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The Effect of the Combination of ABC Running Drill and Hexagon Drill Exercises on Increasing the Agility of Men's Futsal Athletes

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Abstract

Agility is a very important physical component in futsal, where the ability to change direction quickly and accurately determines the performance of athletes on the field. This study aims to determine the effect of the combination of ABC Running Drill and Hexagon Drill exercises on increasing the agility of male futsal athletes. This study uses an experimental design with a pre-test and post-test approach. The study population was male futsal athletes from Al Azhar 5 Islamic High School Cirebon with a sample of 15 athletes. Agility was measured using the Agility T-Test before and after the intervention in the form of a combination of ABC Running Drill and Hexagon Drill exercises for six weeks with 2 meetings per week. The data were analyzed using the Shapiro-Wilk normality test. The results showed a significant increase in agility with a decrease in the average travel time from 13.48 seconds in the pretest to 10.90 seconds in the posttest (difference of 2.58 seconds). All study subjects who were initially in the "poor" category (>12.5 seconds) experienced an improvement in performance with a posttest time range between 9.61-11.84 seconds. The data had a normal distribution based on the Shapiro-Wilk test (p-value > 0.05) and showed a decrease in standard deviation from 5.62 to 3.59, indicating an improvement in performance consistency between athletes. The combination of ABC Running Drill and Hexagon Drill exercises has proven to be effective in significantly increasing the agility of male futsal athletes. This training method can be implemented as an effective training strategy to develop the agility skills of futsal athletes, especially for athletes with low initial agility performance.

How to Cite

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INTRODUCTION

In the last twenty years, futsal has experienced an increase in popularity and developed into an amazing sport, attracting the attention of a huge TV audience (Maurer, n.d.). In the past, futsal players also took part in football competitions, but now they focus on the sport, and elite clubs recruit professional players. As a result, the technical and tactical level of the game continues to evolve. Conversely, since football involves fast movements with or without the ball as well as without a fixed position, in a number of countries (i.e., Brazil and Spain) football coaches utilize the sport to improve the technical and tactical skills of players (The Football Association, 2008).

Fast action that occurs during an invasion match such as futsal can be classified as requiring elements of straight sprints (acceleration and maximum speed) as well as agility(Little & Williams, 2005) In addition, the reduced field difference and frequent substitutions during futsal matches require quick decision-making and high sprint ability under pressure during the attacking and defensive phases, Although straight running speed is considered an important quality in many sports, the ability to perform rapid full-body movements with changes in speed or direction in response to stimuli, known as agility (Sheppard & Young, 2006) Then according (Little & Williams, 2005) shows that in professional professional players, acceleration and maximum speed share only 39% of the general variance with agility, which has 50%, that 6 weeks of straight training and decisive agility in soccer players a significant selective mode-specific increase but limited transfer from one mode to another.

According to (Gumantan & Fahrizqi, 2020) futsal is a type of sport similar to football and is carried out on a smaller field, futsal is a complex sport where mastery of basic techniques and physical abilities play an important role in supporting the performance of futsal athletes, if the skills are good but the physique is bad, then the maximum ability will not be achieved. Basic futsal techniques that need to be mastered include dribbling, passing, and shooting. In addition, physical components such as speed, agility, strength, and endurance play a very important role for a futsal athlete(Barasakti, 2019)

ABC running training is a systematic training program that aims to develop agility, stability, and movement synchronization in athletes, especially Futsal players, through improving footstep techniques and body posture. This exercise consists of exercise A (knee lift and posture), exercise B (leg extension and coordination), and exercise C (foot placement and contact with the ground). These exercises develop explosiveness, stability, and movement efficiency, which are essential for rapid acceleration, rapid changes of direction, and better balance. Incorporating ABC running exercises into regular training improves performance, injury prevention, and overall movement skills in Futsal players (Selvakumar, 2025)

Athletic Basic Coordination, or better known as ABC running, in Indonesian refers to the basic exercise of athletic movement coordination. This exercise includes a number of movements, such as walking, running, jumping, as well as abilities that link body awareness and coordination between eyes and hands, as well as between eyes and feet. ABC Running Drill is a fundamental exercise that athletes must perform, especially in sports that require speed, since it involves any type of movement on the legs or legs, ABC exercises (agility, balance, coordination) can have an impact on various other physical and cognitive aspects such as cardiorespiratory capacity, motor skills, increased focus and concentration, and communication skills (Vandoni et al., 2024).

The hexagon drill method is an agility training technique designed to evaluate the speed at which the legs move in various directions including backward, forward, and lateral movements. In addition to these functions, this exercise acts as an exercise to test the body's ability to maintain balance when making a high-tempo directional transition. The hexagon drill exercise consists of an equilateral hexagonal line with a length of 61 cm and the size of each angle is 120° (Saputra, 2021) When performing the hexagon drill, flexibility and concentration are needed because you change direction while jumping with both feet.

Hexagon drill is a form of agility exercise designed to develop the speed of leg movement in various directions of movement, including backward, forward, and lateral (sideways) movements. This exercise not only serves to improve the ability to change direction quickly, but also acts as a training method to develop the body's ability to maintain stability and dynamic balance when transitioning movements at high speed (Pratama et al., 2023)

Hexagon Drill is a variation of agility training that is performed on a hexagonal path, aiming to improve speed as well as the skill of changing direction. This activity can be changed by adjusting the length of the track to 1.67 yards per session, carried out 12 times, so that the total distance traveled in one series reaches 20 yards (M. Nasution, 2021)

In general, hexagon drill exercises are often used to increase the agility of table tennis

and basketball athletes. Theoretically, researchers have not found that hexagon drill training is applied to futsal. Based on the results of observations, researchers found that some players lost their balance when changing direction to chase the ball so that players could not control and control the ball properly, which led to a loss of scoring opportunities both during practice and matches. In this study, the researcher offers a hexagon drill training model to provide solutions to problems that occur in futsal athletes of Al Azhar 5 Islamic High School Cirebon. The researcher is interested in researching the effect of the combination of Abc running drill and hexagon drill exercises on increasing the agility of futsal athletes. When hexagon drills are performed regularly by athletes three times a week for four weeks, the stretching reflex becomes stronger. This causes an increase in energy during the concentric phase and contributes to an increase in the agility of futsal players (Hemphill, 2017)

Agility and coordination are key elements in athletic performance that allow athletes to move quickly and effectively while still having complete control over their body movements. Agility is defined as the ability to quickly and accurately change the direction of movement in response to the stimulus received, while coordination includes the harmonious integration of various movement systems to create efficient and effective movement patterns in achieving a specific movement goal (Selvakumar, 2025)

Agility is a person's ability to move quickly while effectively changing the direction of movement without losing balance. This ability is essential in a variety of physical activities, especially sports that require quick reactions and sudden changes of direction, such as futsal, badminton, or basketball. The agility of futsal players can be improved through training that is carried out consistently, full of commitment, and accompanied by a planned and continuous training program. Some types of exercises that are effective in improving the agility of soccer players, including futsal, are zig-zag runs, which train the ability to change direction quickly, and shuttle runs, which help improve the speed and responsiveness of movements (Mawardi, 2021)

One of the biomotor elements that is very crucial in futsal is agility, which is directly related to the efficiency of the movements made while playing. The quality of individual agility is seen as an important element in improving the efficiency of various tactical actions, especially in increasing effectiveness in sports involving teams. Agility in futsal includes the ability to adapt quickly to changes of direction, as well as involving body coordination, dynamic balance, and accurate motor responses to ever-changing game situations. Very agile futsal players can make evasive movements to escape from opponents, master dribbling with good ball control, and make quick transitions between defensive and attacking positions (Primadi et al., 2021).

Futsal as a sport that requires high speed and limited playing area requires maximum agility skills from its players. Agility is a determining factor in the success of futsal players' performance, especially to change direction quickly, avoid opponents, and create opportunities to score goals. Speed is the ability to move from one location to another in the fastest time However, in its implementation, a number of problems are still found(Herlambang et al., 2022), including most agility training programs for futsal players still apply traditional methods that are boring and have minimal variety. As a result, adjustments to training are slow and skill improvement is less than optimal, Based on observations on the field, there are still many male futsal athletes who show substandard agility levels, which can be seen from the slow reaction when changing the direction of movement and the lack of coordination when performing maneuvers, Although these two training methods have been proven to be effective separately, there has been no scientific research exploring the combined effectiveness of the two in increasing the agility of male futsal athletes.

This study aims to determine the effect of the combination of ABC Running Drill and Hexagon Drill exercises on increasing the agility of male futsal athletes in Al Azhar Islamic High School. Through an experimental approach, this study will analyze the effectiveness of structured training programs in developing agility skills which are an important component in the game of futsal.

Previous research entitled "The effect of running ABC training on agility and coordination among football players" discussed the effect of ABC running training on football, especially on agility and coordination (Selvakumar, 2025) The novelty of this study lies in the systematic combination of ABC Running Drill and Hexagon Drill which is specifically applied to futsal athletes, considering that previous research only examined the two methods individually or in different sports, The combination of these two techniques is based on the characteristics of the game of futsal that requires multidimensional agility, where ABC Running Drill focuses on improving basic movement coordination as well as linear speed, while Hexagon Drill trains the ability to change direction .

METHODS

This study uses a quantitative approach with an experimental method to test the effect of agility training on the performance of futsal athletes. The population in this study is all futsal players of Al Azhar Islamic High School 5 Cirebon City which totals 15 people. The selection of this population was based on the results of preliminary observations that showed that the players experienced limitations in terms of agility during matches on the field, especially in making quick and effective changes of direction when facing the opposition's pressure.

The sampling method applied is total sampling, where the entire population is used as a research sample. The selection of this method was based on the consideration that the number of populations was quite limited and uniform, making it possible to involve all members of the population in the study. The research design applied is Two-Group Pretest Posttest Design. The Two-Group Pretest Posttest Design was chosen because it allows researchers to compare the initial (pretest) and final (posttest) conditions in both groups, so that they can identify differences in the effect of treatment objectively. There is an initial test before being given treatment, the treatment can be found more accurately and by comparing the condition before after being given treatment with the following pictures:

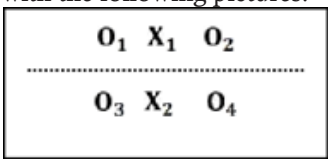

Image caption :
O1 : Pre Test (Test Awal Agility Tee Test)
X1 : Treatment (Abc Running Drill)
O2 : Post Test (Test Akhir Agility T Test)
O3 : Pre Test (Test Awal Agility T Test)
X2 : Treatment (Hexagon Drill)
O4 : Post Test (Test Akhir Agility T Test)

The instrument used in this study is BlazePod technology, which is a training pod system equipped with LED sensors and reactive technology to measure agility ability objectively and accurately. The measurement configuration used 6 BlazePods placed in a test T formation where the 4 main pods formed a standard T pattern (starting pod, front center pod 9.14 meters, left and right pods 4.57 meters each from the center pod), as well as 2 additional pods placed as a reactive stimulus variation.

RESULTS AND DISCUSSION

The results of the data analysis were used to provide a comprehensive overview of the effectiveness of the agility training program that has been carried out on futsal players of Al Azhar 5 Islamic High School Cirebon. After six weeks of treatment in the form of ABC Running and Hexagon Drill exercises, the results of the Agility T-Test measurements using BlazePod technology showed significant performance changes in all study subjects.

Table 1. T-Test performance classifications

Ranking	Male	Female
Excellent	<9.5	<10,5
Good	9,5-10,5	10,5-11,5
Average	10,5-11,5	11,5-12,5
Poor	>11,5	>12,5

Table 1. T-Test performance classifications for young male athletes: excellent (<9.5 seconds), good (9.5-10.5 seconds), average (10.5-11.5 seconds), below average (11.5-12.5 seconds), and poor (>12.5 seconds). Meanwhile, young female athletes have different scoring standards: excellent (<10.5 seconds), good (10.5-11.5 seconds), average (11.5-12.5 seconds), below average (12.5-13.5 seconds), and poor (>13.5 seconds). These differences in classification are due to different physiological and anthropometric factors between genders, including differences in muscle mass, height, stride length, and neuromuscular characteristics that affect acceleration ability and changes of direction.

Table 2. The results of the Agility

Name	Pretest	Posttest
SA	13,5	11,7
SDN	13,28	11,22
Mf	12,42	11,79
HH	13,51	10,48
YL	12,61	10,15
BU	12,1	10,09
EB	12,6	11,55
FH	13,1	10,63
AA	14,28	11,84
IH	13,69	10,09
IHS	14,21	11,76
KI	14,69	11,28
BN	12	9,61
AH	12,61	10,2
FS	14,43	11,23

Table 2. The results of the Agility T-Test measurement in the futsal athletes of Al Azhar 5 Cirebon Islamic High School showed a significant difference in performance in the pretest phase. Initial data showed a range of travel time from 12.00 seconds (the highest value) to 14.69 seconds (the lowest value), with a difference of 2.69 seconds indicating variability in agility among the study participants. According to the T-Test standard classification for adolescent male athletes, all subjects fell into the "poor" category (>12.5 seconds) in the pretest phase, suggesting that early agility requires a structured intervention.

After the implementation of the ABC Running and Hexagon Drill training programs for six weeks, the posttest results showed a significant improvement in performance. The highest value reached 9.61 seconds while the lowest value was 11.79 seconds, with a range of increases from 2.39 to 2.90 seconds for each individual. This increase is practically significant, where the best-performing individual makes it to the "excellent" category (<9.5 seconds), while the lowest-performing individual moves up to the "below average" category (11.5-12.5 seconds)

Comparative analysis revealed an average increase in travel time by 22-25%, which is a strong indication of the success of the training program implemented. These improvements demonstrate the best neuromuscular adaptation, including improved coordination between muscles, efficiency of movement patterns, and reactive agility abilities that are important in futsal. These findings provide empirical evidence that the combined ABC Running and Hexagon Drill exercises can result in a positive transfer in multi-directional agility capabilities in a relatively short period of time

Based on the results of the research that has been conducted. The researcher will display the data systematically. This data is in the form of a description of pre-test and post-test results, normality test result data, homogeneity test result data, and t-test result data. Data from the results of the pre-test and post-test will be presented by the researcher in **Table 3**.

Table 3. Description of Pretest and posttest Agility T test results

Description	Pretest	Posttest
N	15	15
Highest	12.00	9.61
Lowest	15.38	11.84
Mean	13.48	10.90
Median	12.61	10.76
Mode	14.69	11.84
Standard Deviation	5.62	3.59

Table 3. indicates that the N value or the number of samples is 15. The minimum score of the pretest is 15.38 and the posttest is 11.84, the maximum score of the pretest is 12.00 and the posttest is 9.61, the average score or average of the pretest is 13.48 and the posttest is 10.90, the median score or average value of the pretest is 12.61 and the posttest is 10.76, The mode value or the value that often appears pretest is 14.69 and the posttest is 11.84, and the standard value of the deviation of the pretest is 5.62 and the posttest is 3.59.

Normality tests are carried out to find out whether the data distribution is normal or not. The normality test used Shapiro Wilk with the help of SPSS version 24. The data is said to have a normal distribution if the significant value is more than 0.05 or Sig. (2-tailed) > 0.05 and if it is less than.

Table 4. Tests of Normality

Test	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	.154	15	.200*	.944	15	.439
Posttest	.192	15	.141	.897	15	.086

Table 4. The results of the normality test with two statistical methods, namely Kolmogorov-Smirnov and Shapiro-Wilk, were used to check whether the pretest and posttest data of the Agility T-Test in the futsal players of Al Azhar 5 Cirebon Islamic High School were distributed normally or not.

Kolmogorov-Smirnov Test Analysis: The pretest results showed a statistical value of 0.154 with a degree of freedom of 15 and a significance value of 0.200, while the results of the posttest showed a statistical value of 0.192 with a degree of freedom of 15 and a significance value of 0.141. Both significance values are higher than alpha 0.05, which indicates that the pretest and posttest data are normally distributed.

Shapiro-Wilk Test Analysis: For the pretest data, the Shapiro-Wilk statistical value was recorded at 0.944 with a significance of 0.439, while for the posttest data the statistical value was 0.897 with a significance of 0.086. By paying attention to the relatively small sample size (n=15), the Shapiro-Wilk test becomes more sensitive and precise in detecting data normality. The significance values obtained (0.439 and 0.086) were

above 0.05, so it can be concluded that the data has a normal distribution.

This study is titled "The Effect of the Combination of ABC Running Drill and Hexagon Drill Exercises on Improving Agility of Male Futsal Athletes" which examines the combined efficiency of two types of training in improving the agility of futsal athletes, which is one of the important elements in a game that requires limited space and a rapid change of direction. In accordance with the purpose of this study, which is to determine the impact of the combination of ABC Running Drill and Hexagon Drill exercises on agility improvement, the results of the study show that the six-week training program is able to significantly improve agility performance. This can be seen from the decrease in the average time needed from 13.48 seconds in the pretest to 10.90 seconds in the posttest. All participants who were initially in the "rich" category according to the Agility T-Test classification, showed improvement and moved to a better category.

These results indicate that the combination of the two exercise models has a significant positive effect on increased agility. The ABC Running Drill exercises contribute to the development of basic movement coordination, posture maintenance, and increased linear speed. As revealed by (Selvakumar, 2025), this activity succeeded in improving coordination skills and agility in football players. Meanwhile, the Hexagon Drill is an exercise that emphasizes quick reactions and the ability to move quickly in directions, keeping keseimbangan tubuh yang dinamis (Pratama et al., 2023); (Saputra, 2021).

These two exercises, when combined, can meet the special demands in futsal, namely agility in various directions which includes coordination, sudden changes of direction, and body stability when facing pressure from opponents. (Sheppard & Young, 2006) states that agility is not only about running speed, but also involves the integration of the neuromuscular system in responding to game stimuli. Thus, exercises that bring together elements of coordination and reaction movements such as ABC Running and Hexagon Drill are essential for improving the agility of futsal players. In addition, the information in this study showed a consistent and normal distribution, which added to the validity of the results. According to (Yagin, 2024), a balanced and normal distribution of data shows that variation in performance is not caused by individual extreme fluctuations, but rather is a general impact of treatment. As a result, the progress made reflects the effectiveness of the training program that is structured in a planned manner.

In addition, the results of this study also fill in the gaps in the existing literature. If in previous studies such as (Mawardi, 2021) and (Barasakti, 2019), agility exercises were carried out separately, then in this study they actually combined two exercise models in one intervention. This is what makes this research unique, as well as providing a more comprehensive training approach. In other words, the findings of this study offer practical implications for futsal coaches to apply the combination of ABC Running Drill and Hexagon Drill exercises as an effective and efficient training strategy in improving athletes' agility, especially for those who have limited basic agility skills. The program has been shown to significantly improve performance in a relatively short time and consistently among all participants.

CONCLUSION

Based on the findings of the study on the impact of the combination of ABC Running Drill and Hexagon Drill exercises on improving the agility of men's futsal athletes, there are several significant conclusions that can be drawn:

The T-Test Agility norm is a standard for measuring agility that uses travel time in seconds as an indicator of performance, where lower travel times indicate better agility. This norm is differentiated by gender taking into account natural physiological differences, where for men the category "Excellent" (<9.5 seconds) reflects elite/professional status, "Good" (9.5-10.5 seconds) for semi-professional athletes, "Average" (10.5-11.5 seconds) for individuals who actively exercise, and "Poor" (>11.5 seconds) requires an intensive training program. As for women, the criteria for each category were added 1 second, namely "Excellent" (<10.5 seconds), "Good" (10.5-11.5 seconds), "Average" (11.5-12.5 seconds), and "Poor" (>12.5 seconds), which showed differences in body composition, muscle mass, neuromuscular characteristics, and anatomical structure between men and women. In futsal research, this norm serves as a basic assessment for recognizing the athlete's initial ability, setting realistic improvement targets, and monitoring the progress of training.

The changes in agility performance that occurred showed a very meaningful and consistent transformation among all the study subjects. Initial circumstances showing all athletes were in the "poor" group (>12.5 seconds) in the pretest phase have shown a significant increase in the posttest phase, where none of the subjects remained in that lowest category. The range of travel time that showed a significant improve-

ment from the initial condition of 12.00-14.69 seconds to 9.61-11.84 seconds at the end of the intervention indicated an improvement in performance that was not only statistically significant, but also practically significant with a difference in improvement of up to 2.58 seconds on the average group. The consistency of the improvement that occurred across the study subjects without exception suggests that the combination of ABC Running Drill and Hexagon Drill exercises has credible effectiveness in developing the agility abilities of male futsal athletes, while also proving that an organized training program can improve athletes' performance from low to competitive standards in a relatively short period of time

The findings of this study offer significant practical implications for futsal coaches in developing agility training programs, where the combined approach of ABC Running Drill and Hexagon Drill can be applied as an efficient training method to develop athletes' agility skills, especially for athletes who have early agility performance in the low category. Based on the results of the study, it is recommended for futsal coaches to apply this combination of exercises in their daily training program with a planned frequency and intensity, as well as to conduct periodic evaluations using the Agility T-Test to monitor the progress of improving the athlete's agility. Advanced study with A larger sample, longer training duration, and variation of control groups could be performed to improve the external validity of these results as well as explore the possibility of applying combination training methods in other sports.

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