Journal of Physical Education and Sport Pedagogy

Journal homepage: https://ejournal.upi.edu/index.php/JPESP/index

The Effect of Ball Feeling Training on Dribbling Ability in Futsal Games: Systematic Review

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ABSTRACTS

Ball feeling training is a key component of technical training for developing dribbling skills in futsal. This study aims to systematically examine the effect of ball feeling exercises on dribbling ability in futsal based on empirical evidence from studies published between January 2020 and December 2025. This study employed a Systematic Literature Review (SLR) method following the PRISMA 2020 guidelines. Searches were conducted across three major databases: Google Scholar, PubMed, and Scopus. Of the 150 articles identified, 12 met the inclusion criteria and were analyzed in detail. All 12 included studies reported a positive effect of ball feeling exercises on dribbling ability, with 91.7% reporting statistically significant improvements ($p < 0.05$). The optimal training frequency was 3–4 sessions per week for at least 6 weeks. Combining ball feeling exercises with ladder drills and coordination training yielded better outcomes. Ball feeling training has been shown to consistently and meaningfully improve futsal dribbling ability. Therefore, coaches are advised to incorporate these exercises into regular training programs with progressively increasing levels of difficulty and varied training activities.

How to Cite: Ramadhan, M.H.; Mulyana, D.; Setyawan, D.A.; Miftachurochmah, Y.; Agus, H. The Effect of Ball Feeling Training on Dribbling Ability in Futsal Games: Systematic Review. *Journal of Physical Education and Sport Pedagogy* 6(2) 57-70

ARTICLE INFO

Article History:
Received 02 Aug 2026
Revised 28 Oct 2026
Accepted 30 Oct 2026
Available online 10 Nov 2026

Keyword:
Ball feeling, Dribbling, Futsal, Systematic literature review, Futsal coaching

INTRODUCTION

Futsal is a team sport played on a small court by five players per team, including the goalkeeper. The sport has grown rapidly worldwide, including in Indonesia, and has become one of the fastest-growing sports in recent decades. The distinctive characteristics of futsal compared with conventional football—smaller court dimensions, fewer players, and a lower-bounce ball—place considerable demands on players' technical proficiency.

Within this technical context, dribbling is one of the most important skills in futsal. Effective dribbling enables players to beat opponents, maintain possession, create space, and support attacking play. In the fast-paced, dynamic environment of futsal, dribbling ability is a key factor that distinguishes highly skilled players from average performers. Previous research indicates that futsal players change direction more frequently than football players because of the more restricted playing area; therefore, maintaining ball possession through effective dribbling is essential.

Given the central role of dribbling, ball feeling is an important underlying component of technical performance. Ball feeling refers to a player's ability to sense, control, and manipulate the ball using various parts of the body smoothly and precisely. Ball feeling exercises are designed to improve players' proprioception and kinesthetic awareness of the ball, making player–ball interactions more intuitive and efficient. These exercises include various movements, such as carrying the ball, rolling the ball, controlling it with different parts of the foot, and performing creative ball-control drills.

Consistent with this theoretical premise, various studies have examined the relationship between ball feeling training and dribbling skills in both football and futsal contexts. Widodo et al. (2024) found that a combination of ball feeling and ladder drill exercises had a significant effect on the dribbling ability of futsal players. Fadhillah et al. (2022) showed that varied ball feeling exercises significantly improved dribbling skills among high school students participating in extracurricular futsal. Qolbi et al. (2025) confirmed the effectiveness of combining ladder drills and ball feeling exercises in improving futsal athletes' dribbling skills. Faozi et al. (2022) demonstrated that ball feeling combined with coordination exercises could enhance dribbling skills in futsal. However, most studies used small sample sizes and were conducted within a single cultural context; therefore, caution is required when generalizing their findings.

Despite these promising findings, the available evidence remains fragmented across individual studies. Although numerous studies have examined the effect of ball feeling on dribbling skills, no systematic literature review has comprehensively synthesized empirical evidence specifically within futsal. Most previous reviews have focused on conventional football. The absence of a systematic synthesis based on the PRISMA 2020 guidelines represents an

important research gap that needs to be addressed, to provide coaches and researchers with a stronger evidence base when designing effective futsal training programs.

This gap is particularly relevant to the development of futsal in Indonesia, where the rapid growth of the sport has increased the need for scientific evidence regarding effective training methods. Ball feeling has long been recognized in practice as a foundation of technical skills in football and futsal. However, the strength of the available evidence in the futsal context requires systematic evaluation. This study addresses that need by synthesizing literature in accordance with PRISMA 2020 reporting standards, thereby producing evidence-based recommendations.

Based on this rationale, this study aims to: (1) systematically examine the effect of ball feeling training on dribbling ability in futsal based on empirical evidence from studies published between January 2020 and December 2025; (2) identify the methods, frequency, and duration of ball feeling exercises that have been shown to be effective; and (3) provide evidence-based recommendations for coaches and researchers in futsal coaching.

THEORETICAL FRAMEWORK

Ball Feeling in Futsal Coaching

In football coaching, ball feeling describes the ability to sense and control the ball through contact with different parts of the body. Modern football training programs developed this concept systematically before it was adopted in futsal. Motor learning theory offers an explanation for its role in technical development: repeated contact helps players build an internal model of ball properties and dynamics. As players gain experience, motor programs in procedural memory become more established, allowing technical movements to be performed with greater automaticity and efficiency (Schmidt & Lee, 2011).

When applied to futsal, this concept becomes even more important because the sport involves a smaller ball with a lower bounce than conventional football. These characteristics require greater proprioceptive adaptation from futsal players. Widodo et al. (2024) describe ball feeling as the foundation of all futsal technical skills, because without good ball control, other skills such as passing, shooting, and dribbling cannot be performed effectively.

Dribbling Skills in Futsal Games

Dribbling applies this control while a player is moving. In futsal, players use their feet to move the ball past opponents, create space, or retain possession. Suryanata et al. (2021) identify three dimensions of dribbling performance: speed, directional control, and rapid changes in speed. These dimensions are closely related. Moving quickly with the ball requires control of its

direction, while changes in pace require players to adjust their contact with it. Ball feeling therefore provides an underlying technical basis for each dimension of dribbling.

In addition to ball control, physical factors also contribute to effective dribbling performance. Research by Selin et al. (2024) found a strong correlation between agility and dribbling ability in futsal players, implying that an effective training program should integrate agility and ball control components. This provides a theoretical basis for combining ball feeling training with ladder drills, an approach found to be effective in several studies included in this review.

Systematic Literature Review as an Evidence Synthesis Approach

This study used a Systematic Literature Review (SLR) to bring together the conceptual and empirical evidence on ball feeling and dribbling. The approach identifies, evaluates, and synthesizes research addressing a defined question. Unlike a conventional narrative review, an SLR follows predefined procedures for selecting and synthesizing studies to minimize bias. The PRISMA 2020 guidelines (Page et al., 2021) guided reporting, providing a framework for documenting the review process transparently and supporting its reproducibility.

METHOD

Materials for Analysis

Literature searches were conducted in three major scientific databases: (1) Google Scholar, (2) PubMed/MEDLINE, and (3) Scopus. The search covered the period from January 2020 to December 2025. The keywords used included combinations of "ball feeling," "dribbling," "futsal," "training," "dribbling skill," "ball mastery," "ball feeling training," "futsal dribbling ability," and "dribbling skills." Boolean operators AND and OR were used to refine the search results in each database.

Organization of the Study

Following the searches, study selection followed the four stages of PRISMA 2020: identification, screening, eligibility assessment, and inclusion. The inclusion criteria were as follows: (a) published between January 2020 and December 2025; (b) discussed ball feeling and/or dribbling in the context of futsal or football; (c) reported empirical research or a literature review; (d) was available in full text; and (e) was written in Indonesian or English. The exclusion criteria included: (a) duplicate articles, (b) articles without clear outcome data, (c) irrelevant articles, and (d) non-peer-reviewed articles.

Following the selection stage, data were extracted by two independent reviewers using a predefined form that included author and year, study design, participant characteristics, type

of intervention, duration, measured outcomes, and key findings. Discrepancies between reviewers were resolved through discussion.

Methods of Analysis

The extracted data were synthesized narratively because substantial heterogeneity among studies—including variations in design, population, and measurement instruments—precluded a valid statistical meta-analysis. The methodological quality of each article was assessed using adapted criteria from the Critical Appraisal Skills Programme (CASP), including clarity of research objectives, appropriateness of study design, validity of instruments, adequacy of sample size, clarity of analysis, and relevance of conclusions.

RESULTS

Study Selection

The literature search and study selection process identified 150 articles from the databases searched (Google Scholar: 80; PubMed: 30; Scopus: 40). After removing duplicates and irrelevant records before screening (n = 45), 105 articles remained for title and abstract screening. A total of 72 articles were excluded at this stage because they were unrelated to the topic. Thirty-three reports were sought for full-text retrieval; however, 8 reports were inaccessible. Of the 25 reports assessed for eligibility, 13 were excluded for various reasons. Finally, 12 articles met all criteria and were included in the review. The complete article selection process is presented in Figure 1.

Figure 1. PRISMA Flowchart 2020 — Article Selection Process

PRISMA 2020 FLOWCHART	
IDENTIFICATION	
Articles identified from: Google Scholar (n = 80) PubMed (n = 30) Scopus (n = 40) Total (n = 150)	Records removed before screening: Duplicates (n = 35) Automation tools (n = 5) Other reasons (n = 5) Total removed (n = 45)
↓	
SCREENING	
Articles screened (n = 105)	Articles excluded (n = 72)
↓	
Reports sought for retrieval (n = 33)	Reports not retrieved (n = 8)
↓	
ELIGIBILITY	

Reports assessed for eligibility (n = 25)	**Excluded reports (n = 13):** Outside the time range (n = 1) Not about ball feeling (n = 5) Not futsal-related (n = 4) Non-peer-reviewed (n = 3)
↓	
INCLUDED	
Studies included in the review (n = 12)	Reports included in the review (n = 12)
Sources: Page MJ, et al. BMJ 2021; 372:n71. doi: 10.1136/bmj.n71	

Characteristics of Included Studies

Following the selection process, the characteristics of the included studies were examined to provide an overview of the available evidence. The 12 included studies were published between 2020 and 2025, and all were conducted in Indonesia. Most studies (83.3%, n = 10) used experimental or quasi-experimental designs, one study used a literature review approach, and one study used a correlational design. Sample sizes ranged from 12 to 40 participants, with an average of 22 participants per study. Most studies used standard dribbling tests as outcome measurement instruments. The complete characteristics of the included studies are presented in Table 1.

Table 1. Characteristics of Studies Included in the Systematic Review

No.	Author/Year	Design	Participants	Duration	Outcome	Key Findings
1	Widodo et al. (2024)	Quasi-experimental	15 futsal players	8 weeks	Dribbling test	Ball feeling and ladder drill exercises significantly improved dribbling ability ($p < 0.05$)
2	Fadhillah et al. (2022)	Experimental	30 high school students	6 weeks	Futsal dribbling test	Varied ball feeling exercises significantly improved dribbling ability
3	Qolbi et al. (2025)	Quasi-experimental	20 futsal athletes	8 weeks	Dribbling test	The combination of ladder drills and ball feeling

No.	Author/Year	Design	Participants	Duration	Outcome	Key Findings
						exercises effectively improved dribbling ability
4	Faozi et al. (2022)	Experimental	30 junior high school students	6 weeks	Dribbling test	Ball feeling and coordination exercises improved futsal dribbling ability ($p < 0.05$)
5	Juhanis et al. (2024)	Literature review	12 articles	-	Dribbling agility	Ball feeling and ladder drills were shown to improve dribbling agility
6	Sridadi et al. (2021)	Experimental	40 players aged 10–12 years	10 weeks	Dribbling speed	Ball-based technical exercises increased dribbling speed ($p < 0.05$)
7	Arsil et al. (2023)	Experimental	30 U13 athletes	8 weeks	Futsal skills	Zig-zag and triangle dribbling exercises improved futsal skills
8	Erianto et al. (2022)	Experimental	15 SSB players	6 weeks	Dribbling test	Ball feeling exercises had a significant effect on dribbling ability (calculated t > critical t)

No.	Author/Year	Design	Participants	Duration	Outcome	Key Findings
9	Pebrima et al. (2021)	Experimental	20 SSB athletes	6 weeks	Dribbling test	Ball feeling exercises improved dribbling ability among football school athletes ($p < 0.05$)
10	Suryanata et al. (2021)	Development	High school students	12 sessions	Training model	A game-based futsal dribbling training model was found to be effective
11	Selin et al. (2024)	Correlational	Futsal players	-	Agility & dribbling	A strong correlation was found between agility and dribbling in futsal players
12	Febrian & Bakti (2021)	Experimental	20 football players	8 weeks	Dribbling agility	Ball feeling combined with ladder drills significantly improved dribbling agility

Methodological Quality or Risk of Bias

In addition to study characteristics, methodological quality was assessed to evaluate the reliability of the evidence. The methodological quality assessment of the 12 included studies revealed some variation. Most studies (n = 8) clearly described participant characteristics and intervention procedures. Outcome measurement instruments were generally established measures used in sports research. However, several studies did not provide adequate information regarding randomization and blinding, which may increase the risk of selection and detection bias. The results of the methodological quality assessment are presented in Table 2.

Table 2. Methodological Quality Assessment of the Included Studies

Author/Year	Sample Clarity	Clarity of Intervention	Instrument Validity	Statistical Analysis	Relevance of the Conclusion	Risk of Bias
Widodo et al. (2024)	High	High	Medium	High	High	Low
Fadhillah et al. (2022)	High	High	Medium	High	High	Low
Qolbi et al. (2025)	High	High	Medium	High	High	Low
Faozi et al. (2022)	Medium	High	Medium	High	Medium	Medium
Juhanis et al. (2024)	High	Medium	Medium	Medium	High	Medium
Sridadi et al. (2021)	High	High	High	High	High	Low
Arsil et al. (2023)	High	High	Medium	High	High	Low
Erianto et al. (2022)	Medium	Medium	Medium	High	Medium	Medium
Pebrima et al. (2021)	Medium	Medium	Medium	High	Medium	Medium
Suryanata et al. (2021)	High	High	Medium	Medium	High	Medium
Selin et al. (2024)	High	Medium	High	High	High	Low
Febrian & Bakti (2021)	Medium	High	Medium	High	Medium	Medium

Synthesis of Main Findings

The Effect of Ball Feeling on Futsal Dribbling Ability

The synthesis examined the reported effects of ball feeling training on dribbling ability. All 12 analyzed studies reported a positive effect of ball feeling exercises on dribbling skills. Eleven of

the 12 studies (91.7%) reported statistically significant improvements, with p-values < 0.05 or calculated t-values exceeding critical t-values. Widodo et al. (2024) and Qolbi et al. (2025) specifically examined futsal athletes and found significant improvements in dribbling ability after ball feeling interventions combined with ladder drills. Fadhillah et al. (2022) and Faozi et al. (2022) reported similar findings among school students participating in extracurricular futsal activities.

Effects of Combined Training Methods

Several studies examined ball feeling alongside complementary training methods. Eight of the 12 studies combined ball feeling with ladder drills, coordination exercises, or game-based training. These studies consistently showed better outcomes than ball feeling exercises alone. Juhanis et al. (2024), in their literature review, confirmed that the combination of ball feeling training and ladder drills was more effective in improving dribbling agility than either method applied separately. This finding suggests that ball-control practice and footwork or coordination training may complement one another.

Factors Affecting the Effectiveness of Interventions

Intervention outcomes appeared to vary with program- and participant-related factors. The synthesis examined factors associated with intervention effectiveness. First, program duration ranged from 6 to 12 weeks, with studies lasting at least 8 weeks tending to report larger effects. Second, a training frequency of 3–4 sessions per week appeared more effective than lower frequencies. Third, participant age influenced the rate of improvement; for example, Sridadi et al. (2021) found a significant increase in dribbling speed among players aged 10–12 years, suggesting that sensitive periods of motor development respond particularly well to ball feeling training.

Summary of Evidence

Across the 12 included studies, the findings indicate that ball feeling exercises have a positive and significant effect on dribbling ability in futsal. Combining ball feeling with complementary methods yields better outcomes. Nevertheless, heterogeneity in study design, sample size, and measurement instruments should be considered when interpreting these findings. For coaching practice, this review recommends that coaches incorporate ball feeling exercises into a 6–8-week program with 3–4 sessions per week, preferably combined with agility training.

DISCUSSION

The review considers the synthesized evidence when interpreting why ball feeling exercises may enhance dribbling performance in futsal. All 12 included studies reported findings supporting ball feeling exercises for dribbling development. The consistency of these findings provides support for the conclusion that ball feeling is a valid and effective training intervention for developing futsal dribbling skills.

Motor learning theory provides one explanation for these findings (Schmidt & Lee, 2011). Systematic repetition in ball feeling exercises helps develop a more accurate internal representation of ball dynamics in the central nervous system. More frequent and varied player–ball contact strengthens motor programs in procedural memory, enabling faster, more precise, and more automatic dribbling. This aligns with the findings of Widodo et al. (2024), Qolbi et al. (2025), and Fadhillah et al. (2022), who reported significant improvements in dribbling ability after structured ball feeling training programs.

The reported advantages of combined training can also be considered in terms of motor learning. The superiority of combining ball feeling with ladder drills—as reported by Widodo et al. (2024), Qolbi et al. (2025), and Febrian and Bakti (2021), and confirmed by Juhanis et al. (2024)—can be understood through the principle of transfer specificity in motor learning. Ladder drills train stride speed and rhythmic coordination, which are also required when dribbling in dynamic game situations. When these components are trained simultaneously, positive transfer may accelerate the development of dribbling proficiency.

Coordination training offers a further perspective on the reported improvements in dribbling. Faozi et al. (2022) demonstrated the added value of coordination exercises when combined with ball feeling training. Effective eye–foot coordination enables players to process visual information from the surrounding environment while maintaining precise ball control—a dual-task skill that is essential in competitive futsal. Sridadi et al. (2021) added a developmental perspective, showing that among players aged 10–12 years, the high plasticity of the nervous system allows faster and more efficient adaptation to ball feeling exercises. This finding confirms the importance of introducing ball feeling training from an early age.

Game-based practice provides a way to apply these training principles. Suryanata et al. (2021) proposed a game-based futsal dribbling training model that inherently integrates elements of ball feeling. This approach offers the advantage of increasing players' intrinsic motivation while improving skill transfer from training situations to match contexts. Selin et al. (2024) strengthened this argument by identifying a strong correlation between agility and dribbling ability, suggesting that training programs integrating ball feeling and agility components may

produce the most comprehensive improvements in dribbling performance. Ramadhan et al. (2025) also reported that futsal plays an important role in developing players' decision-making skills, which also contribute to dribbling mastery under match conditions.

Several limitations constrain the interpretation of these findings. First, because all included studies were conducted in Indonesia, the findings may not be directly generalizable to other cultural contexts or sports coaching systems. Second, differences in research design, measurement instruments, and types of training across studies made it difficult to compare effects quantitatively. Third, not all studies reported effect sizes; therefore, the overall magnitude of the effect of ball feeling training could not be estimated precisely.

CONCLUSION

This systematic review examined 12 articles published between January 2020 and December 2025, with reporting guided by PRISMA 2020. The findings support ball feeling training as an approach to improving futsal dribbling skills: 91.7% of the included studies reported statistically significant improvements ($p < 0.05$). Combining ball feeling with ladder drills or coordination exercises was associated with greater benefits. The training recommendation is to include ball feeling as a core element of basic technical development rather than restrict it to the warm-up. Sessions should take place 3–4 times per week for at least 6–8 weeks, with progressive exercise variations to sustain improvement and avoid a plateau. These recommendations should be interpreted alongside the differences in study design, participant groups, and outcome measures described in this review.

To extend these findings, future research should address several key areas, including: (1) conducting meta-analyses with larger combined sample sizes; (2) involving player populations from different countries to strengthen the generalizability of findings; (3) examining the long-term effects of ball feeling training on dribbling performance in official match situations; (4) developing more valid and reliable standardized measures of futsal dribbling; and (5) designing more varied ball feeling training models to expand the methodological evidence base.

ACKNOWLEDGMENTS

The authors express their gratitude to all researchers and institutions whose findings informed this systematic literature review. Appreciation is also extended to the editorial board for its guidance during the publication process. This research did not receive dedicated institutional funding.

AI STATEMENT

The authors used Copilot solely to improve the language, grammar, spelling, and readability of the manuscript. The scientific content, literature selection, data synthesis, interpretation of findings, and conclusions were developed and verified by the authors. The authors reviewed and approved the final manuscript and take full responsibility for its content.

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