Application of speed and agility training: How do they affect dribbling skills in football?

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Authors’ contribution:
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Abstract
Background and Study Aim. Dribbling skills have a crucial role in the achievement of a football player, especially at a young age level such as the SSB Medan Satria U-16 Football team. This study aims to investigate the effect of speed and agility on the dribbling skills of SSB U-16 Medan Satria students.

Material and Methods. The method used in this research is experimental, the data collection techniques used are tests and measurements. The population in this study were SSB U-16 Medan Satria students. The sample taken from the results of purposive sampling amounted to 20 students. The instrument used is a dribbling skill test. Data analysis using the SPSS 26 application.

Results. The results showed a significance value of 0.000 <0.05 so there is a significant effect of speed training on dribbling skills of soccer games. The application of agility training shows a significance value of 0.000 <0.05 so that there is a significant effect of agility training on dribbling skills of soccer games. Further results show the comparison between speed training and agility training shows a significance value of 0.000 <0.05 which means that there is a significant difference between speed training and agility training, the results also provide information that speed training is better for improving dribbling skills.

Conclusions. The results of this study are expected to provide a clear picture of the effect of speed and agility training on dribbling skills at the youth level. These findings can then be applied in the development of a more specific and focused training program, with the aim of improving the quality of each player's dribbling skills.

Introduction
The global history of soccer spans a considerable length (Villaseca-Vicuña, Jesam-Sarquis, et al., 2021). The origins of ball games akin to soccer can be traced back to ancient China during the Han Dynasty, approximately between 1122-247 BC (Abdulsalam et al., 2022). Historical records reveal depictions of people engaging in a form of soccer called "Tsu Chiu" in a book from the Chinese military of that era (Leite Junior & Rodrigues, 2020). The term "Tsu Chiu" translates to foot and ball,
referring to a leather ball filled with grass. Soccer has evolved into one of the most beloved sports globally, evident in the participation of 211 countries affiliated with FIFA (Federation International Football Association) (Gomtsian et al., 2017).

Present-day soccer has witnessed substantial advancements, transformations, and rapid progress encompassing physical fitness, playing techniques, strategic approaches, and the psychological aspects of players (González & Sánchez, 2018; Herly et al., 2022). This evolution is readily observable in live broadcasts of European cup matches and world cup qualifiers featuring European and Latin American teams (Conde-Pipo et al., 2023). The contemporary game emphasizes swift gameplay, refined techniques, exceptional individual skills, robust physical fitness, and artistic movements (Hardinata et al., 2023; Villaseca-Vicuña, Molina-Sotomayor, et al., 2021). The quick-paced play, technical finesse, and physical prowess demonstrated in these matches serve as benchmarks that Indonesian soccer can strive to emulate for its progression and robust development.

In the realm of soccer, dribbling transcends being a mere fundamental skill; it is an art that demands optimal speed and agility (Karo Karo et al., 2020; Ramirez-Campillo et al., 2021). Gaining a deeper comprehension of how specific exercises impact dribbling ability can yield valuable insights for coaches, players, and the formulation of soccer training programs (Doewes et al., 2020). This study zeroes in on factors such as speed and agility, given their pivotal role in determining a player's proficiency in mastering dribbling techniques (Karo Karo et al., 2020). Speed and agility can be concurrently honed, both with and without the ball. Soccer players constantly encounter diverse situations in every match, aspiring to execute graceful and rapid movements often infused with elements of speed and agility.

The primary aim of this research is to investigate the direct influence of speed and agility training on soccer dribbling skills. By unraveling this relationship, more tailored training programs can be devised to enhance effectiveness in outmaneuvering opponents and maintaining control of the ball (Crossley et al., 2020; Otte et al., 2020). This study seeks to analyze the impact of implementing speed and agility training on the development of dribbling skills in football. By adopting a holistic approach to these aspects, the study aspires to furnish concrete guidelines for players' skill development in navigating dynamic game situations.

The significance of this research lies in contributing to the scientific understanding of how speed and agility training can influence pivotal skills in soccer. Through an exploration of their impact, coaches and players can fine-tune their training regimens to place a greater emphasis on those aspects proven to have a substantial effect (Alficandra et al., 2021). By approaching this research comprehensively, it is anticipated that findings will emerge, opening avenues for the creation of more effective and efficient training methodologies. Furthermore, this research is poised to make a meaningful contribution to sports literature, serving as a crucial reference in the advancement of soccer player skills, particularly in the context of dribbling, which stands as a central element in the dynamics of the game.

Materials and Methods

Participants.

The population in this study was conducted by involving SSB U-16 Medan Satria students. Given the situation and conditions of a pandemic like this, it is not possible for school children to do it. The sampling technique used purposive sampling so that only about 20 children were obtained to be given treatment.

Research Design.

The research methodology employed in this investigation is an experimental approach that involves a comparison between two physical conditioning exercises: speed training and agility training, both of which target dribbling skills. The rationale behind selecting this research method is the researchers' desire to obtain precise results by conducting several tests, including a pretest (prior to the treatment) and a posttest (following the treatment).
The primary objective of this study is to assess the efficacy and outcomes of the administered treatment. The treatment regimen encompassed 60-meter sprint training and 40-meter shuttle run training conducted three times a week over a span of 6 weeks. The research instrument utilized for evaluation was the Loughborough Soccer Dribbling Test, which is in line with prior research (Kirkendall et al., 2008).

Figure 1. Loughborough Soccer Dribbling Test

Statistical analysis.

The data obtained were analyzed statistically through the stages of normality test, homogeneity test, and hypothesis testing. Data analysis was assisted using the SPSS 26 application.

Results

The implementation of speed training and agility training has a positive impact on students from SSB U-16 Medan Satria. In this study, the researchers aimed to attain precise outcomes through a series of tests, including the pretest (before the treatment) and the posttest (after the treatment). To assess the effects imparted, the initial step involved a prerequisite test stage to establish the hypothesis test to be used. According to the outcomes presented in Table 1, the Shapiro-Wilk normality test indicates a significance value (p > 0.05), signifying the normal distribution of the data.

Subsequently, the data from the speed training on soccer dribbling exhibited a significance value of 0.000 < 0.05. These findings substantiate that speed training significantly influences dribbling skills. Similarly, the results from agility training on soccer dribbling also displayed a significance value of 0.000 < 0.05, providing evidence that agility training significantly affects dribbling skills. These findings collectively indicate that both speed and agility exercises have a discernible impact on soccer dribbling skills, making them applicable contributions to soccer games. The detailed results are presented in Table 2.

Table 1. Normality Test Results

<table>
<thead>
<tr>
<th></th>
<th>Kolmogorov-Smirnova</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistic</td>
<td>df</td>
</tr>
<tr>
<td>Pretest Speed Training</td>
<td>0.133</td>
<td>10</td>
</tr>
<tr>
<td>Posttest Speed Training</td>
<td>0.183</td>
<td>10</td>
</tr>
<tr>
<td>Pretest Agility Training</td>
<td>0.220</td>
<td>10</td>
</tr>
<tr>
<td>Posttest Agility Training</td>
<td>0.170</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 2. Paired Sample Test Results

<table>
<thead>
<tr>
<th>Result</th>
<th>Lower</th>
<th>Upper</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair 1 Pretest Speed Training - Posttest Speed Training</td>
<td>0.46096</td>
<td>0.89704</td>
<td>7.045</td>
<td>9</td>
<td>0.000</td>
</tr>
<tr>
<td>Pair 2 Pretest Agility Training - Posttest Agility Training</td>
<td>0.57239</td>
<td>1.05561</td>
<td>7.621</td>
<td>9</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Based on the results of the homogeneity test, it provides information on the significance value of 0.780 > 0.05 where these results indicate that the data is homogeneous. After obtaining the same results, it can be continued using a different test to see the difference in the effect given. The results are shown in table 3.

The results in table 5 use Independent sample test to see the difference in the effect of speed and agility training on dribbling ability in soccer games. The results show a significance value of 0.000 < 0.05 which means there is a significant difference between speed training and agility on dribbling skills. These results provide information that speed training provides a better effect than agility training. This result can be seen based on the mean value using speed training (15.72) while the mean value of agility training (18.30). The results can be seen in table 5 and figure 2.

<table>
<thead>
<tr>
<th>Homogeneity Test</th>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result dribbling skills</td>
<td>Based on Mean</td>
<td>.080</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Based on Median</td>
<td>.042</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Based with adjusted df</td>
<td>.042</td>
<td>1</td>
<td>17.127</td>
</tr>
<tr>
<td></td>
<td>Based on trimmed mean</td>
<td>.058</td>
<td>1</td>
<td>18</td>
</tr>
</tbody>
</table>

| Table 4. Differential Test Results of Speed Training with Agility Training |
|-----------------------------|-----------------|------|-----|------|
| Result dribbling skills     | Equal variances assumed | F    | Sig. | t    | df  | Sig. (2-tailed) |
| Equal variances assumed     | 0.080            | 0.780| -7.938| 18  | 0.000 |
| Equal variances not assumed | -7.938           | 17.720| 0.000 |

| Table 5. Descriptive Results of Speed Training with Agility Training |
|-----------------------------|-----------------|------|------|------|------|
| Result                      | N   | Mean  | Std. Deviation | Minimum | Maximum |
| Speed Training              | 10  | 15.720| 0.68086       | 14.82   | 16.91   |
| Agility Training            | 10  | 18.307| 0.77266       | 17.24   | 19.80   |
| Total                       | 20  | 17.0145| 1.50361      | 14.82   | 19.80   |

**Figure 2.** Descriptive Results of Dribbling Skills with Speed and Agility Training
Discussion

This study aims to investigate the effect of speed and agility on dribbling skills in soccer. Results showed that speed training and agility training had a significant impact on dribbling skills in soccer. However, the results also provided additional evidence that speed training had a better effect than agility training. Through exercises focused on increasing running speed, a player can develop the ability to pass their opponents quickly. Execution speed while dribbling not only increases physical explosiveness, but also allows players to respond more efficiently to game situations (Wilson et al., 2020).

Agility training, such as drills and exercises that emphasize movement around the ball, plays an important role in improving dribbling ability. Good agility allows players to quickly change direction, trick opponents, and maintain control of the ball even in crowded situations (Moselhy, 2020). Therefore, players who undergo agility training regularly have the ability to overcome opponent pressure and retain the ball more effectively. A study provides evidence that agility and balance training has a significant effect on the success of dribbling speed (Yusuf et al., 2022).

Optimal dribbling skills in soccer often involve a combination of speed and agility (Padrón-Cabo et al., 2020). This statement is in line with the results of research showing that speed training and agility training contribute to the success of soccer dribbling. The application of exercises that combine these aspects can produce more complete players (Pambudi Rilo et al., 2021). Drills that emphasize short sprints, quick direction changes, and agility maneuvers around the ball are examples of exercises that can provide a thorough understanding of how to dribble effectively.

In addition to physical aspects, speed and agility training also contributes to improving players' ability to make decisions quickly (Wilson et al., 2020). Players who can move quickly and agilely have an advantage in choosing the best option when facing certain situations in the game. It is important to note that the implementation of speed and agility drills should be an integral part of a regular training program. These exercises can be adapted to meet the specific needs of players and positions within the team. Consistency in engaging these drills will ensure continued development in dribbling skills.

The greater the speed of a person, the faster the dribbling results, conversely the slower the speed of a person, the slower the dribbling results. Speed is one of the important factors that can affect movement. Speed is not only moving the whole body quickly, but can also be limited to moving the whole body in a short time. Speed can be seen in many activities in sports such as efficient footwork and rapid changes in body position. Someone who can move with fast and precise coordination means they have good speed which affects the results of dribbling skills.

Conclusion

The implementation of speed and agility drills in football training programs can significantly improve players' dribbling skills. By strengthening both physical and mental aspects, players can become more reliable in responding to game situations and maintaining control of the ball. Therefore, this training is key in shaping soccer players who are comprehensive and effective in real games. It is important to include speed and agility training in a regular training program to ensure continued development in dribbling skills. Improved dribbling skills at an individual level can also contribute positively to overall team performance, especially in terms of maintaining control of the ball and creating goal opportunities. Future research recommendations can combine with other variables so that they can influence the results of the study.

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Conflict of Interest And Funding

There is no conflict of interest.

References


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