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Notational Analysis of Attacking Outcomes in Women's Futsal Teams at the AFC Women's Futsal Championship 2025

Nufi Saidatus Tsaniyah[1]*, Achmad Widodo[1], Irmantara Subagio[1], Luís Gonçalo Marques Estrela[2], Heri Wahyudi[1], Medina Mufid Fajrin[3]

[1]Surabaya State University, Indonesia
[2]University of Beira Interior, Portugal
[3]Yogyakarta State University, Indonesia

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Abstract

Notational analysis is a key method in modern futsal performance research, providing systematic and objective evaluation of match activities. This study aimed to analyze the attacking performance of women's futsal teams in the AFC Women's Futsal Championship 2025. A quantitative descriptive design was applied by using notational analysis. Data from 26 matches involving 12 national teams were obtained from BEPRO Analysis Software. Seven indicators were examined, including goals, assists, total shots, shots on target, shooting accuracy, shots off target, and blocked shots. Descriptive results showed the averages of 9.17±5.68 goals, 7.00±4.51 assists, 144.08±68.02 total shots, and 33.76±5.97% shooting accuracy. China, Japan, and Thailand were the most productive teams, recording 15–19 goals and more than 200 shots. Correlation analysis revealed strong significant relationships between goals and assists ($r = 0.928$; $p = 0.000$), total shots ($r = 0.711$; $p = 0.009$), and shots on target ($r = 0.752$; $p = 0.005$), while shooting accuracy showed no significant effect. In conclusion, a notational analysis is an evidence-based and effective tool for evaluating attacking performance and supporting tactical development in futsal. Future studies are recommended to incorporate defensive and contextual variables to obtain a more comprehensive performance assessment.

*Correspondence Address : Jalan Lidah Wetan, Surabaya, Indonesia
E-*mail* : nufipjkr34@gmail.com

INTRODUCTION

In modern sport, observation and analysis play a crucial role as they support the development of both athletes and teams while assisting coaches and players in the decision-making (Agras et al., 2016). Their relevance becomes evident throughout the training micro cycle, particularly in the adaptation of training drills, refinement of coaching interventions during team meetings, and the overall management of tactical processes (Gonzalez-Rodenas et al., 2017; Sarmento et al., 2015). Coaches can stimulate and enhance decision-making behaviors by manipulating specific constraints within practice tasks (Correia et al., 2012). Systematic observation and performance analysis are essential for understanding in-game dynamics, detecting strengths and weaknesses, and assessing the tactical strategies of opponents in futsal (de Pádua et al., 2017; Sarmento et al., 2015).

Futsal is defined by continuous interactions between attack and defense, characterized by a balance of cooperation and opposition under conditions of unpredictability and randomness (Alves & Bueno, 2012; Sarmento et al., 2016; Wolański et al., 2017). Through collective positional organization, teams aim to create advantageous scoring opportunities (Moura et al., 2011). The dimensions of the court and the rules of futsal emphasize the importance of technical and tactical effectiveness (Lapresa et al., 2015), while limited space and time require players to act, think, and decide quickly to anticipate play, create openings, and generate finishing actions (Abdel-Hakim, 2014). Tactical schemes, developed through pre-organized and well-rehearsed movements, are fundamental to producing optimal scoring scenarios (Alves & Bueno, 2012). Given the complexity of futsal, which demands rapid decision-making, coordinated teamwork, and efficiency within spatial and temporal constraints, a systematic approach is required to gain a deeper understanding of match dynamics (Almeida et al., 2019). Reliance on subjective observation alone is often insufficient due to the fast-paced nature of the sport and the presence of multiple simultaneous technical and tactical actions that may be overlooked in real time.

To address these challenges notational analysis provides an objective, measurable, and reproducible method for evaluating technical actions and their outcomes. It allows performance to be documented scientifically, enabling key match events to be consistently and reliably assessed (Hughes et al., 2022; Mendes et al., 2022). This process facilitates the delivery of accurate quantitative and qualitative feedback, which is fundamental to the enhancement of performance (Lochhead et al., 2024). Notational analysis has evolved into a comprehensive approach that combines the recording of match actions with outcome assessment and interaction interpretation, allowing coaches to evaluate the tactical impact of player behaviors.

However, despite its importance, previous research on futsal performance analysis has predominantly focused on general indicators, specific technical skills, or men's competitions, with limited investigation into attacking effectiveness in elite women's futsal using systematic notational procedures. Moreover, existing studies have not explicitly quantified which attacking performance variables most strongly contribute to scoring success, nor integrated offensive volume and efficiency metrics within a statistical correlation framework in an international tournament context. This presents a significant gap in the literature, particularly given the increasing competitiveness and visibility of women's futsal at the global level.

This study aims to analyze attacking outcomes of women's futsal teams during the AFC Women's Futsal Championship 2025 using notational analysis. The novelty of this research lies in its exclusive focus on elite women's futsal and its comprehensive integration of seven key attacking indicators (goals, assists, total shots, shots on target, shooting accuracy, shots off target, and blocked shots) with statistical correlation analysis to determine their influence on scoring productivity. This evidence-based analysis is expected to provide deeper

insight into tactical efficiency and offer practical implications for the development of high-performance strategies in international women's futsal.

METHOD

Research Design and Participants

This study employed a quantitative descriptive design. This study examined all attacking outcomes recorded during the AFC Women's Futsal Championship 2025, which featured 12 national teams: Chinese Taipei, Indonesia, Vietnam, Hong Kong, Uzbekistan, Australia, Philippines, Bahrain, Japan, Iran, Thailand, and China. A total sampling method was applied, in which all 26 official matches played during the tournament were selected as the sample, ensuring full representation of team performance at the international level.

Instruments

Match footage and performance data were obtained from BEPRO: Analysis Software, Cameras and Data for Sports Teams, a system standardized by FIFA for official match performance analysis, which allowed researchers to review each attacking sequence from the moment possession was gained until the offensive phase concluded. Data were organized using Microsoft Excel. A notational analysis protocol was designed in consultation with UEFA and AFC futsal coaches and informed by previous research on performance indicators in futsal. The coding process was conducted by the AFC-appointed performance analyst team to ensure methodological consistency with international performance assessment standards. To enhance reliability, operational definitions for all variables were discussed and agreed upon before the analysis began. Additionally, formal permission to access match footage and utilize performance data was obtained from the Asian Football Confederation (AFC) as tournament organizer and BEPRO Technologies as the official data provider. The attacking performance in this study was evaluated based on several attacking outcome variables. These included (1) Goals; (2) Assists; (3) Total Shots; (4) Shots on Target; (5) Shooting Accuracy (%); (6) Shots off Target; (7) Blocked Shots.

Data Analysis

Data analysis was performed using IBM SPSS Statistics version 26 to examine the relationship between attacking performance indicators and goal-scoring outcomes through a pearson correlation test, following normality assessment using the Shapiro–Wilk test. Statistical significance was set at $p < 0.05$.

Table 1. Operational Definitions of Attacking Outcomes Performance Indicators in Women's Futsal

Variable	Performance Indicator	Performance Indicator
Attacking Outcome	**Goals**	The number of goals scored as a direct result of the offensive sequence.
	Assists	The final pass or action that directly led to a goal.
	Total Shots	The total number of shot attempts, including both on- and off-target attempts.
	Shots on Target	The number of shots directed toward the goal that required a save or resulted in a goal.
	Shooting Accuracy (%)	The proportion of total shots that were on target, calculated as (Shots on Target ÷ Total Shots) × 100.
	Shots off Target	The number of shots that missed the goal without being blocked by the defense.
	Blocked Shots	The number of shots intercepted or deflected by defenders before reaching the goal.

RESULTS

The descriptive analysis of attacking outcomes performance indicators provides a general overview of the offensive characteristics demonstrated by the participating teams in the AFC Women's Futsal Championship 2025. These indicators reflect the overall attacking productivity, including goal scoring, assists, total shots, shots on target, shooting accuracy, shot off target, and blocked shot. Examining these variables offers a deeper understanding of how teams build and execute their offensive strategies throughout the tournament. A summary of the attacking performance indicators is presented in Table 2.

Table 2. Descriptive Statistics of Attacking Outcomes Performance Indicators in Women's Futsal Teams at the AFC Women's Futsal Championship 2025

Performance Indicator	Matches (n)	Country (n)	Min	Max	Total	Mean	Std. Dev
Goals	26	12	2	19	110	9.17	5.686
Assist	26	12	2	16	84	7.00	4.513
Total Shot	26	12	63	250	1729	144.08	68.021
Shot On Target	26	12	22	85	582	48.50	24.194
Shooting Accuracy	26	12	24	42	405	33.76	5.969
Shot Off Target	26	12	24	102	711	59.25	27.625
Blocked Shot	26	12	12	66	436	36.33	18.470

Based on the data presented in the table, the attacking performances of the 12 participating countries show considerable variation. The average number of goals scored was 9.17 ± 5.686, with a minimum of 2 goals and a maximum of 19 goals, resulting in a total of 110 goals across all matches. This indicates a clear disparity between teams with high attacking effectiveness and those struggling to convert chances into goals. The number of assists followed a similar pattern, with an average of 7.00 ± 4.513, ranging from 2 to 16 assists, and a total of 84 assists, suggesting that teamwork and collective play contributed significantly to goal-scoring outcomes for most teams.

The total number of shots demonstrated a high level of offensive activity, with an overall total of 1,729 shots, an average of 144.08 ± 68.021, and a range between 63 and 250 shots. This reflects that most teams maintained an attacking approach, though their finishing efficiency varied. Of these, shots on target accounted for 582 in total, with an average of 48.50 ± 24.194, and ranged from 22 to 85, showing differences in teams' ability to direct shots accurately toward the goal.

The average shooting accuracy was 33.76 ± 5.969%, with a range between 24% and 42%, indicating a moderate level of finishing efficiency. Some teams were able to utilize their opportunities effectively, while others still showed inefficiency in converting chances. The number of off-target shots was also relatively high, totaling 711 shots, with an average of 59.25 ± 27.625 and a range between 24 and 102, suggesting that while many opportunities were created, accuracy remained an area needing improvement. The blocked shots totaled 436, with an average of 36.33 ± 18.470 and a range between 12 and 66, indicating frequent defensive interventions that prevented many shooting attempts from reaching the goal.

Overall, the data show that teams with a high number of total shots and strong shooting accuracy, such as China, Japan, and Thailand ended to have greater goal productivity compared to others. The effectiveness of finishing and the ability to convert chances into goals appear to be the key factors distinguishing attacking performance among the participating teams in this championship.

Table 3. Attacking Outcomes Performance Indicators of National Team in the AFC Women's Futsal Championship 2025

National Team	Match (n)	Goals	Assist	Total Shots	Shots On Target	Shooting Accuracy (%)	Shots Off Target	Blocked Shots
Japan	6	16 ± 1.5	16 ± 1.5	225 ± 9.09	83 ± 3.81	36.9 ± 6.61	90 ± 4.77	52 ± 4.17
Thailand	6	15 ± 1.87	12 ± 2.09	225 ± 13.44	71 ± 7.49	31.6 ± 10.72	88 ± 3.77	66 ± 5.58
Iran	6	11 ± 1.03	9 ± 0.83	231 ± 25.76	80 ± 6.62	34.6 ± 5.82	96 ± 9.12	55 ± 6.43
Hong Kong	4	12 ± 3.09	8 ± 1.82	81 ± 9.17	34 ± 5.19	42 ± 7.00	24 ± 2.16	23 ± 3.40
Chinese Taipei	4	11 ± 2.36	6 ± 1.29	116 ± 9.12	44 ± 4.24	37.9 ± 8.23	49 ± 3.77	23 ± 3.09
Vietnam	4	8 ± 2.44	6 ± 1.73	134 ± 19.62	33 ± 6.55	24.6 ± 14.78	59 ± 9.03	42 ± 5.97
Indonesia	4	5 ± 1.89	3 ± 0.95	104 ± 9.2	28 ± 5.16	26.9 ± 13.69	49 ± 4.34	27 ± 2.98
Uzbekistan	3	5 ± 1.15	5 ± 1.15	108 ± 10.81	37 ± 3.51	34.3 ± 7.45	51 ± 7.21	20 ± 2.30
Bahrain	3	3 ± 1	3 ± 1	63 ± 2.64	23 ± 2.08	36.5 ± 5.87	28 ± 2.30	12 ± 2
Philippines	3	3 ± 1.73	2 ± 1.15	91 ± 8.73	22 ± 1.52	24.2 ± 1.84	38 ± 2.08	31 ± 5.50
Australia	3	2 ± 0.57	2 ± 0.57	101 ± 3.51	42 ± 1	41.6 ± 6.93	37 ± 2.51	22 ± 2.08

Based on the data presented in the table, it can be observed that the attacking performances among participating countries vary considerably. China demonstrated the highest level of attacking productivity, recording 19 ± 1.72 goals and 12 ± 1.09 assists from six matches, with a total of 250 ± 10.4 shots, including 85 ± 5.19 shots on target, and mean shooting accuracy of 34 ± 9.29%. They also registered 102 ± 6.54 off-target shots and 63 ± 4.18 blocked shots, indicating a high level of offensive intensity and dominance in creating scoring opportunities. Japan ranked second with an equally strong attacking performance, recording 16 ± 1.5 goals and 16 ± 1.5 assists.

The team produced 225 ± 9.09 total shots, 83 ± 3.81 shots on target, and achieved a 36.9 ± 6.61% shooting accuracy, reflecting an effective finishing ability. Moreover, Japan had 90 ± 4.77 off-target shots and 52 ± 4.17 blocked shots, demonstrating their consistency in attacking play and sustained offensive pressure on opponents. Thailand followed closely with 15 ± 1.87 goals and 12 ± 2.09 assists from six matches, generating 225 ± 13.44 total shots but their shooting accuracy was slightly lower (31.6 ± 10.72%), with 71 ± 7.49 shots on target, 88 ± 3.77 off target, and 66 ± 5.58 blocked shots. Meanwhile, Iran recorded 11 ± 1.03 goals and 9 ± 0.83 assists, producing 231 ± 25.76 total shots, 80 ± 6.62 on target, 96 ± 9.12 off target, and 55 ± 6.43 blocked, with a shooting accuracy of 34.6 ± 5.82%, reflecting a high attacking volume and consistent chance creation. Among teams with fewer matches, Hong Kong performed efficiently with 12 ± 3.09 goals and 8 ± 1.82 assists from only four matches, recording 81 ± 9.17 total shots. Despite a lower shot volume, they achieved high efficiency, with a 42 ± 7.00% shooting accuracy, 34 ± 5.19 shots on target, 24 ± 2.16 off target, and 23 ± 3.40 blocked shots.

Chinese Taipei also showed solid attacking efficiency with 11 ± 2.36 goals, 6 ± 1.29 assists, 116 ± 9.12 total shots, 44 ± 4.24 on target, and 37.9 ± 8.23% accuracy, while recording 49 ± 3.77 off target and 23 ± 3.09 blocked shots. Within the ASEAN region, Vietnam recorded 8 ± 2.44 goals and 6 ± 1.73 assists, with 134 ± 19.62 total shots, 33 ± 6.55 on target, 59 ± 9.03 off target, and 42 ± 5.97 blocked, accompanied by a relatively low shooting accuracy of 24.6 ± 14.78%. Indonesia displayed lower attacking productivity, registering 5 ± 1.89 goals and 3 ± 0.95 assists, with 104 ± 9.2 total shots, 28 ± 5.16 on target, 49 ± 4.34 off target, 27 ± 2.98 blocked, and a 26.9 ± 13.69% accuracy rate.

Meanwhile, Uzbekistan, which played three matches, recorded 5 ± 1.15 goals, 5 ± 1.15

assists, 108 ± 10.81 total shots, 37 ± 3.51 on target, 51 ± 7.21 off target, 20 ± 2.30 blocked, and an accuracy of 34.3 ± 7.45%. The three teams with the lowest attacking productivity were Bahrain, the Philippines, and Australia.

Bahrain scored 3 ± 1 goals and 3 ± 1 assists, with 63 ± 2.64 total shots, 23 ± 2.08 on target, 28 ± 2.30 off target, 12 ± 2 blocked, and a shooting accuracy of 36.5 ± 5.87%. The Philippines recorded 3 ± 1.73 goals, 2 ± 1.15 assists, 91 ± 8.73 total shots, 22 ± 1.52 on target, 38 ± 2.08 off target, and 31 ± 5.50 blocked, with a low accuracy of 24.2 ± 1.84%. Lastly, Australia registered 2 ± 0.57 goals and 2 ± 0.57 assists, with 101 ± 3.51 total shots, 42 ± 1 on target, 37 ± 2.51 off target, and 22 ± 2.08 blocked, showing a relatively high shooting accuracy of 41.6 ± 6.93%.

Table 4. Correlation between Attacking Outcomes Performance Indicators and Goal Scoring in the AFC Women's Futsal Championship 2025

Indicator Performance	P-Value	Correlation	Meaning
Assist	0.000	0.928	Very strong and significant correlation
Total Shot	0.009	0.711	Strong and significant correlation
Shot On Target	0.005	0.752	Strong and significant correlation
Shooting Accuracy	0.579	0.178	No significant correlation

The correlation analysis between attacking performance indicators and the number of goals during the AFC Women's Futsal Championship 2025 provides a clear illustration of how offensive dynamics influence scoring productivity. The assist variable shows a very strong and significant positive relationship with the number of goals scored ($r = 0.928$; $p = 0.000$), emphasizing the critical role of structured build-up play and final passes in creating effective goal-scoring opportunities. Organized attacking patterns, accurate passing combinations, and efficient support play contribute substantially to offensive success. China stands out as a representative example of this pattern, recording 12 assists that are directly associated with its tournament-high total of 19 goals. A strong relationship is also observed for total shots ($r = 0.711$; $p = 0.009$) and shots on target ($r = 0.752$; $p = 0.005$), reflecting the importance of opportunity volume in determining match outcomes. Teams that consistently generate a higher number of attempts, especially those directed toward the goal, increase their probability of scoring. Japan, with 225 total shots and 83 shots on target, recorded 16 goals, while Thailand produced the same number of total shots (225) and 71 on-target attempts, resulting in 12 goals. This pattern highlights the decisive impact of offensive volume on scoring performance, demonstrating that sustained attacking pressure is a key component of successful futsal strategies. Shooting accuracy alone does not present a significant relationship with goal production ($r = 0.178$; $p = 0.579$). Although accuracy represents finishing efficiency, the data indicate that it is not a sufficient predictor of goal productivity without adequate shooting frequency. Australia provides a clear example of this situation. Despite registering the highest shooting accuracy in the tournament (41.6%), the team scored only two goals due to a low total shot count of 101 attempts. This case illustrates how efficiency in isolation cannot compensate for a lack of offensive volume. The pattern of these findings reflects the essential nature of futsal as a high-intensity, fast-paced sport that rewards teams capable of producing a high number of goal-scoring opportunities. Teams with an aggressive attacking approach not only generate more attempts but also increase their likelihood of creating dangerous situations in the final third. This characteristic distinguishes top-performing teams such as China, Japan, and Thailand from lower-scoring teams that rely on fewer opportunities. Offensive strategies focused on creating frequent and

high-quality chances have proven to be more effective than those relying solely on efficient finishing. The evidence reinforces the idea that attacking performance in futsal cannot be reduced to a single indicator such as shooting accuracy. The strong correlations between goal production, assists, total shots, and shots on target demonstrate that offensive productivity depends on the interaction of multiple technical and tactical factors. Teams with structured offensive organization, the ability to generate a high number of opportunities, and consistent execution in front of goal are more likely to dominate matches and achieve superior scoring outcomes.

DISCUSSION

The findings of this study confirm that notational analysis plays a crucial role in understanding the dynamics of futsal and improving attacking effectiveness, particularly in women's futsal at the international level. The analysis focused solely on attacking outcomes without examining build-up play, defensive transitions, or tactical variations across different match contexts. The exclusive use of quantitative notational data, without complementary qualitative tactical assessment. Future studies are encouraged to integrate defensive and transition indicators, include contextual variables, and apply mixed-method approaches for a more holistic evaluation of performance in futsal. The data analysis shows a strong and significant relationship between attacking performance indicators such as assists, total shots, and shots on target with the number of goals scored. This indicates that a team's success in scoring goals does not depend on a single factor but is the result of a complex interaction between technical, tactical, and collective aspects of the game. The assist variable shows the strongest correlation with goals ($r = 0.928$; $p = 0.000$), illustrating that organized attacking patterns and teamwork are the most dominant factors in achieving scoring success. The better the coordination among players in executing the final pass, the higher the likelihood of creating goal opportunities. These findings highlight that notational analysis is an effective tool for identifying and understanding such patterns of play (González-Jarrín et al., 2025). Through a systematic and data-driven approach, this analysis provides an objective picture of a team's overall performance (Frost et al., 2025; Mănescu, 2025). Quantitative evaluation of attacking outcomes helps coaches and analysts identify the most effective offensive strategies while highlighting areas that need improvement. Notational analysis functions not only as a statistical recording method but also as a performance evaluation instrument that can be used to enhance training quality, develop tactical strategies, and support decision-making during matches (Caso, 2025).

The significant correlations between total shots and shots on target with goals emphasize the importance of maintaining attacking intensity in futsal (Santi & Ravivuth Rangubhet, 2023). Teams capable of producing a high number of shot attempts and maintaining consistency in directing the ball toward the goal demonstrate greater game dominance and a higher probability of scoring (Kim et al., 2019). Through notational analysis, this aspect can be explored in depth to determine how effectively a team converts opportunities into goals. The results can serve as a foundation for coaches to make tactical adjustments, such as improving the quality of quick transitions from defense to attack, enhancing positional understanding among players, or strengthening finishing drills under match-like pressure conditions. The shooting accuracy variable does not show a significant relationship with the number of goals scored, indicating that efficiency alone does not guarantee offensive success. Teams with high shooting accuracy do not necessarily score more goals if not supported by sufficient attacking outcomes (Gonzalez-Rodenas et al., 2017). Contextual factors such as the opponent's defensive compactness, goalkeeper quality, and situational pressure during matches also influence final results (Santos & Lago-Penas, 2019). Notational analysis plays an essential role as it

allows researchers and coaches to interpret data not only in terms of quantity but also in terms of the quality of on-field actions. By linking technical indicators with tactical contexts, this analysis provides a more comprehensive understanding of attacking effectiveness and the factors that affect it. Despite these strengths, the study presents certain limitations.

The application of notational analysis in modern futsal represents an important step toward evidence-based performance evaluation. The systematic process of recording and analyzing data enables coaches to deliver more precise feedback to players (Frost et al., 2025). The resulting data can be used to develop more specific training models tailored to the team's needs in improving the quality of their attacking outcomes. Teams that effectively utilize data are better able to recognize their success patterns, identify weaknesses that need improvement, and adjust their game strategies based on empirical evidence rather than subjective perception (Rodrigues et al., 2025). Overall, the findings of this study confirm that success in futsal attacking play results from a combination of attacking outcomes quality, team coordination, and rapid, accurate decision-making. Teams such as China, Japan, and Thailand demonstrate that an aggressive and well-structured offensive approach significantly enhances goal-scoring potential. These findings reinforce the importance of notational analysis as a scientific approach in sports, as it enables objective performance evaluation, systematic tactical assessment, and performance improvement based on valid and measurable data.

CONCLUSION

This study concludes that notational analysis is an effective tool for evaluating and improving attacking performance in women's futsal. Analysis of the AFC Women's Futsal Championship 2025 shows strong correlations between assists, total shots, shots on target, and goal-scoring, with assists demonstrating the highest impact, emphasizing the importance of teamwork and structured offensive patterns. While shot quantity contributes significantly to scoring effectiveness, shooting accuracy alone is not a decisive factor.

Notational analysis supports evidence-based performance evaluation, enabling coaches to identify strengths, address weaknesses, and optimize tactical and training strategies. Successful attacking play relies on the integration of technical execution, team coordination, and rapid decision-making. Future research should incorporate defensive and contextual variables to provide a more comprehensive analysis. Regular use of notational analysis is recommended to improve decision-making and enhance competitive performance in women's futsal.

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