Jurnal Pendidikan Jasmani (JPJ)
Vol. 7, No.1, July 2026
ISSN: 2723-2816 (Online)

The Effectiveness Of The Cone Drill Training Method To Increase Speed In Futsal Athletes At Mts Darut Taqwa 02 Purwosari Pasuruan

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Abstract
The decline in performance and the decline in speed ability are the main factors for the MTs Darut Taqwa 02 Purwosari Pasuruan futsal team. Speed is an important biomotor component in futsal that requires fast rotation on the futsal field. Purpose: This study aims to determine the effectiveness of the cone drill training method with X-Pattern Multiskill variations to increase speed with a 20-meter sprint test on futsal players. Method: This type of research uses an experiment with a one-group pretest-posttest design. The research sample consisted of 10 students selected using a purposive sampling technique. The instrument used was a 20-meter sprint test. Data were analyzed using descriptive tests and Paired Sample T-Test tests with the help of SPSS 25. Results: The results showed a decrease in the average travel time from 3.68 seconds in the pretest to 3.41 seconds in the post-test. The results of the Paired Sample T-Test obtained a t-count value of 16.082 > t-table 2.262 and a significance value (Sig. 2-tailed) of 0.000 < 0.05. Conclusion: It can be concluded that cone drill training is effective and can significantly increase the speed of futsal players at MTs Darut Taqwa 02 Purwosari Pasuruan. This increase is driven by the adaptation of the neuromuscular system and synchronization of motor units through structured training patterns.
Keywords: *Cone Drill, Speed, Futsal*

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INTRODUCTION

In everyday life, human activity cannot be separated from sports, as the scope of sports is also broad. Playing soccer can be considered a sport, and running is also a sport (Santoso 2016).

Not only is playing technique an important element in futsal, another element is the physical condition of the players. This is one of the keys to success for players to be able to play well and even win matches. This is supported by the statement made by (T. O. Bompa and Haff, 2009) who stated that because of the importance of physical condition, a training process is necessary. This is because the goal of training is to train and improve the physical condition of players. There are several components of physical condition, the following

components are explained by Sceunemann in Ismoyo (2014): 1) speed, 2) strength, 3) endurance, 4) flexibility, 5) accuracy, 6) power, 7) coordination, 8) reaction, 9) balance, 10) agility.

Futsal is a high-intensity sport that demands complex biomotor skills, where transitions between attack and defense occur in a matter of seconds. In the dynamic nature of the game, which takes place on a relatively small field, speed is the primary focus that differentiates superior players from average ones. Athletes are not only required to run straight lines during the game but also to be able to rotate positions to accommodate the coach's instructions.

Researchers conducted an observational study of students in the futsal extracurricular activity at MTs Darut Taqwa 02 Purwosari Pasuruan Purwosari. They learned that the school's futsal extracurricular activities had experienced a decline in performance since 2022.

Due to findings from previous observations, the researchers conducted a 20-meter sprint test prior to the study and found that the speed results were below average. Therefore, the researchers felt the need for analysis and efforts to improve the speed of students participating in the futsal extracurricular activity at MTs Darut Taqwa 02 Purwosari Pasuruan Purwosari through the Cone Drill method. This activity aimed to obtain information on the students' speed abilities. Furthermore, these results can be used as evaluation material for coaches to improve the performance of futsal extracurricular students.

The Cone Drill method is a training method used to measure speed and agility. Cone Drill can also be defined as a training exercise that uses a cone-shaped object as a marker or benchmark (Brown and Ferigno 2005). Through this training method, athletes are accustomed to quickly moving toward the cone and changing movements toward the next cone. Cone drill exercises can be used as an effective method to improve player ability and speed through muscle contractions with rapid movements and changes in movement (Nurhasan, 2007).

On this occasion, the researcher used the X Pattern Multiskill Cone Drill, because this exercise requires students to make three quick and precise position changes when running at high speed, namely sprinting, backpedal running, and shuffle running to hone students' speed.

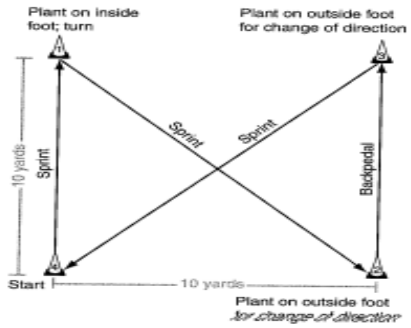

Figure 1. X Pattern Multiskill Cone Drill

The X Pattern Multi-Skill drill uses a field bordered by four cones, marking the area, with a total distance of 20 yards. Each cone is 5 yards apart and two 5-yard diagonal lines form an X. The X Pattern Multi-Skill drill begins with the signal "go" or whistle. Students then run from the first cone for 5 yards, then diagonally to the third cone for 5 yards, then straight to the fourth cone for 5 yards, and finally diagonally back to the first cone for 5 yards.

The procedure for implementing the X Pattern Multi-Skill cone drill, according to Brown, L. E., & Ferrigno, V. A. (2014) in Training for Speed, Agility, and Quickness, is as follows:

a. Start: Begin at the bottom left cone (1).

b. Diagonal Sprint: Sprint diagonally toward the top right cone (2).

c. Lateral/Side Step: Run sideways (shuffling) towards the upper left cone (3).

d. Diagonal Backpedal/Sprint: Run diagonally towards the lower right cone (4).

e. Lateral/Side Step: Run sideways back to the starting position at the lower left cone (1).

A student's physical fitness can be influenced by several factors, as can the physical fitness of futsal athletes. One of these factors is speed. Nurhasan et al., 2017, explained that speed is an individual's ability to perform body movements as quickly as possible. Speed itself has two indicators: reaction speed and flexibility (Harsono, 2018). This opinion is supported by the statement (T. Bompa and Buzzichelli, 2015), which states that to reach maximum speed, a training intensity of 60% to 70% is required.

Players/individuals will reach their maximum speed after accelerating for at least 20 meters, as this maximum speed cannot be achieved immediately (Harsono, 2018). An athlete can maintain their maximum speed for a distance of 60 meters. Each sprint repetition that has reached the maximum speed requires a fairly long rest period, which is held until the pulse rate drops to 100 beats per minute, with a work:rest ratio of 1:5 to 1:10.

Regarding the factors that determine running speed, (Pate et al., 1993) suggested that anaerobic capacity and speed are determined by the following factors:

a. Muscle fiber type and distribution of fast-twitch (FT) and slow-twitch (ST) fibers
b. Neuromuscular coordination
c. Biomechanical factors (e.g., skill)
d. Muscle strength.

Speed is influenced by the athlete's motor skills, specific strength, endurance, and technique. According to T. O. Bompa and Carrera (1999), the factors that influence speed are:

a. Heredity
b. Reaction time
c. Ability to overcome external resistance
d. Technique
e. Concentration and enthusiasm
f. Muscle elasticity.

METHOD

This research used an experimental design method. The study was conducted on futsal extracurricular students at MTs Darut Taqwa 02 Purwosari Pasuruan. The study period was three weeks and included 16 training sessions. The sampling process used by the researcher was purposive sampling. Ten futsal extracurricular students served as the research sample.

Two aspects of the research instrument must be considered: validity and reliability. Validity refers to the instrument being considered to be truly used for measurement, and reliability refers to the instrument producing consistent measurement results, even if the instrument is used repeatedly. To measure the results of cone drill training to improve speed in futsal extracurricular activities, the following speed test steps were taken by test participants:

1. 20-meter sprint speed test

   Purpose: To measure speed

   Equipment/facilities: Stopwatch, cones, whistle, stationery, and tape measure

   Implementation:

   a. The research sample was given the task of running a 20-meter distance.
   b. The time recording process begins at 1/10th of a second (0.1 second), but can be done at 1/100th of a second (0.01 second) if possible.
   c. The test is run twice, with the best running speed being calculated.

Table 1. Speed Test Norms

Category	Time Span (Seconds)	Interpretation
Very Good	< 3.00	Very Fast (Potential Athlete)
Good	3.01 – 3.40	Above Average
Fair	3.41 – 3.80	Average Active Student
Poor	3.81 – 4.20	Below Average
Very Poor	> 4.21	Slow

This research process, the researcher used statistical data analysis methods to manage the data. This was because the data obtained was quantitative. Therefore, the researcher analyzed the quantitative data obtained using SPSS version 25.

RESULTS AND DISCUSSION

Result

This study aims to analyze the influence and effectiveness of cone drill training on the speed levels of futsal players. In addition to measuring its effects, this study also compares the effectiveness of this method in improving speed performance on the field.

Table 2. Pretest and Posttest Results After Cone Drill Training

No	Name	Class	Pretest (Second)	PostTest (Second)	Information
1	AS	9	3.52	3.30	Improved (Good)
2	JA	9	3.65	3.38	Improved (Good)
3	WL	9	3.78	3.55	Increased (Moderately)
4	HY	9	3.35	2.98	Improved (Very Good)
5	RF	9	4.15	3.75	Increased (Moderately)
6	BJ	9	3.60	3.35	Improved (Good)
7	MB	8	3.85	3.60	Increased (Moderately)
8	AF	8	3.48	3.25	Improved (Good)
9	JV	8	3.90	3.68	Increased (Moderately)
10	GB	8	3.55	3.32	Improved (Good)

Based on the data collected from the 20-meter sprint test on the subject group, the following statistical analysis was obtained:

1. Initial Condition (Pretest): The average running speed of the subjects before receiving the cone drill training treatment was 3.68 seconds. Referring to speed test norms, this average indicates that the subjects' initial abilities were generally in the Adequate category.
2. Final Condition (Post-Test): After receiving the cone drill training program, the subjects' average running speed changed to 3.41 seconds. This figure indicates improved performance, as the subjects were able to cover the same distance in a shorter time.
3. Magnitude of Improvement (Difference): There was a difference in average running time of 0.26 seconds (a decrease from 3.68 to 3.41). From a sports biomechanical perspective, a 0.26-second decrease in running time over a short distance (20 meters) represents significant progress in an athlete's speed.

The data analysis in this study used a Paired Sample T-Test using SPSS to determine the significance of the effect of training on the speed of students participating in the extracurricular futsal program at MTs Darut Taqwa 02 Purwosari Pasuruan. Decision-making was based on the significance value (2-tailed); if the Sig. (2-tailed) value is <0.05, the null hypothesis is rejected, indicating a significant difference between the pre-test and post-test results. Conversely, if the Sig. (2-tailed) value is >0.05, there is no significant difference between the two sets of data. The results of the statistical test are presented in the following table.

Table 3. Paired Sample T-Test Results

Cone Drill	***Mean***	***Std. Devation***	***Std. Error mean***	***95% Confidence Interval of the Difference***		***t***	***df***	***Sig. (2 Tailed)***
				Lower	***Upper***			
Pretest-Posttest	0.26700	0.05250	0.01660	0.22944	0.30456	16.082	9	0.000

Discussion

The data analysis confirmed that the cone drill training intervention significantly improved students' 20-meter sprint speed. This finding was validated by a decrease in average run time from 3.68 seconds in the pretest to 3.41 seconds in the posttest. Statistically, the effectiveness of this training was confirmed by the calculated t-value (16.082), which exceeded the t-table threshold, and a significance value of 0.000 ($p < 0.05$), indicating that the research hypothesis was empirically accepted.

The precision of this finding is reflected in the Std. Error Mean value of 0.01660, indicating minimal fluctuation in the sample data and a strong representation of the population. The reliability of the intervention was further strengthened by the 95% Confidence Interval of the Difference, which ranged from 0.229 to 0.304. Given that this interval did not exceed zero, it can be concluded that this increase in speed is a real result of the structured cone drill training program, not simply a statistical fluke.

Mechanically, this performance improvement occurs because cone drill training stimulates the body to coordinate complex movements, integrating explosive acceleration with dynamic balance control. The average time reduction of 0.26 seconds is a substantial achievement for a short distance of 20 meters. This phenomenon indicates adaptations in the central nervous system in synchronizing motor units, as well as strengthening the explosive power of leg muscles during the drive phase or initial acceleration phase.

This research demonstrates that the cone drill method is not only effective in improving agility but also contributes significantly to optimizing linear running speed. The multidirectional movement patterns in cone drill have been shown to strengthen stabilizer muscles, which in turn simultaneously increases the efficiency of students' stride frequency and stride length.

CONCLUSION

It can be concluded that cone drill training can significantly increase the speed of futsal players at MTs Darut Taqwa 02 Purwosari Pasuruan.

ACKNOWLEDGMENT

Thank you to the SMA Darut Taqwa Purwosari Pasuruan, which has permitted us to collect data so that this research could run well.

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