magnitude of the influence of each independent variable on the dependent variable directly or indirectly.

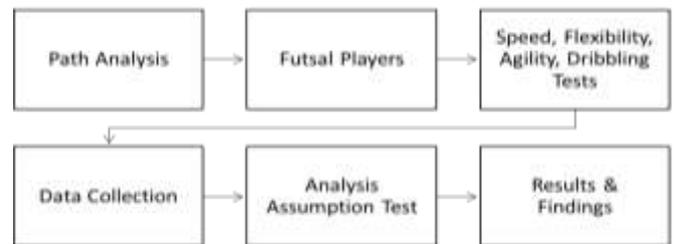


Figure 1. Flowchart of research

Result and Discussion

The analysis requirement test is carried out as a basis for consideration for selecting and determining the data analysis technique used in hypothesis testing. The prerequisite analysis in this study includes normality testing and *Linearity* testing using SPSS 27.0.

Table 1. Lilliefors Normality Test

Variable	Shapiro-Wilk		
	Statistic	df	Sig.
Speed	0.933	16	0.27
Flexibility	0.891	16	0.057
Agility	0.955	16	0.574
Ability dribbling	0.911	16	0.119

Table 2. Summary of Linearity Test

Linearity	P-value	Conclusion
Dribbling Ability on Speed	0.322	Linear
Dribbling Ability on Flexibility	0.097	Linear
Dribbling Ability on Agility	0.095	Linear
Agility over Speed	0.070	Linear
Agility over Flexibility	0.140	Linear

Based on the data in table 1 and table 2 of the normality and linearity test results using SPSS version 27.0 above, it was found that all variables were normal and linear $p - value > 0.05$.

Table 3. Path Coefficient Model I

Model	Coefficient	
	Standardized Coefficients Beta	t Sig.
Constant		5.042 <.001
Speed	0.683	5.119 <.001
Flexibility	-0.319	-2.392 0.033

The magnitude of the R Square value in table 3 is 0.909. This shows that the contribution of the influence of X1 and X2 on Y is 90.9%. While 9.1% is influenced by other variables not included in this study. To find the value of ϵ , you can use the formula $\epsilon = \sqrt{1 - 0.909} = 0.302$. Figure 2 is explained in the form of a model 1 path diagram.

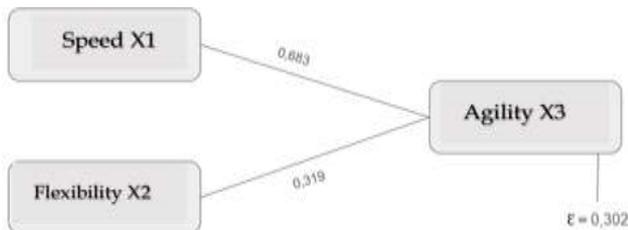


Figure 2. Model 1 path diagram

Table 4. Model II Path Coefficient

Model	Standardized Coefficients Beta	Coefficient t	Sig.
Constant		0.331	0.746
Speed	0.321	1.859	0.048
Flexibility	-0.47	-3.933	0.002
Agility	0.24	1.161	0.038

The magnitude of the R Square value is 0.953. This shows that the contribution of the influence of speed, flexibility and agility on dribbling ability is 95.3%. While 4.7% is influenced by other variables that are not included in this study. To find the value of ϵ , you can use the formula $\epsilon = \sqrt{1 - 0.953} = 0.216$. Figure 3 is explained in the form of a model 2 path diagram.

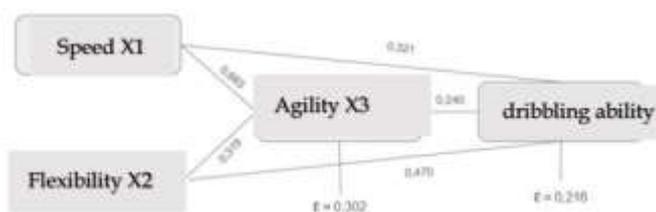


Figure 3. Model 2 path diagram

Effect of Speed on Agility

Based on the results of Model I Regression, the speed variable has a significant effect on agility in Vamos Academy Padang futsal athletes. It is known that the direct effect given by speed on agility is 0.683.

Speed is a basic physical element required in almost every sport (De Fano et al., 2023; Leite et al., 2024). Speed is one of the factors that affect a person's agility, this is because in agility which requires movement to change direction quickly there is an element of speed in addition to other elements that affect agility. It can be seen that athletes who have good speed also have good agility.

Several studies found that athletes who have a high running speed tend to show better agility (Ilham et al.,

2024; Pavlovic et al., 2024; Yuasa et al., 2018). Running speed, which involves acceleration and deceleration, plays an important role in the development of agility because it allows individuals to change direction quickly and efficiently.

Effect of Flexibility on Agility

Based on the results of Model I Regression, the agility variable has a significant effect on agility in Vamos Academy Padang futsal athletes. It is known that the direct effect given by flexibility on agility is 0.319.

Flexibility is one of the basic physical elements that affect agility (Feng et al., 2024; Wang et al., 2024). Determination plays an important role when an athlete moves or changes direction. Without good flexibility, an athlete's movements will tend to be stiff and slow, so this will certainly affect a person's agility. This can be seen where athletes who have good flexibility have good agility too.

Effect of Agility on Dribbling Ability

Based on the results of Model II Regression, the agility variable has a significant effect on dribbling ability in Vamos Academy Padang futsal athletes. It is known that the direct effect given by agility on dribbling ability is 0.240.

Agility plays an important role in a person's ability to dribble the ball. This is because dribbling the ball requires the ability to change direction to be able to avoid or pass opponents (Abbasi et al., 2025; Çaloğlu Büyükselçuk & Badem, 2024). Good agility indicates that a person has speed, flexibility, balance and other basic physical elements that are good in supporting dribbling ability. We can note that an athlete who has good agility also has good dribbling ability.

Indirect Effect of Speed through Agility on Dribbling Ability

It is known that the direct effect given by speed on dribbling ability is 0.321. While the indirect effect of speed through agility on dribbling ability is the multiplication of beta value (speed to agility) with beta value (agility to dribbling ability), namely: $0,683 \times 0,240 = 0,164$. Based on the above calculations, it is known that the direct effect is 0.321 and the indirect effect is 0.164, it means that the indirect effect is smaller than the direct effect, it concludes that indirectly speed through agility does not have a significant effect on dribbling ability.

The indirect impact of speed through agility on dribbling ability shows how a player's speed and ability to change direction quickly affects control and accuracy when dribbling. Speed alone allows players to move quickly, but agility and the ability to change direction quickly and maintain balance will increase effectiveness in dribbling. Agile players can easily pass opponents, with quick changes of movement to keep the ball safe.

So, the combination of speed and agility creates a dribbling style that is more agile and unpredictable, making it difficult for opponents to cut or grab the ball (Feng et al., 2024; Ilham et al., 2024).

The Effect of Flexibility through Agility on Ball Dribbling Ability

It is known that the direct effect given by agility on dribbling ability is 0.470. While the indirect effect of flexibility through agility on dribbling ability is the multiplication of beta value (speed to agility) with beta value (agility to dribbling ability), namely: $0,319 \times 0,240 = 0,077$. Based on the above calculations, it is known that the direct effect is 0.470 and the indirect effect is 0.077, it means that the indirect effect is smaller than the direct effect, so it concludes that indirectly flexibility through agility does not have a significant effect on dribbling ability.

The effect of flexibility through agility on dribbling ability is closely related to how a more flexible body can assist players in moving more freely and efficiently when dribbling. Flexibility allows muscles and joints to move in a wider range, providing an advantage when players have to make sharp movements or sudden changes in direction (La Greca et al., 2022). When combined with agility, which involves the ability to move quickly and change direction smoothly, flexibility gives players an advantage in maintaining balance and avoiding pressure from opponents. With a more supple body, players can maintain better ball control, especially when performing complex maneuvers or passing opponents in tight spaces (Angulo et al., 2020). Therefore, flexibility that supports agility can improve the quality of dribbling, making players more effective at dodging and moving quickly on the field (Ömer, 2020).

Conclusion

Based on the results of the study, it can be concluded that speed, flexibility, and agility are factors that directly have a significant effect on the dribbling ability of futsal players at Vamos Academy Padang. Speed has a significant influence with a value of 0.321, flexibility with a value of 0.470, and agility with a value of 0.240. This study also found an indirect effect of speed and flexibility on dribbling ability through agility. Overall, these three factors—speed, flexibility, and agility—play an important role in improving the dribbling performance of futsal players and should be the focus of training programs.

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Author Contributions

Rahmat Hidayat was responsible for research design, data collection, and analysis and interpretation of results. Ridho Bahtra played a role in the preparation of the theoretical framework, selection of research methods, and preparation of measurement instruments. Alnedral and Aldo Naza Putra contributed to data processing, validation of results, and preparation of discussion and conclusion sections. Randi Kurniawan was responsible for drafting the manuscript, editing, and final corrections before publication.

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Conflicts of Interest

The authors declare that there are no potential conflicts of interest related to this research.

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