Contribution of speed and agility to dribbling ability

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ABSTRACT

Problems: The problem of this research was identified because students often lose the ball when passing opponents, less than optimal dribbling speed so that it is easy to be chased by opponents, and low agility which causes movements to be easy to read. **Purpose**: This study aims to test the contribution of speed and agility to the ability of soccer dribbling in students. **Methods**: This study uses a quantitative approach through a correlational method, this study seeks to provide a scientific understanding of the relationship between physical variables (speed and agility) with technical abilities (dribbling). This study involved 26 students as research samples through a total sampling technique. The instruments used include a 30-meter running test for speed, a dogging run test for agility, and a dribbling test with 7 obstacles. Data analysis was carried out using correlation techniques with SPSS software version 24. **Results**: The results of the descriptive analysis showed that the average speed time was 5.68 seconds, agility 6.49 seconds, and dribbling 24.58 seconds. Students with the best speed and agility also recorded the fastest dribbling results, which indicates a positive relationship between basic physical abilities and dribbling skills. **Conclusion**: This study concluded that increasing speed and agility can significantly contribute to dribbling effectiveness. This finding is important as a basis for designing more targeted and evidence-based soccer training programs.
Keywords: Speed, agility, dribbling, football, correlation

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Introduction

Football is a game that can be played with a kicking motion, which aims to put the ball into the opponent's goal. Football is an action of attacking, defending and transitioning or in coaching terms is often called three main moments (Firmansyah et al., 2018). In football, there are locomotor, non-locomotor and manipulative movements (Kurniawan et al., 2020; Setiawan, 2020), where the three components are related to the ability to dribble the ball. The ability to dribble the ball is the motor skill that is most related to art, beauty, creativity and improvisation (Fernández-Espínola et al., 2020). In a broad sense, dribbling is a basic football technique used to control the ball and is a basic skill in football that allows players to pass opponents while maintaining control of the ball. (Christie, 2016; Pramdhan et al., 2022; S. Putra et al., 2023). Players who have good dribbling skills will be very helpful in helping the team win, because with good dribbling skills, athletes can get past one or two opponents so that the opponent's defence area is open. (Antara et al., 2023; Muzaffar & Saputra, 2019; Tomi & Umar, 2020).

Speed and agility are two components that players need to have to determine the success of a soccer player's dribbling. Speed is the ability to cover distance quickly, the ability to move quickly in a straight line is an integral component of successful performance in a variety of sports. (Kusuma & Irawan, 2022). Speed is a factor that enables individuals to perform motor actions as quickly as possible, as a result of neuromuscular system processes and body strength processes (Akbar & Cahyani, 2024; Dadang Sulistio, Sugiyanto, 2019). The function of speed is to make the activities carried out more effective and efficient (Aulia & M., 2020). Modern football really needs speed for football players, the transitions in football are so fast and alternating,

this is because of the aspect of attacking to defending and the transition from defending to attacking (A. N. Putra & Gazali, 2017).

A soccer player's dribbling ability will not be optimal if it is not balanced by agility skills. According to the study (Habibie et al., 2019), Agility is the ability to move and change direction and position of the body quickly and effectively under controlled conditions, this requires fast reflexes, coordination, balance, speed, and correct response to changing situations. Agility is necessary in response to external stimuli (i.e., the movement of the ball, opponents, teammates) and as an important part that a soccer player must have (Krolo et al., 2020). Agility ensures that the body is in the right position to perform the next action effectively and efficiently. This ability is very important in one-on-one situations and when building attacks individually. However, based on the results of the author's observations and observations of the basic football course, it was found that students' dribbling skills were still relatively low. This can be seen from the frequent loss of the ball by students when facing pressure from opponents, in addition, there are indications of a lack of speed when dribbling the ball, so that players are easily caught by opponents, as well as low levels of agility, which causes their movements to be easily read and anticipated by opponents.

This study aims to test how much speed and agility contribute to the ability of soccer dribbling in college students, with a quantitative approach through the correlational method, this study attempts to provide a scientific understanding of the relationship between physical variables (speed and agility) with technical ability (dribbling). The results of this study are expected to be a basis for coaches and sports educators in designing more effective training programs to improve player dribbling performance, especially at the college level.

Method
Study design and participants
This type of research is a correlational study that aims to determine the relationship between independent variables and dependent variables. The location of the research was carried out in the Faculty of Sport Science at the Lubuk Buaya field and the time of data collection was carried out on April 22, 2025. The sampling technique in this study used the total sampling technique with a sample size of 26 students. The research sample was students of basic football courses in the second semester with an average age of 18-20 years. The test instruments used in this study were 1) agility test using the dogging run test, 2) speed test using a 30-meter running test, 3) while the dribbling test used a dribbling test with 7 obstacles.

Test instruments and procedures
Agility Test – *Dogging Run Test*: Participants ran through a zigzag path marked with cones over 10 meters. They were instructed to complete it as fast as possible without touching the cones. Time was recorded with a stopwatch. The test was done on a dry, flat surface. Speed Test – *30 Meter Sprint*: Participants performed a 30-meter sprint from a stationary start. They were told to run at full speed. Timing started at the first movement and stopped at the finish line. The test was conducted on a flat surface in proper running shoes. Dribbling Test – *7 Obstacle Course*: Participants dribbled a ball through 7 cones spaced 1.5 meters apart. They were instructed to maintain control and complete the course quickly. Time was recorded from the first touch to crossing the finish line. The test was done on a grass field.

Statistical Analysis
The analysis technique in this study used the Pearson product moment correlation technique using IBM SPSS Statistics 24. Before conducting the Pearson Product Moment correlation analysis, a normality test was performed to ensure that the data met the assumptions for parametric testing. The Shapiro-Wilk test was used due to the sample size ($n < 50$). The results indicated that all variables were normally distributed ($p > 0.05$), thus justifying the use of Pearson correlation for further analysis.

Results
This study involved 26 students as samples to determine the contribution of speed and agility to dribbling ability in soccer games. Each participant underwent three types of tests, namely: a 30-meter speed test, an agility test using a dogging run test, and a dribbling test through 7 obstacles. The Pearson Product Moment correlation coefficients between each independent variable (speed and agility) and the dependent variable (dribbling) have been added, along with their respective significance values (p-values). Additionally, we have included the coefficient of determination to explain the contribution (percentage of influence) of each independent variable on the dribbling performance. This ensures consistency between the research design and the reported findings.

The description of the research results is as follows:

Speed Data

Tabel 1. Speed Value Description

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Speed	26	4.41	7.31	5.6754	.82386
Valid N (listwise)	26				

The average time achieved by students in the speed test was 5.68 seconds with a standard deviation of 0.82 seconds. The fastest value recorded was 4.41 seconds and the slowest value was 7.31 seconds. This shows that there is a fairly large variation in speed ability between students. An example of the fastest participant with a time of 4.41 seconds, while the slowest participant with a time of 7.31 seconds.

Agility Data

Table 2. Agility Value Description

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Agility	26	5.17	7.30	6.4869	.60585
Valid N (listwise)	26				

In the agility aspect, the average time achieved was 6.49 seconds with a standard deviation of 0.61 seconds. The fastest time in the agility test was 5.17 seconds and the slowest was 7.30 seconds. This variation in data indicates that not all students have the ability to change direction and move quickly and efficiently. The participant with the best agility was (5.17 seconds), while the one with the lowest score was (7.30 seconds).

Dribbling Data

Table 3. Dribbling Value Description

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Dribbling	26	15.91	35.29	24.5812	5.49257
Valid N (listwise)	26				

The average time required for participants to complete the dribbling test was 24.58 seconds, with a standard deviation of 5.49 seconds. The fastest value was recorded at 15.91 seconds and the slowest value was 35.29 seconds. The participant with the fastest dribbling with a time of 15.91 seconds, indicating excellent technical performance. On the other hand, the participant with the slowest dribbling time was Tifani (35.29 seconds), indicating the need for improvement in technical and physical aspects.

Speed, Agility and Dribbling Data

Table 4. Description of Speed, Agility, and Dribbling Values

Report			
	Speed	Agility	dribbling
Mean	5.6754	6.4869	24.5812
N	26	26	26
Std. Deviation	.82386	.60585	5.49257

Of the three variables, dribbling ability showed the highest level of variation, while agility had the most homogeneous distribution of performance. Speed fell between the two in terms of data variation. These findings suggest that a more individualized training program is likely to be more effective in improving dribbling ability, while a group approach is still appropriate for speed and agility training.

Results of Statistical Analysis

Table 5. Normality test (Shapiro-Wilk Test)

Variables	Statistics	df	Sig. (p)	Interpretation
Speed	0.960	26	0.275	Normal (p > 0.05)
Agility	0.949	26	0.187	Normal (p > 0.05)
Dribbling	0.935	26	0.094	Normal (p > 0.05)

All significance values are above 0.05, which means the data is normally distributed. Therefore, the Pearson correlation test can be used as an inferential analysis technique.

Table 6. Pearson Correlation Test (Product Moment)

Variable Relationships	Pearson r	Sig. (2-tailed)	Correlational Interpretation
Speed ↔ Dribbling	0.695	0.000	significant
Agility ↔ Dribbling	0.740	0.000	significant

There is a strong and significant relationship between speed and dribbling ability. An r-value of 0.695 indicates that the better a person's speed, the higher his ability to dribble. There is a very strong and significant relationship between agility and dribbling ability. An r value of 0.740 indicates that agility is more dominant than speed in supporting dribbling skills.

Tabel 7. Kontribusi Variabel Bebas terhadap Dribbling (r^2 atau Koefisien Determinasi)

Variables	r	r^2	Percentage (%)	Interpretation
Speed	0.695	0.483	48.3%	About 48.3% of dribbling ability is affected by speed.
Agility	0.740	0.547	54.7%	About 54.7% of dribbling ability is affected by agility.

Speed accounts for nearly half of the variation in students' dribbling scores. This shows that the ability to run fast linearly supports efficiency when dribbling. Agility exerts greater influence. This is logical considering that dribbling requires the ability to change direction, maintain balance, and control the ball in dynamic situations. The results of the Pearson correlation test, it can be concluded that both speed and agility have a significant relationship with students' dribbling skills. Agility showed a higher correlation than speed, with a contribution of 54.7% to dribbling results, while speed accounted for 48.3%.

Discussion

Speed is one of the most important components of physical condition in football. (Amir et al., 2020; Festiawan et al., 2021), especially when dribbling in dynamic match conditions. The average speed of students in this study was 5.68 seconds, with the fastest participant recording a time of 4.41 seconds and the slowest 7.31 seconds. This variation reflects differences in basic speed abilities between individuals. The fastest participant with a score (4.41 seconds) also showed very good dribbling ability (15.91 seconds), indicating a relationship between speed and success in dribbling the ball. According to the study results (Fahlevi et al., 2022; Sekulic et al., 2021), The faster a player moves, the greater his/her chances of breaking through the opponent's defense and keeping the ball while dribbling. On the other hand, participants who have slower running times such as (7.31 seconds) tend to record slower dribbling times (34.17 seconds). This shows that speed is not only useful during sprints or game transitions, but is also crucial in supporting effective dribbling techniques, especially in avoiding being chased by opponents or utilizing space.

Agility refers to the ability to change direction quickly and precisely while maintaining control of the body and the ball. (Arsyad et al., 2022; Carlos et al., 2023; Khairuddin et al., 2022). In the context of dribbling, agility plays a central role because dribbling involves not only straight movements but also quick and unexpected changes in direction. (Arsita et al., 2021; Choriyev, 2021). The average agility time of students was 6.49 seconds, with the fastest value of 5.17 seconds and the slowest 7.30 seconds. Similar to the speed variable, agility also showed quite significant variation between participants. Students with high agility (5.66 seconds) and (5.63 seconds) also had relatively fast dribbling times, namely 16.53 seconds and 18.84 seconds respectively. This confirms that agility contributes to the effectiveness of dribbling, especially in one-on-one situations that require quick reactions and sharp changes in direction. Conversely, participants with low agility

tend to have difficulty when dribbling. This can be seen in 7.30 seconds of agility, 27.03 seconds of dribbling, which shows that limitations in changing direction or maintaining balance when carrying the ball have an impact on the effectiveness of dribbling.

The average dribbling ability in this study was at 24.58 seconds, with a range between 15.91 seconds to 35.29 seconds. This difference is very striking and provides a strong indication that dribbling performance is greatly influenced by physical factors such as speed and agility. The student who recorded the fastest score in dribbling with a time of 15.91 seconds, was also the participant with the best score in speed 4.41 seconds and a fairly good agility score of 5.96 seconds. According to the Study (Jufrianis et al., 2018; Kusuma & Irawan, 2022; Neviantoko et al., 2020). This shows that a combination of good speed and agility can produce optimal dribbling performance. In contrast, the student who recorded the longest dribbling time of 35.29 seconds, had a speed of 6.17 seconds and agility (6.84 seconds) that was relatively low, supporting the finding that physical limitations have a significant impact on technical skills such as dribbling.

These descriptive results show a pattern that the better a person's basic physical abilities in terms of speed and agility, the better their dribbling ability. However, it needs to be tested statistically through Pearson Product Moment correlation to determine how strong the relationship is between these variables. If the correlation value shows a significant positive relationship, then it can be concluded that speed and agility training contribute significantly to improving dribbling performance.

Conclusion

In general, these results illustrate that there is significant diversity in students' speed, agility, and dribbling abilities. Some students show good performance in all aspects, while others appear weak especially in speed and agility which impacts dribbling ability. Thus, these data support the hypothesis that speed and agility contribute to dribbling results in soccer games. These three variables were measured to determine how much they contribute to dribbling skills as an important component in playing performance. Speed helps players in dribbling, especially during game transitions and facing pressure from opponents. While agility plays an important role in maintaining the ball during rapid changes of direction. The combination of both contributes directly to the effectiveness of dribbling, especially in one-on-one duels or dynamic game situations. Based on these findings, it is recommended that soccer training programs integrate speed and agility training in a structured manner, such as sprint drills, agility ladders, and change-of-direction training with the ball. Training should mimic real-world situations in matches to hone physical and technical skills simultaneously. In addition, periodic evaluation of speed, agility, and dribbling needs to be carried out to monitor individual development and adjust training programs. Training also needs to be personalized according to the physical profile of each athlete, considering that there is a significant variation in ability between players. The use of technology such as GPS trackers and acceleration sensors can help coaches analyse performance accurately and accelerate the training adaptation process.

Theoretically, this study strengthens the view that physical aspects such as speed and agility are the main determinants of technical skills in football, especially dribbling. The practical implication is that coaches need to balance physical and technical training in player development programs. Educationally, these results can be the basis for developing a physical education curriculum based on the integration of physical and motor skills. This study also opens up opportunities for further studies with quantitative approaches such as regression or structural models to evaluate multivariate relationships in more depth.

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