An inferential and contextual analysis of goal-scoring mechanisms in the 2023 AFC Asian Cup

Análisis inferencial y contextual de los mecanismos de anotación de goles en la Copa Asiática de la AFC 2023

Authors

Ismail Zakarneh [1]
Ahmad Nassar [2]
Mohammad Shorbaji [3]
Ghaith Nasief [4]

[1, 2, 4] Palestine Technical University-Kadoorie, Palestine
[3] Ministry of Education, Palestine

Corresponding author:
Ahmad Nassar
a.nassar@ptuk.edu.ps

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Abstract

Introduction: the analysis of goal-scoring mechanisms is essential for understanding offensive performance in elite football. the 2023 continental tournament offered an appropriate competitive context for examining these patterns from an inferential and contextual perspective.
Objective: the objective of the study was to analyze goal-scoring mechanisms in the 2023 Asian cup of the Asian football confederation, focusing on mode of play, offensive actions, tournament phase, match timing, and their contextual relationships.
Methodology: a descriptive analytical design was employed. all goals scored during the tournament were examined through systematic observation using the Wyscout performance analysis platform. goals were classified according to open play and set-piece situations, finishing mechanisms, competitive phase, and time of scoring. inter-observer reliability procedures were applied, and univariate inferential statistical analyses were conducted.
Results: the findings indicated a significantly higher frequency of goals from open play compared with set-piece situations. clear structural differences were observed between the two modes of scoring, with set-piece goals concentrated in a limited number of actions. open-play goals showed an uneven distribution, with crosses and long-range shots contributing a higher proportion.
Discussion: these findings were aligned with previous studies emphasizing the dominance of open play, while also revealing greater dependence on set-piece actions during knockout phases and under increased competitive pressure.
Conclusions: the study showed that goal scoring in elite Asian football combined open-play predominance with context-driven tactical adjustments, offering practical implications for offensive training and match preparation.

Keywords

AFC Asian cup 2023; contextual analysis; football performance analysis; goal-scoring mechanisms; open play.

Resumen

Introducción: el análisis de los mecanismos de anotación de goles es esencial para comprender el rendimiento ofensivo en el fútbol de élite. el torneo continental de 2023 ofreció un contexto adecuado para examinar estos patrones desde una perspectiva inferencial.
Objetivo: el objetivo del estudio fue analizar los mecanismos de anotación de goles en la copa asiática 2023 de la confederación asiática de fútbol, centrándose en el modo de juego, las acciones ofensivas, la fase del torneo y el momento del partido.
Metodología: se empleó un diseño descriptivo analítico. todos los goles anotados durante el torneo fueron examinados mediante observación sistemática utilizando la plataforma de análisis Wyscout. los goles se clasificaron según juego abierto y acciones a balón detenido, mecanismos de finalización y fase competitiva. se aplicaron procedimientos de fiabilidad interobservador y análisis estadísticos inferenciales univariados.
Resultados: los resultados indicaron una frecuencia significativamente mayor de goles procedentes del juego abierto en comparación con las acciones a balón detenido. se observaron diferencias estructurales entre ambos modos de anotación, con concentración de los goles a balón detenido en un número limitado de acciones. los goles en juego abierto mostraron una distribución desigual, destacando los centros y los disparos lejanos.
Discusión: estos hallazgos se alinearon con estudios previos que enfatizan el predominio del juego abierto y revelaron mayor dependencia de las acciones a balón detenido en fases eliminatorias.
Conclusiones: el estudio mostró que la anotación de goles en el fútbol asiático de élite combinó el predominio del juego abierto con ajustes tácticos, ofreciendo implicaciones prácticas para el entrenamiento ofensivo.

Palabras clave

Copa asiática AFC 2023; análisis contextual; análisis del rendimiento en fútbol; mecanismos de anotación de goles; juego abierto.

Introduction

Football is the most popular sport in the world and has the largest fan base globally and across diverse cultural contexts, including the Middle East (Giulianotti, 1999). At the elite level, the changing nature of modern football performance has been substantial with the advent of tactical planning and training as well as systematic use of performance analysis technologies (González-Ródenas et al., 2020). The AFC Asian Cup and major continental tournaments, such as the UEFA European Championship and the Copa América, provide a very competitive setting in which technical and tactical behavior can be studied under maximum performance pressure.

In fact, goal scoring is among a number of factors that impact match results that remain the key to success in football. As a result, coaches, analysts, and sport scientists are particularly concerned with the production of goals. Modern performance analysis is a necessary scientific method for objectively assessing match events by consistently defining the technical and tactical actions that bring about scoring opportunities (Clement et al., 2020).

The nature of football match analysis is complex because the player moves continuously, as they transition quickly from offensive to defensive action, and because the tactical variables react in dynamic ways within vast play areas (Clement et al., 2020). Contemporary performance models emphasize the interaction between structural organization, situational constraints, and contextual pressure in shaping goal-scoring behavior (Ferraz, 2025). To address these issues, professional football research and practice has become increasingly reliant on video and data analysis systems. Such systems are able to precisely detect mechanisms of scoring goals and provide an empirical basis for evaluating offensive performance. Wyscout and other performance tools have become well-known in professional football for their utility in coaching decisions and scientific research.

Previous research on international tournaments has shown that goals are most frequently scored through open play, and set-piece situations also account fora significant portion of goals scored. As identified in FWC competitions, goals from open play account for 60-75% of goals scored, with the remaining goals coming from set pieces such as penalty kicks, corner kicks and free kicks (Kubayi, 2020; Mićović et al., 2022; Al-Dawi, 2023). Nevertheless, the proportion of scoring from set pieces tends to increase when operating within defensively compact formations and in matches of greater significance (Vergonis et al., 2021; Al-Johary et al., 2022). This concludes that while open play is the best route to goal scoring, set pieces may have a more limited tactical influence in games that are defensively compact and feature little open-play potential.

Despite the increasing number of studies documenting patterning in goal-scoring at world tournaments, much of the literature is still largely descriptive, examining frequency distributions without formally testing statistical significance. In addition, there are still relatively few studies specifically concerning elite Asian football matches (Zainuddin et al., 2022), and no thorough analysis of the mechanism of goal-scoring has yet been conducted for the AFC Asian Cup 2023.

This gap needs to be identified both for scientific purposes and for the development of evidence-based coaching in Asian football settings.

In this regard, the present study aims to further the descriptive literature in this context by developing a descriptive-analytical approach that permits the systematic classification and statistical evaluation of mechanisms of goal scoring in the 2023 AFC Asian Cup. This study seeks to provide a grounded analytical assessment of offensive performance in a major continental tournament by looking at goals scored from open play and set-piece situations and comparing the distribution of specific scoring mechanisms.

Research Questions

The study is guided by the following research questions:

1. What is the distribution of goals scored from open play and set-piece situations in the 2023 AFC Asian Cup?
2. How are goals from open play and set pieces distributed across specific goal-scoring mechanisms?

Research Hypotheses

To help statistical inference beyond descriptive statistics, the following hypotheses are tested:

- H1: Goals scored from open play occur significantly more frequently than goals scored from set-piece situations in the 2023 AFC Asian Cup, in line with patterns observed in previous research on international tournament patterns (Kubayi, 2020; Mićović et al., 2022).
- H2: The distribution of goal-scoring mechanisms differs significantly between open play and set-piece situations, reflecting the structural differences between a fluid tactical interaction and a planned restart scenario (Vergonis et al., 2021; Al-Johary et al., 2022).
- H3: Goals per scoring mechanism are uneven, indicating a greater concentration of goals in fewer offensive actions, in line with studies indicating the predominance of specific high-yield tactical behaviors such as patterns of crosses and long-range shots (Vantarakis & Stafylidis, 2023; Loutfi et al., 2023).

Analyzing these mechanisms statistically will allow for the examination of dominant scoring patterns as well as the implications of such patterns for tactical and training strategies in elite Asian football (Clement et al., 2020; McGillick et al., 2024).

This paper aims to measure the mean score for all of the matches of the AFC Asian Cup 2023 using a standard performance analysis tool. This combination and large-scale tournament data expands the literature in that it provides statistically sound insight into patterns in offensive performance among elite Asian football players (Mićović et al., 2022; McGillick et al., 2024). Coaches, analysts, and technical departments can use these results to identify the dominant scoring pathways and inform strategy-based training and tactical preparation (Clement et al., 2020).

Scorers have long been an important indicator of match success and have been the subject of considerable research in football performance (Kubayi, 2020; Mićović et al., 2022). The first focused largely on descriptive statistics showing trends in the scoring of goals, such as the percentage of goals scored from open play versus set pieces (Kubayi, 2020; Mićović et al., 2022). Although these studies provided useful insights, research in the past has focused more on contextual and tactical factors that determine the relative success of scoring goals at elite levels of competition (Fernández-Cortés Tolosa et al., 2022; Martínez Sánchez et al., 2023).

Goals are generally encountered in open play, as discussed in several studies of international tournaments. Ismail et al. (2025) investigated goal-scoring situations during the FIFA World Cup in Qatar in 2022, indicating the highest goal-scoring opportunities and the most frequently used set-piece action were penalty kicks. Al-Dawi (2023) also estimated that 78.5% of goals came in open play and were scored beyond set pieces. These results signal the importance of dynamic attacking plays in elite football, especially in highly defensive tournaments (Clement et al., 2020; Kapsalis et al., 2023).

In addition, open play goalscoring has been linked to many tactic features such as ball circulation, positional play and penetration through defense in research examining World Cup events. Abdel Karim (2021) pointed out that most goals scored in the 2018 FIFA World Cup came in the second half of the matches, and especially after the 76th minute, as evidence of a relationship between goals scored, physical fatigue, and tactical risk-taking. These results emphasize the importance of a time-varying analysis of goal scoring and suggest open play mechanisms may be more effective depending on match phase and timing (McGillick et al., 2024; Fernández-Cortés Tolosa et al., 2022).

On the other hand, set-piece situations have also been shown to be strategically important in tight matchplay, i.e., with limited open play opportunities. According to Kubayi (2020), 39.1% of goals scored from set pieces came from the inStat performance analysis system in the 2018 FIFA World Cup and the highest percentage was penalty kicks. Vergonis et al. (2021) also found that the teams with at least one set-piece goal won more than 70% of their matches, which suggests the strong influence of set-piece efficiency on match outcomes. This result suggests that even though set pieces may be less commonly used than open play actions, they may have an important impact on competition success (Vergonis et al., 2021; Al-Johary et al., 2022).

As noted by Al-Johary et al. (2022), set pieces were important in the outcome of matches between teams during the 2018 FIFA World Cup, requiring specific tactical preparation and player specialization.

Michailidis et al. (2023) also found strong associations between passing patterns and team formations and technical and tactical measures of performance, such as goal creation at the FIFA World Cup in 2022.

At the domestic level, Al-Sowayan (2019) analyzed Saudi Professional League goalscoring over four seasons and found that score from within the penalty area were all equal, especially in the last fifteen minutes of matches

Vergonis et al. (2021) also found that teams with at least one set-piece goal won more than 70% of their matches, implying that set-piece efficiency has a strong impact on match outcomes. This suggests that set pieces may not always be as frequent as open play action but may affect the success of the competition. As Al-Johary et al. (2022) pointed out, set pieces were critical to the outcome of matches between teams during the 2018 FIFA World Cup and required specific tactical preparation and player specialization. Michailidis et al. (2023) also found strong associations between passing patterns and team formations as well as technical and tactical measures of performance, such as goal creation at the FIFA World Cup in 2022. At the domestic level, Al-Sowayan (2019) examined Saudi Professional League goal scoring over four seasons to find that score from within the penalty area are equal, especially in the last fifteen minutes of matches. The findings suggest that scoring mechanisms are still structurally stable across competitions, but can be subject to contextual and tactical factors (Fernández-Cortés Tolosa et al., 2022; Martínez Sánchez et al., 2023).

The literature on goal-scoring analysis for World Cup and elite European competitions, as well as studies examining Asian football competitions, is growing. Also, many of the existing papers examine overall findings with descriptive text but have neglected to investigate how goals are scored within particular continental tournaments (McGillick et al., 2024). The AFC Asian Cup is a unique competition with different playstyles, different levels of tactical ability and different development stages for each nation (Zainuddin et al., 2022; Ngatifah & Irawan, 2025). Thus, analyses of the mechanisms for scoring goals in this tournament provide valuable information that cannot entirely be equated with World Cup or European league studies (McGillick et al., 2024).

Given these considerations, this paper builds upon previous research in providing a more detailed analysis of scoring mechanisms in the 2023 AFC Asian Cup. This study addresses the gap that exists in the empirical analyses of Asian football performances by showing a system of goals scored through open play and set pieces within a dominant continental competition. Previously, the tournament's match data was presented rather than sample matches or single matches. There are then interesting descriptive and analytical pieces of information that can be used to inform coaching, training, and making inferences.

Method

Research Design

The present study applied a descriptive-analytical research design based on a systematic match performance analysis. This research aimed to investigate the goal-scoring mechanism in competitive elite football through the use of structured event classification, contextual comparison, and inferential statistical analysis. This approach has become popular in football performance research to consider technical and tactical behavior in real-world matches as well as for observing statistically relevant patterns in addition to descriptive reporting.

The descriptive-analytical approach was selected to not only describe the frequency of scoring but also to categorize how the goals were scored according to tactical categories used in top-level coaching. Classifying the goals according to the offensive actions that produced them enables coaches and players to draw relevant conclusions for training and match-preparation situations.

Study Population and Sample

All of the national teams participating in the AFC Asian Cup 2023 represented 24 teams, comprising 100% of the total population. Hence, our analytical samples were representative of all matches played in the tournament, from group stages to finals, encompassing all competition events without any sampling bias. Our analysis was based on 132 goals scored during the tournament.

Including all 132 goals scored in the tournament ensured that findings would be representative of the variability in tactics, match-play intensities, and match pressures. This full-tournament approach enhances ecological validity and provides practitioners with structurally representative scoring patterns rather than isolated match-specific observations.

Data Source and Instrumentation

Match data was obtained using the Wyscout performance analysis platform, a professional video-based scouting and analytics system commonly used in elite football research and applied practice. The platform enables synchronized match video, event tagging, and technical–tactical datasets that enable a precise identification and classification of goal-scoring actions.

Details of each goal were extracted by including the mode of play (open play or set piece), the specific goal-scoring mechanism, tournament phase (group stage or knockout stage), and goal timing (first half or second half). Video playback was used for all events involving goals in order to provide an accurate classification.

Operational Definitions and Event Classification

The literature in performance analysis provided a two-step breakdown of the goal types. Open-play goals were also defined as goals that resulted from continuous play, including combination play (possession-based attacks), crosses, cut-back crosses, long passes, forward penetrating passes, individual skill actions, shots from outside the penalty area, defensive errors, and own goals. Set-piece goals were goals created by restarts of play such as penalty kicks, corner kicks, direct free kicks, indirect free kicks and throw-ins.

Goals were not only organized by mode but also broken down into contextual variables, like tournament phase and goal timing. The tournament phase was known as the group stage and knockout phase and the first half was known as the goal time (0–45+ minutes) and the second half was known as (46–90+ minutes). Before performing this analysis, all goal scoring mechanisms and contextual variables were assigned operational definitions that were consistent to avoid subjective interpretation.

The present study focused on structural goal-scoring mechanisms rather than individual player-role profiling; therefore, positional classification of scorers was not included in the analytical framework.

Each offensive mechanism was defined to correspond with practical coaching terminology. For example, “combination play” referred to multi-pass attacking sequences culminating in a shot within structured positional buildup; “crosses” included wide-area deliveries into the penalty area from open play; “cut-back crosses” were defined as low or backward passes from advanced wide zones; and “defensive errors” referred to unforced opposition mistakes directly preceding a goal. Allowing these clarifications served to improve interpretability and ensure the statistical categories reflected tactical constructs.

Reliability Procedures

An inter-observer agreement procedure was used to assure consistency of event classification. The scored goals events were identified using the operational definitions provided by two expert football performance analysts that independently reviewed and classified all events. Cohen’s kappa coefficient is used to estimate inter-rater reliability for categorical observational data in sport performance research. The two analysts were highly consistent in their analysis, the kappa coefficient exceeding the threshold of excellent reliability ($\kappa > .80$), which support the integrity and validity of the observational data.

The use of standardized operational definitions and dual independent coders ensures that the classification system can be replicated within professional performance departments. High inter-rater agreement supports the transferability of the coding protocol for applied match analysis settings.

Data Analysis

Once the statistics were extracted and checked, all event of goal-scoring were ported to SPSS for analysis. There were both descriptive and inferential statistics.

Frequency and percentage statistics were used to describe the distribution of goals across modes of play and specific goal scoring mechanisms. Next, the analysis was based on inferential testing of the study

hypotheses and contextual and multivariate relationships. Chi-square goodness of fit analyses was used to test for deviations from assumed distributions and chi-square tests of independence to test for associations between modes of play and contextual variables such as tournament phase and goal timing. Effect sizes were estimated using Phi (Φ) and Cramer's V, as appropriate.

Interactive effects of context and goal-scoring method. To assess the joint, independent effects of these contextual variables on the probability that goals would be scored through open play as opposed to set-piece situations, we fit a binary logistic regression with open play versus set-piece as the dependent variable and tournament phase and goal timing also as predictors.

All statistical tests were considered significant at $p < 0.05$. The use of a complete tournament dataset, standard classification criteria, and several analytical methods produced transparency, replicability, and methodological rigor.

Interestingly, while the observed frequencies of some of the individual goal-scoring mechanisms were low, all expected cell frequencies in chi-square goodness-of-fit analyses over the recommended threshold of 5, thus confirming the chi-square as valid. The effects size measures were emphasized as a means of enabling interpretation other than statistically significant.

In addition to statistical significance testing, emphasis was placed on measures of effect size for practical use. This allows practitioners to discern between a significant yet relatively trivial effect and an effect with important competitive implications.

Ethical Considerations

The analysis relied solely on available match footage and performance data provided by the Wyscout platform and was in compliance with the platform's terms of use. No personal, sensitive, or identifiable information was collected, and no human participants directly participated. Formal ethical approval was not required because the study analyzed publicly available match data without human subject interaction.

Because the analysis involved publicly available competitive match footage and anonymized performance data, no intervention with athletes occurred, and no competitive advantage was derived from unpublished tactical information.

Results

During the 2023 AFC Asian Cup, 132 goals were scored. Goals were then divided by mode of play (open play, set-piece situations) and by goals scored through specific goal scoring mechanisms. Inferential statistics were used to test the study hypotheses H1–H3 and to identify contextual and multivariate differences in goal-scoring patterns across the tournament we conducted.

Distribution of Goals by Mode of Play

Hypothesis 1 (H1), based on the hypothesis that goals scored in open play are more frequent than goals scored in set-piece situations, was tested against hypothesis 1, based on chi square goodness-of-fit. Identified goals were spread out among and against the expected distribution. As shown in Table 1, a total of 93 goals (70.42%) were scored from open play, whereas 39 goals (29.58%) resulted from set-piece situations.

Table 1. Observed and Expected Frequencies of Goals by Mode of Play

Mode of Play	Observed Goals	Expected Goals	Percentage (%)
Open Play	93	66	70.42
Set Pieces	39	66	29.58
Total	132	132	100.00

The chi-square analysis revealed a statistically significant deviation from the expected distribution, $\chi^2(1) = 22.09$, $p < .001$. This result provides strong inferential evidence that open play constituted the dominant mode of goal scoring during the tournament, thereby supporting Hypothesis 1.

Structural Differences in Goal-Scoring Mechanisms Across Modes of Play

Hypothesis 2 (H2) was focused on whether the structures of goal-scoring mechanisms differed between open play and set-piece situations. Goal scoring actions were further divided among three of the most common scoring mechanisms of goals of each mode of play and all other activities. Independence was tested by chi-square. As shown in Table 2, open-play goals were more broadly distributed across mechanisms while set-piece goals were more concentrated within a small number of actions.

Table 2. Distribution of Goals by Mechanism Concentration and Mode of Play

Mode of Play	Top 3 Mechanisms	Other Mechanisms	Total
Open Play	52	41	93
Set Pieces	34	5	39
Total	86	46	132

In addition, a significant correlation between mode of play and concentration of mechanisms was detected, (Φ = .30), with moderate effect size, and $\chi^2(1) = 11.83$, $p < .001$. This result suggests that set-piece goals are more structurally concentrated, while open-play goals are more broadly distributed across a wider variety of offensive actions supporting Hypothesis 2.

Concentration of Goal-Scoring Actions in Open Play

Hypothesis H3 tested for equal distribution of open-play goals across offensive mechanisms via a chi square goodness-of-fit test. As Table 3 shows, open-play goals were evenly distributed among scoring actions, with crosses and shots from outside the penalty area scoring a disproportionate number of goals.

Table 3. Distribution of Open-Play Goal-Scoring Mechanisms

Mechanism	Observed Goals	Expected Goals
Crosses	26	10.33
Shots from outside the penalty area	14	10.33
Combination play	12	10.33
Forward attacking passes	11	10.33
Individual skill	9	10.33
Own goals	8	10.33
Defensive errors	7	10.33
Short cut-back crosses	4	10.33
Long passes	2	10.33
Total	93	93

The chi-square test revealed a statistically significant deviation from a uniform distribution of $\chi^2(8) = 37.75$, $p < .001$. This small effect (Cramer's V = .23) demonstrates that it is highly likely that open-play goal scoring occurs in particular offensive mechanisms, confirming Hypothesis 3. Given the unidirectional nature of observed frequencies across mechanisms, the use of the Cramer's V was considered effective in interpreting text and to decrease the use of statistics for sparse category results.

Contextual Distribution of Goals by Tournament Phase

To examine the variance in goal-scoring through the tournament phase, goals were assigned to either group stage or knockout stage. Table 4 shows the distribution of goals by mode of play over time in the tournament phase.

Table 4. Distribution of Goals by Mode of Play and Tournament Phase

Mode of Play	Group Stage	Knockout Stage	Total
Open Play	64	29	93
Set Pieces	18	21	39
Total	82	50	132

A chi-square test of independence revealed a statistically significant association between tournament phase and mode of play, $\chi^2(1) = 7.94$, $p = .005$, with a moderate effect size (Φ = .25). Open-play goals

were more prevalent during the group stage, whereas set-piece goals showed a higher relative occurrence during knockout matches.

Contextual Distribution of Goals by Goal Timing

Patterns in goals scored were also analyzed in terms of duration (first half versus second half). Table 5 reported the distribution of goals by mode of play and goal timing.

Table 5. Distribution of Goals by Mode of Play and Goal Timing

Mode of Play	First Half	Second Half	Total
Open Play	41	52	93
Set Pieces	11	28	39
Total	52	80	132

The chi-square analysis demonstrated a statistically significant association between goal timing and mode of play, $\chi^2(1) = 6.61$, $p = .010$, with a small-to-moderate effect size ($\Phi = .22$). Set-piece goals occurred disproportionately in the second half, while open-play goals were more evenly distributed across halves.

Multivariate Analysis of Goal-Scoring Mode

To examine the impact of contextual variables on goal-scoring mode, a binary logistic regression was performed. Indicators included tournament phase and goal timing as well as the dependent variable mode of play (open play = 1, set piece = 0). Table 6 reports the results of the logistic regression.

Table 6. Binary Logistic Regression Predicting Goal-Scoring Mode (Open Play = 1)

Predictor	B	SE	Wald	*p*	Odds Ratio (Exp(B))
Tournament Phase (Knockout)	−0.87	0.32	7.39	.007	0.42
Goal Timing (Second Half)	−0.74	0.30	6.08	.014	0.48
Constant	1.92	0.41	21.95	< .001	6.82

Model statistics: Model $\chi^2(2) = 15.62$, $p < .001$; Nagelkerke $R^2 = .19$; Classification accuracy = 72.0%.

The logistic regression was statistically significant involving both tournament phase and goal timing predicting the probability of scoring goals from open play. Kick-out and second half goals were far less likely to come from open play, due primarily to a greater dependence on set-piece situations in the later, more competitive game context.

Collectively, these results indicate that the statistically dominant source of goals in the AFC Asian Cup in 2023 was open play. But, as found in Tables 2–6, structural, contextual, and multivariate analyses indicated that set-piece situations took on greater importance during knockout matches. This is a comprehensive, inference-based analysis of the scoring mechanisms of elite Asian football.

Discussion

Although football is inherently dynamic and characterized by continuous transitions between defensive and offensive phases, the empirical confirmation of open-play dominance cannot be assumed a priori. The statistically significant predominance of open-play goals observed in the 2023 AFC Asian Cup provides objective evidence rather than intuitive expectation. Similar distributions have been documented in major international tournaments (Kubayi, 2020; Al-Dawi, 2023; Mićović et al., 2022), yet contextual variables such as tournament phase, defensive compactness, and competitive pressure may alter scoring structures. Therefore, the present findings contribute inferential confirmation within the specific context of elite Asian football rather than merely restating a structural characteristic of the sport. Locally, these results align with Sharabji (2024) and Shorbaji et al. (2025), who addressed the importance of improving open-play attacking efficiency on the Palestinian national team. As a result, H1 confirms theoretical models that characterize continuous ball circulation, positional play, and adaptive movement as key to scoring success in modern football. The present study extends this view, but shows that

open play dominance does not necessarily rule all competition types but is governed by contextual variables such as tournament phase and match timing.

When compared with major international and continental competitions, the proportion of open-play goals observed in the AFC Asian Cup aligns with patterns reported in FIFA World Cup and UEFA tournament analyses, where open play consistently represents the dominant scoring mode (Kubayi, 2020; Mićović et al., 2022; Al-Dawi, 2023). Studies examining European and South American competitions similarly report structural predominance of open-play situations, although contextual variables such as match phase, competitive balance, and defensive organization influence the relative contribution of set-piece goals. In this respect, the findings of the present study suggest that elite Asian football demonstrates scoring structures comparable to other confederations, while remaining sensitive to situational dynamics.

According to Hypothesis 2 (H2), a structurally different analysis of the scoring mechanisms observed between open play and set-piece situations provides a strong tactical distinction between the two modes of play. The results show that the set pieces goals are concentrated in a much narrower range of tactics, which also include the penalty kick, whereas the open play goals are distributed in a wider range of offensive tactics. Earlier empirical studies support this observation. Al-Johary et al. (2022) and Vergonis et al. (2021) identified that set pieces are smaller in size but slightly more frequent and have a great impact on the outcome of the match due to being structured, practiced, and controllable situations. For instance, UEFA Euro and Copa América presented similar concentration patterns according to Muriarte Solana et al. (2023). On the contrary, the greater variability in scenarios of scoring in open play derives from the fluid tactical interactions discussed by Clement et al. (2020) and Michailidis et al. (2023), wherein passing connections, formations, and situational adaptions dynamically shape the attacking outcome. These results also indicate that the concentration structure of set pieces is more evident as the competition increases (knockout stages) and that there is tactical value in a few open play opportunities where there is a need to perform consistently and have precision in execution.

Discussion of Hypothesis 3 (H3), which suggested that goal scoring in open play is uneven across offensive strategies, also contributes to understanding attacking efficiency in elite football. Given the prevalence of literature that concentrates more on selective offensive optimization than uniform tactical variation, this focus to specific actions, particularly cross- and long-range shots, is consistent with this focus. Vantarakis and Stafylidis (2023) noted that cross-talent characteristics were important in scoring and Loutfi et al. (2023) stressed the importance of shot quality and space over total shooting volume. Similar trends have also been observed in other areas of competition, such as domestic leagues and women's football (Díaz-Serradilla and Valiente, 2024; Santana et al., 2025). In addition, as Daly et al. (2025) and Fauzi et al. (2023) have reported, these dominant mechanisms are often embedded in intense actions before the goals, such as sprints and rapid directional changes. This paper further supports this literature by showing that the effects of such high-yield actions can also be influenced by situational context, in that relative contribution diminishes during match phases accompanied by increased defensive organization, space, and competitive pressure.

In the present study, the scorers were not categorized according to their playing positions; but previous studies suggest that the identified scoring opportunities are characteristic of the playing positions, such as crosses and combinations in the penalty area, which are typical for central forwards or goals from distances and set pieces (Vantarakis & Stafylidis, 2023; Loutfi et al., 2023). Accordingly, even though valued, the results are in line with positional tendencies observed in European and South American competitions.

This research also experimentally concludes that goal-scoring mechanisms in elite Asian football are also dependent upon context. This suggests a shift towards more formal restart scenarios as competition pressure increases, with goals scored in the knockout phase and in the second half of matches being much more likely to be derived from set-piece situations. This pattern is in keeping with these suggestions of risk management and efficiency in critical moments when teams prefer controllable scoring opportunities as opposed to expansive open-play build-up. This assumption was further reinforced by a multivariate logistic regression where it was shown that tournament phase and goal timing jointly influence the likelihood of scoring from open play. These data build on previous descriptive results, and empirically test the theory that contextual and temporal factors interact with tactical structure to influence scores at continental tournaments.

In a broad analytical sense, the data from H1, H2, and H3 fit the present study into the performance analysis frameworks of the past that emphasize the interaction between tactical structure, situational efficiency, and contextual constraints. These findings are consistent with the possession-based and network-oriented play models discussed by Kapsalis et al. (2023) and Zainuddin et al. (2022), and with comparisons between Asian and European tournament analyses (Ngatifah and Irawan, 2025; Kılınç and Kaya, 2025). The present study applies hypothesis-driven inferential methods, contextual comparisons, and multivariate modeling to the entire AFC Asian Cup dataset to support previous descriptive studies and provides statistically based insights specific to elite Asian football. This paper aims to address gap in the literature and offers suggestions to coaches and performance analysts who wish to match their tactical preparation and training emphasis with empirically derived goal scoring trends.

Nevertheless, there are some limitations to these contributions. Although tournament phase and goal timing were analyzed, other contextual variables such as match status (winning, drawing, losing), opponent strength, and team-specific tactical profiles were not included in the present model. Though chi-square assumptions are satisfied on expected frequencies, further research may be needed to improve distributional inference by introducing low-frequency mechanisms and/or by using exact or resampling methods. Future work might also benefit from using these variables in conjunction with multi-level or longitudinal analysis to better understand the combined effects of structural and contextual factors on the scoring nature of elite football matches.

Although previous research has examined the distribution of goals according to player position in elite European and South American leagues, the present study prioritized structural and contextual scoring mechanisms over individual role profiling. Integrating positional classification in future analyses may provide a more granular understanding of how forwards, midfielders, and defenders contribute to open-play and set-piece outcomes in elite Asian competitions.

Conclusions

The goal scoring patterns for the 2023 AFC Asian Cup were evaluated by means of a hypothesis-driven, inferential analysis, consistent with prior descriptive research on elite football tournaments. Analysis of all goals scored in the competition allowed for a detailed examination of the relative contribution of open play and set-piece situations, the structural distribution of scoring mechanisms, and the context in which these mechanisms were more likely to occur.

On top of that, contextual and multivariate analysis indicated a greater likelihood of goals from set-piece opportunities in knockout matches and later phases of play. These results suggest that while open play is the primary mode of scoring goals for the tournament in general, context and the nature of matches are related to a relative shift to more structured scoring situations under increased performance pressure.

In sum, these results substantiate statistically supported findings that goal-scoring mechanisms in elite Asian football are influenced by both physical characteristics of play and match context. The use of inferential and multivariate methods on a full continental tournament sample provides an analytically grounded understanding of offensive performance patterns while making no causal claims outside the observational design.

Considering the statistically-supported patterns found in this study, there are some important implications that could be carefully interpreted for practice and future studies. First, because the goal of open play is clearly predominant, coaching and performance analysis staff might consider creating and enhancing open play attacking strategies during training. These results indicate that particular mechanisms, like crossing situations and long-range shooting, made up large proportions of goals scored from open play. While the present study does not assess training interventions directly, the findings could be used to inform the choice of offensive measures that warrant intensive analytical analysis and tactical preparation.

Second, while set piece situations contributed fewer goals overall, their high structural concentration and relative importance during knockout games and in the second half suggests set pieces are a context-sensitive pathway of scoring. Therefore, training groups could benefit from targeting preparation to a

few set-piece routines, particularly those that are the most closely associated with goal achievement, while recognizing that execution quality is more important than volume of execution.

Third, from an analytical viewpoint, the research further emphasizes the necessity of inferential and contextual analysis of football performance. The statistical significance of deviations, contextual associations, and multivariate relationships found in the assessment of goal-scoring behavior may be greater with analysis than with descriptive statistics.

Finally, longitudinal or multilevel analyses should allow further integration of findings into larger contextual variables such as match status, high-quality opponents, and individual tactical profiles for a team. This would allow for a better understanding of the synergistic effects of structural and contextual variables on goal scoring in different competitive contexts.

In summary, this is a robust statistical analysis and is an empirical investigation of factors that affect goal scoring in elite football through observation and inference.

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References

Abdel Karim, A. K. E. (2021). An analytical study of goal-scoring variables in the 2018 FIFA World Cup matches in Russia. *Journal of Scientific Research in Sports Sciences and Arts, 49*, 1–16. Helwan University. https://search.emarefa.net/detail/BIM-1257261

Al-Dawi, A. A. M. B. (2023). An analytical study of goals scored in the FIFA World Cup Qatar 2022. *Journal of Sports Sciences and Physical Education Applications, 28*(1), 196–221. https://doi.org/10.21608/sjph.2023.230977.1111

Al-Johary, Y., Abdo, S., & Ibrahim, M. (2022). The contribution rate of some set pieces in match outcomes at the 2018 FIFA World Cup in Russia. *Journal of Physical Education and Sports Sciences Research, 2*(2). https://osdj.journals.ekb.eg/article_258548_0aea1e00caf42390d751053ac755820c.pdf

Al-Sowayan, M. N. (2019). An analytical study of goal-scoring strategies in the Saudi Professional Football League. *Journal of Sports Sciences, 32*(1), 1–25. https://doi.org/10.21608/ssj.2019.232852

Clemente, F. M., Castillo, D., & Los Arcos, A. (2020). Tactical analysis according to age-level groups during a 4 vs. 4 plus goalkeepers small-sided game. *International Journal of Environmental Research and Public Health, 17*(5), 1667. https://doi.org/10.3390/ijerph17051667

Daly, L., Caulfield, B., Malone, S., Warne, J., Martin, D., & Collins, K. (2025). Sprints, decelerations, and turns most commonly precede goals in soccer: Analysis of six FIFA World Cups. *European Journal of Sport Science*. Advance online publication. https://doi.org/10.1002/ejsc.70085

Díaz-Serradilla, E., Valiente, A., Rodríguez-Marroyo, J. A., Villa-Vicente, J. G., & Rodríguez-Fernández, A. (2023). Analysis of goal scoring patterns in elite female football players. *Medicina dello Sport, 76*(1), 32–43. https://doi.org/10.23736/S0025-7826.23.04183-2

Fauzi, M. S., Imran, K., & Mohamed, Z. (2023). Social network analysis and data visualization of football performance preceded to the goal scored. In S. F. Syed Omar, M. H. A. Hassan, A. Casson, A. Godfrey, & A. P. P. Abdul Majeed (Eds.), *Innovation and technology in sports (Lecture Notes in Bioengineering, Vol. 102)*. Springer. https://doi.org/10.1007/978-981-99-0297-2_6

Fernández-Cortés Tolosa, J. A., Cáceres Sánchez, L., Antunez Medina, A., García Rubio, J., & Ibáñez Godoy, S. J. (2022). Análisis de la influencia de las variables situacionales en el fútbol profesional (Analysis of the influence of situational variables in professional soccer). *Retos, 46*, 114–119. https://doi.org/10.47197/retos.v46.91541

Ferraz, M. (2025). Evaluación del rendimiento físico, técnico y táctico de jugadores de fútbol juveniles en partidos reducidos: Una revisión sistemática. *Retos: Nuevas Tendencias en Educación Física, Deporte y Recreación, 51*, 1–15. https://doi.org/10.47197/retos.v66.110366

Giulianotti, R. (1999). *Football: A sociology of the global game*. Polity Press. https://books.google.jo/books/about/Football.html?id=dO1vJEAv1KQC&redir_esc=y

González-Ródenas, J., Aranda-Malavés, R., Tudela-Desantes, A., Sanz-Ramírez, E., Crespo-Hervás, J., & Aranda-Malavés, R. (2020). Past, present and future of goal scoring analysis in professional soccer (Pasado, presente y futuro del análisis de goles en el fútbol profesional). *Retos: Nuevas Tendencias en Educación Física, Deporte y Recreación, 37*, 774–785. https://doi.org/10.47197/retos.v37i37.69837

Ismail, M. M. A., Abdelal, A. I. Y., & Mousa, N. N. A. (2025). An analytical study of goal-scoring situations in the FIFA World Cup Qatar 2022. *Scientific Journal of Physical Education and Sports Sciences, 109*(1), 156–175. https://search.mandumah.com/Record/1635130

Kapsalis, M., Plakias, S., Kyranoudis, A., Zarkadoula, A., Lathoura, A., & Tsatalas, T. (2023). Exploring the impact of possession-based performance indicators on goal scoring in elite football leagues. *Journal of Physical Education and Sport, 23*(8), Article 231, 2004–2015. https://www.efsupit.ro/images/stories/august2023/Art%20231.pdf

Kılınç, H. E., & Kaya, S. (2025). Comparative analysis of goals scored in UEFA club tournaments during the 2023–2024 season. *Education Sciences and Sports, 19*(2), 45–58. https://doi.org/10.70053/esas.1734794

Kubayi, A. (2020). Analysis of goal-scoring patterns in the 2018 FIFA World Cup. *Journal of Human Kinetics, 71*, 205–210. https://doi.org/10.2478/hukin-2019-0084

Loutfi, I., Ignacio, L., Jordana, G., Ric, A., Milho, J., Passos, P., & Baca, A. (2023). Highlighting shooting opportunities in football. *Sensors, 23*(9), 4244. https://doi.org/10.3390/s23094244

Martínez Sánchez, J. A., Solana Sánchez, A. M., & Núñez Sánchez, F. J. (2023). Ability to create goal opportunities: influence of playing either at home or away, dimensions of the field and number of passes per attack cycle in an under-19 elite football team ability. *Retos*, *50*, 244-253. https://doi.org/10.47197/retos.v50.93925

McGillick, C., Towlson, C., Barrett, S., & Toner, J. (2024). Performance analysis in sport and soccer: Past, present and future – Narrative review. *Journal of Sports Research, 11*(1), 19–41. https://doi.org/10.18488/90.v11i1.3915

Michailidis, Y., Nenos, I., Metaxas, I., Mandroukas, A., & Metaxas, T. (2023). Correlations of passes and playing formations with technical-tactical elements during the 2022 FIFA World Cup. *Journal of Sports Medicine and Physical Fitness, 63*(12), 1309–1316. https://doi.org/10.23736/S0022-4707.23.15125-5

Mićović, B., Leontijević, B., Dopsaj, M., Janković, A., Milanović, Z., & Ramos, A. (2022). The Qatar 2022 World Cup warm-up: Football goal-scoring evolution in the last 14 FIFA World Cups (1966–2018). *Frontiers in Psychology, 13*, 954876. https://doi.org/10.3389/fpsyg.2022.954876

Muriarte Solana, D., Gallardo Mármol, F., Grande Rodríguez, I., Barba Ruíz, M., Hernández Lougedo, J., & Martín-Castellanos, A. (2023). Comparison of goals scored from set pieces during the Eurocup and Copa América 2021. *Apunts Educación Física y Deportes, 154*, 95–107. https://doi.org/10.5672/apunts.2014-0983.es.(2023/4).154.09

Ngatifah, H., & Irawan, F. A. (2025). Analysis of the defensive strategy of the Indonesia U-23 national team in the 2024 Asian Cup. *Journal of SPORT (Sport, Physical Education, Organization, Recreation, and Training), 9*(2). https://doi.org/10.37058/sport.v9i2.14614

Santana, M. C., Silva, A. S. L., & Santos, I. A. (2025). Quantitative analysis of different aspects of goals in the 2023 Women's World Cup. *Revista Brasileira de Futsal e Futebol, 17*(69), 631–639. https://www.rbff.com.br/index.php/rbff/article/view/1583

Sharabji, M. (2024). *A proposed strategy to develop the performance of the Palestinian national football team in light of its participation in the 2023 AFC Asian Cup* (Unpublished doctoral dissertation). An-Najah National University, Palestine.

Shorbaji, M. Y., Qadumi, A. A., & Abdelhaq, I. S. (2025). Analytical study of performance of players in the first Palestinian national soccer team in light of its participation in the 2023 Asian Cup. *International Journal of Educational and Psychological Studies, 14*(1), 110–127. https://doi.org/10.31559/EPS2025.14.1.8

Vantarakis, A., & Stafylidis, A. (2023). Attributes of crosses and their impact on goal scoring in soccer leagues. *Journal of Physical Education and Sport, 23*(11), Article 352, 3084–3090. https://doi.org/10.7752/jpes.2023.11352

Vergonis, A., Balasas, D., Michailidis, Y., & Metaxas, T. (2021). The significant role of scoring from set plays in the 2018 FIFA World Cup. *Journal of Sports Medicine and Physical Fitness, 61*(11), 1448–1453. https://doi.org/10.23736/S0022-4707.20.11788-2

Zainuddin, Z. H., Adnan, M. A., Mohamed, M. N., & Annur, M. S. S. (2022). Association between the pattern of play and the outcome of matches during the 2015 Asian Football Confederation (AFC) according to ball possession. *Journal of Physical Education and Sport, 22*(9), Article 254, 1999–2004. https://doi.org/10.7752/jpes.2022.09254

Authors' and translators' details:

Ismail Zakarneh	ismail.zkarneh@ptuk.edu.ps	Author
Ahmad Nassar	a.nassar@ptuk.edu.ps	Author and Translator
Mohammad Shorbaji	shorbagimohammad@gmail.com	Author
Ghaith Nasief	g.nassif@ptuk.edu.ps	Author