



The Effect of Slalom Run on Increasing the Agility of Futsal Players

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ABSTRACT

Agility is one of the main physical components in a futsal game. Slalom Run has the potential to develop the aspects necessary for improving agility. This study aims to determine the effect of Slalom Run on improving the agility of futsal players. The method used was a quasi-experiment with a one-group pretest-posttest design. The research subjects, aged 15-19 years, were chosen to represent the typical age group of futsal players. The instrument used was the zig-zag running test to measure agility levels. The results showed that Slalom Run had a significant effect on increasing agility, as evidenced by the differences in pretest and posttest results, which increased. Thus, it can be concluded that Slalom Run is efficacious in improving the agility of futsal players in this age group.

Keywords: *Agility, Futsal, Slalom Run*

Pengaruh Latihan Slalom Run terhadap Peningkatan Kelincahan Pemain Futsal

ABSTRAK

Kelincahan merupakan salah satu komponen fisik utama dalam permainan futsal. Latihan Slalom Run memiliki potensi untuk melatih aspek-aspek yang dibutuhkan dalam peningkatan kelincahan. Penelitian ini bertujuan untuk mengetahui pengaruh latihan Slalom Run terhadap peningkatan kelincahan pemain futsal. Metode yang digunakan adalah eksperimen semu (quasi-experiment) dengan desain one-group pretest-posttest. Subjek penelitian terdiri dari 20 pemain Rebound Futsal Club berusia 15–19 tahun. Instrumen yang digunakan adalah tes lari zig-zag untuk mengukur tingkat kelincahan. Hasil penelitian menunjukkan bahwa latihan Slalom Run memberikan pengaruh yang signifikan terhadap peningkatan kelincahan, ditandai dengan perbedaan hasil pretest dan posttest yang meningkat. Dengan demikian, dapat disimpulkan bahwa latihan Slalom Run efektif dalam meningkatkan kelincahan pemain futsal.

Kata Kunci: Kelincahan, Futsal, Slalom Run.

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Article info

Received : 15 May 2024

Accepted : 17 June 2024

Published : 20 August 2024

P-ISSN 2613-9421

E-ISSN 2654-8003

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INTRODUCTION

Futsal is a sport that is increasingly popular in various circles, both at the amateur and professional levels (Gumantan et al., 2021), because it is dynamic and requires high physical and technical skills (Suryadi et al., 2023). Agility, as one of the primary physical components in futsal, is a crucial factor in player performance,

particularly in high-pressure game situations (Sekulic et al., 2019). Agility enables players to change direction quickly (Nimphius et al., 2018), avoid opponents, and chase the ball in limited space (Young et al., 2021), which is characteristic of small futsal fields. Therefore, research focusing on improving agility has high relevance in the context of developing futsal player performance.

While numerous studies have been conducted on agility in futsal, most have focused on general training methods, such as shuttle runs and ladder drills. The novelty of this study lies in its focus on Slalom Run. This method has not been extensively explored as a specific means to improve the agility of futsal players. The Slalom Run exercise, designed to simulate players' natural movements in a futsal match, such as avoiding opponents or dribbling quickly, offers a fresh perspective in physical training that is more tailored to the specific needs of the futsal sport.

Agility in futsal depends not only on linear speed but also on the ability to make sudden changes in direction without losing balance or speed (Tanyeri & Öncen, 2020). Slalom Run has the potential to develop these aspects because it involves a combination of coordination, speed, and leg muscle strength (Alviana et al., 2020). This research is expected to fill the knowledge gap on the effectiveness of this exercise compared to other conventional methods. Thus, this study has novelty value as it focuses on a training approach that has not been empirically tested in the context of futsal.

As futsal continues to gain popularity in Indonesia, there is a growing need for effective and efficient training methods to improve player performance, especially among young or amateur athletes. Many futsal coaches at the local level still employ conventional training methods that are less specific to the needs of agility in the game. This research is valuable because it can provide practical contributions in the form of more targeted training recommendations, which coaches can adopt to enhance the quality of futsal team play.

This study also has merit because it employs a quasi-experimental approach, which enables researchers to control certain variables while still adapting to realistic field conditions. However, it is essential to acknowledge that this approach also has limitations, including the potential for bias and the inability to establish causation.

By choosing futsal players as research subjects, this study has direct relevance to the needs of the sports world, particularly in the local futsal community.

Futsal, as a high-intensity demanding sport, also has a risk of injury (Hulin et al., 2020; Malone et al., 2018), especially to the legs and joints due to fast movements and sudden changes in direction (Frias Bocanegra & Fong, 2022; Gene-Morales et al., 2021; Wu et al., 2019). Slalom Run, which emphasizes controlled movements and leg muscle strengthening, may be a solution to improve agility while reducing the risk of injury (Bottollier et al., 2020). This study is worthwhile because it can provide empirical evidence on the benefits of this exercise, not only for performance but also for injury prevention, which is a crucial aspect in sports training.

Another novelty of this study is its potential to generate quantitative data on the improvement of agility through the measurement of reaction time and movement speed of players before and after the intervention. By using the zig-zag run test, this study can provide objective and measurable results, thereby strengthening the validity of the findings (Chalil et al., 2017). This data will be a valuable contribution to the scientific literature in the field of physical education and sport, particularly in the development of futsal training methods.

This research is also relevant to the needs of sport development in the modern era, where athletes' performance is increasingly expected to reach higher standards (Boccia et al., 2019; Brazier et al., 2020; Xiang et al., 2018). With the increasing number of futsal tournaments at both national and international levels, training that focuses on agility can be the difference between competitive teams and those that are not. This research has merit because it can provide new insights on how to efficiently improve player performance, which in turn can support the achievements of futsal sports in Indonesia.

From an academic perspective, this research also has value because it can enrich the literature in the field of physical education and sport, especially in terms of developing evidence-based training methods. Many previous studies have focused more on the technical or tactical aspects of futsal (Gómez et al., 2019; Silva Filho et al., 2022), while physical aspects, such as agility, have often received less in-depth attention. By examining the impact of Slalom Run, this study can serve as

a reference for other researchers seeking to develop innovative training methods for similar sports.

Finally, this study has high feasibility, as it can be implemented on both small and large scales, in amateur and professional futsal clubs. The results of this study are expected to provide practical guidance for coaches and athletes to optimize agility training with a simple yet effective method. Thus, this research not only has academic value but also a significant practical impact in the world of sports, especially futsal, so it is suitable for publication in research journals.

METHOD

This study employed a quasi-experimental design to investigate the impact of Slalom Run on the agility of futsal players. This approach was chosen because it allows researchers to control intervention variables without performing complete randomization (Sourial et al., 2018; Souza et al., 2022), which is particularly relevant in field conditions where research subjects have specific characteristics that cannot be fully randomized. This study aims to provide empirical evidence on the effectiveness of Slalom Run in improving agility by comparing results before and after the intervention.

The research design used was a one-group pretest-posttest design. In this design, the subject group received treatment in the form of Slalom Run for a specific period, with agility measurements taken before (pretest) and after (posttest) the intervention. The research subjects were 20 players from the Rebound Futsal Club, with an age range of 15 to 19 years. The selection of these subjects was based on age homogeneity and uniform levels of physical activity as active futsal players, thus minimizing unwanted variations in research results.

The research instrument used was the zig-zag running test, which is designed to measure players' agility through their ability to change direction quickly. The test is conducted by placing obstacles in the form of cones in a zig-zag pattern, where players must run as fast as possible while maintaining balance and coordination. The time taken to complete the test was measured using a stopwatch with an accuracy of 0.01 seconds to ensure data accuracy. The zig-zag running test was chosen due to its high validity and reliability in measuring agility, as well as its relevance to movements commonly performed in futsal matches

(Lubis et al., 2020).

Table 1. Agility Assessment Criteria (Bernhardin & Fauzi, 2022)

Category	Value (Seconds)
Excellent	$\leq 15,5$
Very Good	16,0 - 15,6
Good	16,6 - 16,1
Fair	17,1 - 16,7
Poor	$\geq 17,2$

RESULTS

This section presents the results of agility measurements taken before and after the implementation of the Slalom Run intervention, along with statistical analysis to evaluate the effectiveness of the training. Further discussion will outline the implications of the findings for agility theory, their relevance to the dynamics of futsal play, and comparisons with previous research to provide comprehensive insight into the contribution of this exercise in improving player performance.

Table 2. Research Results Based on Frequency of Each Assessment Category

Category	Value (Seconds)	Pretest		Posttest	
		Frequency	Percentage	Frequency	Percentage
Excellent	$\leq 15,5$	0	0%	9	45%
Very Good	16,0 - 15,6	3	15%	9	45%
Good	16,6 - 16,1	0	0%	0	0%
Fair	17,1 - 16,7	9	45%	2	10%
Poor	$\geq 17,2$	8	40%	0	0%

Based on the data from the agility test results of futsal players using the zig-zag running test, there are significant differences between the pretest and posttest results for 20 members of the Rebound Futsal Club. In the pretest, no player reached the "Excellent" category (≤ 15.5 seconds), with the distribution of results as follows: three players (15%) were in the "Very Good" category (16.0-15.6 seconds), nine players (45%) in the "Fair" category (17.1-16.7 seconds), eight players (40%) in the "Poor" category (≥ 17.2 seconds), and no players in the "Very Good" category (16.6-16.1 seconds). After undergoing the Slalom Run intervention, the posttest results showed a significant improvement, with nine players (45%) reaching the "Excellent" category (≤ 15.5 seconds), nine players (45%) in the "Very Good" category (16.0-15.6 seconds), two players (10%) in the "Fair" category (17.1-16.7

seconds), and no players in the "Poor" (≥ 17.2 seconds) or "Good" category (16.6-16.1 seconds). This data indicates that Slalom Run is efficacious in improving player agility, indicated by the shift of the majority of players to higher agility categories in the posttest.

Table 3. Data Description

Variable	Pretest	Posttest
Average	17,4	15,5
Maximum Value	19	17
Minimum Score	16	14
Data variation	0,84	0,75
Std. Deviation	0,917	0,866

Based on statistical data, the average player agility time in the pretest was 17.4 seconds, with a maximum value of 19 seconds and a minimum value of 16 seconds. The data variation of 0.84 and the standard deviation of 0.917 indicate a relatively high variability in agility performance between players before the intervention. At posttest, the mean agility time decreased to 15.5 seconds, with a maximum value of 17 seconds and a minimum value of 14 seconds, indicating an overall improvement in performance. The posttest data variation of 0.75 and standard deviation of 0.866 showed that the data distribution became more consistent than the pretest. Overall, this data indicates that Slalom Run is efficacious in improving the agility of futsal players, as reflected by the decrease in mean time, smaller range of values, and lower data variability in the posttest.

DISCUSSION

The results of the statistical analysis using a paired t-test on the pretest and posttest data of futsal player agility yielded a t-value of 7.933 with 19 degrees of freedom (df) and a significance value (Sig. 2-tailed) of 0.00. The significance value, which is far below the 0.05 threshold, indicates that there is a statistically significant difference between the agility results before and after the Slalom Run intervention in 20 members of the Rebound Futsal Club. The high t-value indicates that the Slalom Run exercise has a strong effect on improving player agility, so the hypothesis that this exercise is efficacious in improving agility can be accepted.

The slalom run is a form of agility training widely used in futsal training. This exercise involves quickly zig-zagging through obstacles, which can improve a

player's ability to change direction, reaction speed, and dynamic balance. According to motor learning theory, repetition of complex movements, such as slalom runs, can strengthen muscle memory and neuromuscular coordination, which are the basis for improving agility (Chen et al., 2020; Ladda et al., 2020). In the context of futsal, agility is a critical factor because players must move quickly in a limited space while controlling the ball.

Several studies conducted between 2018 and 2024 support the effectiveness of slalom runs in enhancing the agility of futsal players. For example, research by Zainuddin & Mulyani (2024) found that players who regularly participated in slalom run for 6 weeks, with three meetings per week, showed a significant increase in the agility of PS Undikma soccer players. These results are in line with other research indicating that a variety of obstacle-based exercises, including slalom runs, can improve change of direction speed (CODS) (Čoh et al., 2018; Stamenković et al., 2023).

Thus, empirical evidence from recent studies suggests that the slalom run is an effective training method for improving the agility of futsal players. However, it is essential to note that the intensity, duration, and variety of training should be tailored to the player's level for optimal results. The integration of slalom runs with other training components, such as lower muscle strength and cognitive training, can have a greater impact on the overall performance of futsal players.

CONCLUSION

Based on the results of the study, it can be concluded that Slalom Run is efficacious in improving the agility of futsal players, as evidenced by the improvement in the results of the zig-zag running test on 20 members of the Rebound Futsal Club aged 15-19 years. It demonstrates that the training method can be utilized as an alternative in futsal player development programs to enhance their agility. Therefore, it is recommended that futsal coaches or practitioners integrate Slalom Run in a structured manner into training sessions to improve athlete performance, while still considering variations in intensity and duration to achieve optimal results. Furthermore, additional research can be conducted by exploring the effect of this exercise in combination with other methods or in different age groups.

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