COMPETITOR:
JURNAL PENDIDIKAN KEPELATIHAN OLAHRAGA
e-ISSN: 2657-0734 & p-ISSN: 2085-5389 ‖ Volume 17, Number 2, 2025 ‖ P.1866-1874

The Effect of Dribbling Training Variations on Improving Ball Dribbling Speed in Futsal Players at SMKN 1 Jambi City Extracurricular

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ABSTRACT

This study aimed to investigate the effect of traditional games (hadang and This study aimed to investigate the effect of dribbling training variations on improving ball dribbling speed in futsal players at SMKN 1 Jambi City extracurricular program. This research employed an experimental method with a "One Group Pre-test Post-test Design". The population consisted of 20 futsal players from SMKN 1 Jambi City, with 10 players selected as samples using a purposive sampling technique. The training variations included slalom dribbling, sole dribbling, futsal mirror dribbling, and zig-zag run exercises conducted over 16 sessions with 4 sessions per week. The research instrument used the Figure-Eight Dribbling Test to measure dribbling speed. Data were analyzed using SPSS version 27, including a normality test, a homogeneity test, and a paired t-test. The research results showed significant improvement in dribbling speed after implementing training variations. The pre-test mean was 16.1610 seconds with a standard deviation of 1.18755, while the post-test mean was 14.9480 seconds with a standard deviation of 0.80772. The hypothesis test showed a significance value of 0.001 (< 0.05), indicating a significant difference between pre-test and post-test results. Dribbling training variations proved effective in improving futsal players' ball dribbling speed. The training program can be used as an alternative method for coaches to enhance players' technical skills systematically and continuously for optimal results.

ARTICLE HISTORY
Received: 2025/06/22
Accepted: 2025/06/27
Published: 2025/06/30

KEYWORDS
Dribbling Variations;
Ball Dribbling Speed;
Futsal;
Training Method;
Technical Skills.

AUTHORS' CONTRIBUTION
A. Conception and design of the study;
B. Acquisition of data;
C. Analysis and interpretation of data;
D. Manuscript preparation;
E. Obtaining funding

Cites this Article : Ramadhan, Syekh Muhammad; Muzaffar, Ahmad; Yanto, Anggel Hardi. (2025). The Effect of Dribbling Training Variations on Improving Ball Dribbling Speed in Futsal Players at SMKN 1 Jambi City Extracurricular. **Competitor: Jurnal Pendidikan Kepelatihan Olahraga**. 17 (2), p.1866-1874

INTRODUCTION

Sports activities serve not only for health purposes but also as specialised work, recreation, livelihood, health, and culture. One of the most popular sports currently enjoyed by many groups is futsal, including children, teenagers, and even adults. Futsal is an activity that attracts considerable attention from many people, both as a leisure time filler and a competitive arena. Futsal itself is a modification of the large ball sport (football) in terms of field size, game rules, and number of players (Taufik et al., 2022). Futsal is a team sport that is fast and dynamic, with accurate passing that allows many

goals to occur. According to (Murhananto, 2014), futsal is a term used internationally for indoor football games. It comes from the words *futbol* or *futebol* (from Spanish and Portuguese, meaning football player) and *salon* or *sala* (from French or Spanish, meaning indoors).

The sport of futsal began entering Indonesia in 2002. Official national-level competitions in Indonesia began to be held in 2008 by the National Futsal Board (BFN). Futsal sports follow football rules, which have been agreed upon by the International Football Association (FIFA) (FIFA, 2019). However, not all football rules are applied in futsal (Suryadi et al., 2023). The things that are changed according to conditions include field size, ball weight and material, goalpost width and height, game periods, and number of players. Futsal is an indoor team football game played by two teams, each consisting of five players. The goal is to score as many goals as possible into the opponent's goal and defend the goal from conceding. Futsal is played in two halves lasting 20 minutes (2x20 minutes). In addition to the five main players, each team is also allowed to have substitute players.

According to (Lhaksana, 2011), "Futsal is a fast and dynamic team sport with accurate passing that allows many goals to occur." According to (Tenang, 2008), "Futsal is an abbreviation of futbol (football) and sala (room) from Spanish; this sport shapes players to always be ready to receive and pass the ball quickly." The basic techniques that must be mastered by futsal players are passing, controlling, chipping, dribbling, and shooting. The basic techniques above are what characterise the futsal sport. One of the basic techniques that plays an important role in futsal games is the ball dribbling technique.

Dribbling is a basic technique in the game where a player has the ability to control the ball to deceive opponents. During matches, dribbling technique is needed to pass opposing players and direct the ball to empty spaces and open opportunities to shoot towards the goal. In addition, dribbling plays a very important role when counterattacks occur. According to (Hidayat & Hambali, 2022), "Dribbling is a method of moving the ball from one place to another point on the field using the feet. The ball must always be close to the feet to be easily controlled. Players should not continuously look at the ball; they must look around and watch the movements of other players."

The physical condition components are strength, endurance, muscle power, speed, flexibility, agility, coordination, balance, accuracy, and reaction. One of the physical condition components needed by futsal players in mastering ball dribbling technique is speed. It cannot be denied that speed greatly affects dribbling because this technique is needed as a way to move when passing opponents and opening space for passing or shooting. Ball dribbling speed is carrying the ball while running, and the ball remains under control (the ball is close to the feet) to be played. By having ball dribbling speed in futsal games, players will easily control the ball when attacking or defending, and can make deceptive movements to deceive opponents before the ball is given to teammates to create opportunities for scoring goals.

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METHODS

This study used an experimental research methodology. The design used in this research was a "One Group Pre-test Post-test Design". The following is a description of the research design:

S → Pre-test → T → Post-test

The population used in this study was futsal players from SMKN 1 Jambi City totaling 20 people. The sample of this research was futsal players from SMKN 1 Jambi City. In this study, from a population of 20 players, 10 players were selected using purposive sampling technique with the following criteria:

1. Active participation in routine training at SMKN 1 Jambi City futsal at least 3 times per week
2. Previously participated/strengthened the SMKN 1 Jambi City futsal team in several championships/competitions
3. Able to follow the training program for 16 sessions with a maximum of 20% or 3 times allowed absence from training

The research was conducted at Golden Futsal field in Jambi City from June 2-30, 2025, for 16 treatment sessions with training frequency 4 times per week on Monday, Wednesday, Friday, and Sunday from 15:30-17:30 WIB. The training variations included:

1. Slalom Dribbling: Players dribble the ball through 6 cones placed 1 meter apart in a straight line using inside and outside of the foot alternately.
2. Sole Dribbling: Players control the ball using the sole of the foot for 30-60 seconds with various movements including push-pull, alternating left-right, and ball rotation.
3. Futsal Mirror Dribbling: Two players with balls face each other, one leads dribbling movements while the other mirrors the movements.
4. Zig-Zag Run: Players dribble the ball through 5 cones in a zig-zag pattern with 2-meter spacing between cones.

Instrument

The research instrument used the Figure-Eight Dribbling Test to measure dribbling speed and skills with the following assessment criteria (Wala, 2025):

Table 1.
Assessment Criteria

Score	Category	Time (seconds)
5	Excellent	< 12.00
4	Good	12.00-14.00
3	Fair	14.00-16.00
2	Poor	16.00-18.00
1	Very Poor	> 18.00

Data were analyzed using SPSS version 27 including normality test using Shapiro-Wilk, homogeneity test using Levene test, and hypothesis testing using paired t-test at 95% confidence level or $\alpha = 0.05$.

RESULTS AND DISCUSSION

Descriptive Statistics

The following table shows the descriptive statistics of the research results:

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Table 2.
Descriptive Statistics

Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test	10	14.27	17.27	16.1610	1.18755
Post-test	10	13.82	16.07	14.9480	0.80772

From the table above, it can be seen that the mean for pre-test was 16.1610 with a standard deviation of 1.18755, while the maximum score was 17.27 and the minimum score was 14.27. For the post-test, the mean was 14.9480 with a standard deviation of 0.80772, while the minimum score was 13.82 and the maximum score was 16.07.

Table 3.
Pre-test Results

No	Interval	Frequency (N)	Percentage (%)	Category
1	> 18.00	0	0%	Very Poor
2	16.00-18.00	7	70%	Poor
3	14.00-16.00	3	30%	Fair
4	12.00-14.00	0	0%	Good
5	< 12.00	0	0%	Excellent
Total		**10**	**100%**	

Based on the pre-test results of ball dribbling speed ability in futsal extracurricular players at SMKN 1 Jambi City, 7 people (70%) were in the 16.00-18.00 time group, and 3 people (30%) were in the 14.00-16.00 time group. This shows that most futsal extracurricular players at SMKN 1 Jambi City had ball dribbling speed ability in the "Poor" category.

Table 4.
Post-test Results

No	Interval	Frequency (N)	Percentage (%)	Category
1	> 18.00	0	0%	Very Poor
2	16.00-18.00	2	20%	Poor
3	14.00-16.00	7	70%	Fair
4	12.00-14.00	1	10%	Good
5	< 12.00	0	0%	Excellent
Total		**10**	**100%**	

After implementing dribbling training variations, there was improvement with 7 people (70%) in the "Fair" category, 2 people (20%) in the "Poor" category, and 1 person (10%) in the "Good" category.

Table 5.
Normality Test Results

Test	Statistic	df	Sig.
Pre-test	0.947	10	0.629
Post-test	0.926	10	0.408

The normality test results using Shapiro-Wilk showed significance values > 0.05, indicating that the data were normally distributed.

The homogeneity test results showed a significance value of 0.498 > 0.05, indicating that the pre-test and post-test data had homogeneous variance.

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Table 6.
Hypothesis Test Results

Test	t	df	Sig. (2-tailed)	Mean Difference
Pre-test vs Post-test	43.034	9	<0.001	16.16100
Post-test	58.522	9	<0.001	14.94800

The hypothesis test results showed a significance value of 0.001 < 0.05, indicating there was a significant effect of dribbling training variations on improving ball dribbling speed in futsal extracurricular players at SMKN 1 Jambi City.

Discussion

Effectiveness of Dribbling Training Variations on Technical Skill Development

The research findings demonstrated significant improvement from pre-test to post-test results, with players advancing from predominantly the "Poor" category (70%) to the "Fair" category (70%) performance levels. This substantial improvement of 1.21 seconds (7.5% enhancement) in average completion time reflects the effectiveness of systematic dribbling training variations in developing technical skills. The initial assessment revealed suboptimal dribbling abilities among SMKN 1 Jambi City futsal players, attributed to insufficient training portions and inconsistent player commitment during practice sessions. However, the structured 16-session training program successfully addressed these deficiencies through progressive skill development and enhanced motor learning adaptation.

Biomechanical and Physiological Adaptations in Dribbling Performance

The observed performance improvements can be attributed to specific biomechanical adaptations that occur through repetitive practice of varied dribbling techniques (Fazri et al., 2024). The slalom dribbling exercises enhanced players' ability to rapidly shift body weight and change direction while maintaining ball control, developing crucial proprioceptive awareness and dynamic balance. Sole dribbling training improved fine motor control and touch sensitivity, allowing players to manipulate the ball with greater precision under pressure situations (Erianto et al., 2022). The integration of multiple training variations stimulated different muscle groups and movement patterns, creating comprehensive neuromuscular adaptations that translate to improved on-field performance during competitive situations.

Motor Learning Principles and Skill Transfer

The training program's success aligns with established motor learning principles, particularly the concept of variable practice leading to enhanced skill transfer. Each dribbling variation presented unique challenges that required players to adapt their movement strategies, promoting the development of flexible motor schemas essential for futsal performance (Pebrima et al., 2021). The futsal mirror dribbling exercises specifically enhanced reactive capabilities and decision-making speed, as players had to continuously adjust their movements in response to their partner's actions (Taufik et al., 2022). This variable practice approach facilitated the development of generalized motor programs that enable players to execute effective dribbling techniques across diverse game situations and opponent configurations.

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Training Periodization and Progressive Skill Development

The systematic progression from basic dribbling patterns to more complex movement combinations followed sound periodization principles that optimize skill acquisition (Matitaputty, 2019). The four-week training block with 16 sessions provided sufficient stimulus for adaptation while preventing overuse injuries commonly associated with repetitive training. The frequency of four sessions per week allowed adequate recovery between training sessions while maintaining the training momentum necessary for skill consolidation. Each training session built upon previous learning, creating a scaffolded approach that gradually increased complexity and challenge level to match players' developing capabilities (Fachrezi et al., 2024).

Technical Skill Components and Game Application

The dribbling training variations specifically targeted multiple technical components essential for futsal performance, including ball manipulation skills, spatial awareness, and temporal coordination. The zig-zag run exercises improved players' ability to accelerate and decelerate while maintaining ball control, skills directly applicable to beating opponents in confined spaces typical of futsal courts (Arwandi & Ardianda, 2018). The training program's emphasis on using different parts of the foot (inside, outside, sole) developed comprehensive ball control capabilities that enhance players' tactical options during matches. These technical improvements enable players to execute more creative attacking moves, maintain possession under pressure, and create scoring opportunities for teammates through individual skill expression.

Comparison with Previous Research and Theoretical Framework

The study's findings corroborate previous research by (Arwandi & Ardianda, 2018), who demonstrated that specific dribbling training methods significantly improve technical performance in football players. Similar to the current study, their research emphasized the importance of varied training stimuli in developing comprehensive dribbling abilities. The theoretical framework underlying this research draws from Skill Acquisition Theory, which posits that motor skills develop through three stages: cognitive, associative, and autonomous phases (Irawan et al., 2021). The observed improvements suggest that players progressed through these learning stages, achieving greater automaticity in dribbling execution that reduces cognitive load during competitive performance.

Physiological Demands and Energy System Development

The training variations imposed specific physiological demands that enhanced players' capacity to maintain dribbling quality throughout match duration. The intermittent nature of the exercises mimicked the energy demands of futsal, developing both aerobic and anaerobic energy systems crucial for sustained performance. The repeated acceleration and deceleration patterns inherent in dribbling training improved players' neuromuscular power and reactive strength, enabling more explosive movements during one-on-one situations. Additionally, the training program enhanced players' lactate tolerance and recovery capacity, allowing them to maintain technical precision even when experiencing fatigue during intense match periods.

Practical Implications for Coaching Methodology

The research findings provide valuable insights for futsal coaches seeking to optimize their training programs for technical skill development. The structured approach demonstrates that systematic progression and variation in training methods yield superior results compared to repetitive, monotonous practice sessions. Coaches should incorporate multiple dribbling variations within single training sessions to maximize skill transfer and maintain player engagement throughout the development process. The study also highlights the importance of consistent training frequency and adequate practice volume to achieve meaningful improvements in technical performance.

Cognitive and Perceptual Skill Enhancement

Beyond purely technical improvements, the training program enhanced players' cognitive and perceptual skills essential for effective dribbling in competitive situations. The mirror dribbling exercises specifically develop visual processing speed and anticipatory skills, enabling players to read opponent movements more effectively during matches (Fazri et al., 2024). The varied training stimuli improved players' decision-making capabilities under time pressure, a crucial skill for executing successful dribbling moves in confined spaces. These cognitive enhancements complement the technical improvements, creating more complete players capable of adapting their dribbling techniques to diverse tactical situations and opponent strategies.

Limitations and Future Research Directions

While the study demonstrated significant improvements in dribbling performance, several limitations should be acknowledged for future research considerations. The relatively small sample size of 10 players limits the generalizability of findings to broader futsal populations, necessitating replication with larger sample sizes across different skill levels and age groups. The four-week intervention period, though sufficient to demonstrate improvement, may not reflect optimal training duration for maximizing long-term skill retention and transfer to competitive performance. Future research should investigate the durability of training adaptations and identify optimal training volumes and intensities for sustained skill development. Additionally, future studies could explore the integration of dribbling training variations with tactical training components to assess their combined effects on match performance outcomes.

CONCLUSION

Based on the data analysis above, it is known that there was an effect of dribbling training variations on improving ball dribbling speed in futsal extracurricular players at SMKN 1 Jambi City. In the initial test, dribbling ability in futsal extracurricular players at SMKN 1 Jambi City was 161.61, with an average of 16.16. After treatment, there was improvement in ball dribbling speed in futsal extracurricular players at SMKN 1 Jambi City to 149.48 with an average of 14.94.

The data obtained concluded from the hypothesis that Ha was accepted and Ho was rejected, because it showed different pre-test and post-test results. From the research

results, it can be concluded that there was an effect of dribbling training variations on improving ball dribbling speed in futsal extracurricular players at SMKN 1 Jambi City.

For coaches, it is expected that the results of this research can be used as a reference in developing more effective training programs to improve futsal players' dribbling ability. For future researchers, it is recommended to expand the research scope by using larger samples and longer training durations to obtain more accurate results.

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