

The impact of increasing substitutions from 3 to 5 on football team performance

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Abstract:

Problem Statement: The five-substitution rule has become one of the most relevant regulatory changes in modern football, particularly after the COVID-19 pandemic. Although initially introduced to reduce player overload during congested match schedules, this rule has also influenced tactical decisions, match intensity, and the role of substitute players. **Approach:** This study used a mixed-methods approach, combining the analysis of publicly available match data with evidence from scientific literature and official competition reports. The analysis focused on the contribution of substitute players, goal involvement, match timing, and tactical implications before and after the introduction of the five-substitution rule. **Purpose:** The aim of this study was to analyze the impact of increasing the number of substitutions from three to five on football team performance, with particular attention to substitute players' contribution, final-stage match dynamics, and tactical flexibility. **Results:** The findings suggest that substitute players have become increasingly important in modern football. Their contribution to goals and assists has increased across recent seasons, while additional substitutions appear to support the maintenance of match intensity, especially in the final stages of the game. The results also indicate that the five-substitution rule provides coaches with greater tactical flexibility, although it may offer additional advantages to teams with deeper squads. **Conclusions:** The five-substitution rule represents an important development in football regulation. It supports player workload management and increases tactical options for coaches, while also strengthening the role of substitute players in decisive match moments. However, its impact should be interpreted with caution, as the relationship between substitutions and match outcomes reflects associations rather than direct causality.

Key Words: match dynamics; coaching strategies; squad management; competitive balance; elite soccer

Introduction

Football, one of the most popular sports in the world, is in a continuous state of evolution, both from the perspective of the game itself and its regulations. A significant change in the regulation of this sport was the adoption of a measure that allows the increase in the number of substitutions during a match from three to five. Initially introduced temporarily by the International Football Association Board (IFAB) in 2020 as a response to the challenges of the COVID-19 pandemic, this rule was later extended and permanently implemented in many competitions.

This modification has had a notable impact on the dynamics of the game, influencing coaching tactics, the management of players' physical effort, and even the competitive balance between large and small teams. The introduction of two additional substitutions provides coaches with greater strategic flexibility, but also raises questions regarding the long-term effects on team performance and game quality.

The purpose of this paper is to analyze in depth the impact of increasing the number of substitutions on football team performance. The study aims to identify the tactical changes generated by this rule, evaluate the effects on players' physical condition, and examine its influence on competitive results. The analysis is supported by statistical data collected before and after the adoption of the new rule, complemented by representative case studies. Therefore, this paper examines the contribution of substitute players to team performance, with particular attention to goal involvement, match intensity in the final stages, and the tactical flexibility offered by the five-substitution rule.

Through this research, we aim to contribute to a better understanding of the implications of regulatory changes in modern football and to provide useful perspectives for coaches, sports officials, and researchers in the field. The possibility of substituting players during a football match was one of the most important reforms in the regulation of football in the second half of the 20th century. The English introduced player substitutions for injury-related reasons during the 1965–1966 season, and this practice spread to other competitions in the following years, especially after FIFA regulated it at the 1970 World Cup.

Thus, following the regulation of the new framework, two substitutions were allowed, managed at the discretion of the coaches. In 1994, FIFA introduced an additional substitution for goalkeepers in case of injury, through the 2+1 rule, but this system did not last, and one year later it was replaced by the new substitution system, allowing three substitutions in any position on the field (Varela-Quintana et al., 2006).

Starting from March 2020, football seasons were interrupted worldwide in order to prevent the spread of the coronavirus (COVID-19). All leagues resumed activity after a few weeks of pause, which led to overlaps in their annual calendars. Due to this overlap, the competition schedule became very congested (for example, five matches within 14 days), resulting in significant accumulated fatigue among players and an increased risk of injuries.

To minimize player overload and potential physical problems, Fédération Internationale de Football Association (FIFA) implemented and approved a new rule, increasing the number of substitutions from 3 to 5 players per match for each team (Martín-Castellanos et al., 2023).

The introduction of the five-substitution rule has generated considerable interest among researchers investigating its effects on player performance, match dynamics, and coaching strategies. Leite and Figueiredo (2020) argued that increasing the number of substitutions may contribute to reducing accumulated fatigue during congested competition schedules, while simultaneously allowing coaches to better manage player workload. Similarly, Meyer and Klatt (2021) highlighted the importance of regulatory adaptations in maintaining player welfare during periods characterized by increased fixture density and physical demands. More recently, Kalkan et al. (2025) reported that the five-substitution rule has influenced both tactical decision-making and squad utilization, providing coaches with greater flexibility to respond to match-specific situations. Together, these findings suggest that the increase in the number of substitutions may have consequences that extend beyond injury prevention, affecting tactical behavior, match intensity, and overall team performance.

In football, players generally perform intermittent activity, although they operate at low intensity for more than 70% of VO₂max. This is partly explained by the 150–250 short and intense actions performed by elite players during a match, which demonstrate the high consumption of creatine phosphate (CP) and glycolysis. Muscle glycogen is probably the most important factor in energy production, and fatigue, especially towards the end of the match, is mainly caused by glycogen depletion in muscle fibers (Bangsbo et al., 2006).

Between 1986 and 2014, 35% of men's football matches at the FIFA World Cup required extra time. At the 2002 World Cup, 25% of matches required extra time (120 minutes), increasing to 38% in 2006 and reaching 50% in 2014. As a result, extra time can determine both success and failure in these final tournaments. Consequently, football professionals have recognized that fatigue responses in performance represent an important area for future research.

The most affected players are those participating in major tournaments such as the FIFA World Cup, the European Championship, Copa América, and the Africa Cup of Nations, as they are significantly exposed to maximal fatigue and a high risk of injury (Kołodziejczyk et al., 2021).

Football has a high injury rate compared to many other sports, with most injuries occurring during matches and a smaller proportion during training. These are caused by multiple factors, such as increased physical demands (contacts and collisions with opponents) and accumulated fatigue (competition against opponents). This leads to an increased incidence of injuries towards the end of halves and matches. Therefore, despite the comprehensive preparation of players (training, nutrition, recovery, recreation), better regulation management is essential in order to support players and prevent injuries (Mota et al., 2020).

This study aims to identify the actual effects of substitutions on team performance and to analyze the impact of increasing the number of substitutions from 3 to 5 in a football match. Studies analyzing the effects of substitutions on performance show that they depend on several variables, such as match conditions, ball possession, shots, ball recoveries, and positional roles.

Substitutions have been analyzed according to several aspects: the minute in which the substitution occurred, the number of substitutions, yellow cards, playing positions of the players entering and leaving the field, possession percentage, and match outcome. Results show that, in most cases, the first and second substitutions occur in the second half, between minutes 60 and 90, while the third substitution usually takes place after minute 75 until the end of the match.

It was also observed that when teams were losing, substitutions were made earlier compared to situations when teams were leading or drawing, and home team coaches tended to make substitutions earlier than away team coaches. Most substitutions involved midfield players (57.1%), followed by forwards (27.1%). All these substitutions made by coaches as part of their strategy can influence both the tactical structure of the game and the final result (Gómez et al., 2016).

Aim

The main aim of this paper is to analyze the impact of increasing the number of substitutions from 3 to 5 on the performance of football teams, with a focus on the tactical, physical, and competitive dimensions. Through this analysis, the study aims to provide a detailed perspective on how this regulatory change influences coaching strategies, player workload management, and competitive results. At the same time, the paper seeks to identify differences between teams with large squads and extensive resources compared to those with more limited squads, highlighting the possible implications for competitive balance.

By using statistical analysis and relevant case studies, the study evaluates to what extent this measure has contributed to improving the quality of the game, reducing the risk of injuries, and increasing tactical flexibility. The results obtained aim to contribute to a better understanding of the effects of this rule on modern football and to provide practical recommendations for coaches, sports officials, and researchers interested in the impact of regulations on sports performance.

Hypothesis

The increase in the number of substitutions from 3 to 5 in football matches has had a significant impact on game dynamics, team performance, and the tactical strategies adopted by coaches.

Through this study, we aim to observe the impact of this change by analyzing the following factors:

1. Improvement of game quality, by reducing player fatigue and maintaining a high intensity throughout the match.
2. Reduction of injury risk, due to the possibility of more efficient management of players' physical resources.
3. Increase in coaches' tactical flexibility, offering more options for adjusting strategies depending on match development.
4. Advantage for teams with larger squads and greater financial resources, which may increase competitive imbalance in certain leagues.

This complex hypothesis reflects both the positive aspects and the challenges generated by the increase in the number of substitutions, contributing to a broader understanding of how this change has influenced sports performance and competition dynamics.

The hypothesis suggests that the implementation of the five-substitution rule has not only influenced tactics and results in football but has also led to significant changes in team management and in the approach to competitions.

Material & methods

To analyze the impact of increasing the number of substitutions from 3 to 5 on football team performance and coaching strategies, a mixed methodology is used, combining quantitative and qualitative research.

Research method

- Quantitative research: Analysis of statistical data from competitions conducted before and after the implementation of the new rule (number of substitutions made, timing of substitutions, final results, injuries, and match intensity).
- Qualitative research: Analysis of scientific literature, public reports, and expert perspectives regarding tactical adaptations and the impact of additional substitutions.

Data collection

Data sources:

- Sports statistics platforms (Opta, StatsPerform, Wyscout)
- Match archives from major European leagues
- Academic studies and specialized articles
- Public statements and analyses from coaches in sports media

Period of analysis:

- Comparison of seasons from relevant competitions before and after the introduction of the five substitutions (e.g., 2018–2019 and 2020–2022)

Methods of analysis

Statistical analysis:

- Comparison of the number of substitutions made and their distribution according to match minutes, as well as their impact on match outcomes
- Evaluation of the relationship between the number of substitutions and injury reduction or team physical performance
- Correlation between additional substitutions and the number of goals scored or conceded in the final minutes of matches

Tactical analysis:

- Case studies on representative matches to highlight tactical adjustments made by coaches in the context of five substitutions
- Identification of trends in the use of substitutions (defensive, offensive, hybrid strategies)

Limitations of the study

- Limited access to detailed professional databases and official match reports may have restricted the depth of the statistical analysis.
- Differences between national leagues regarding the implementation and effectiveness of the substitution rule
- The study identifies associations between the five-substitution rule and performance indicators, but it does not establish direct causality.

This methodology allows for a comprehensive evaluation of how the regulatory change has influenced both team performance and coaching decisions, providing relevant conclusions for modern football.

Results

The analysis of data from the Premier League highlights a significant increase in the contribution of substitute players to team performance over time. Specifically, the percentage of goals scored by substitutes across different seasons shows a clear upward trend (Figure 1).

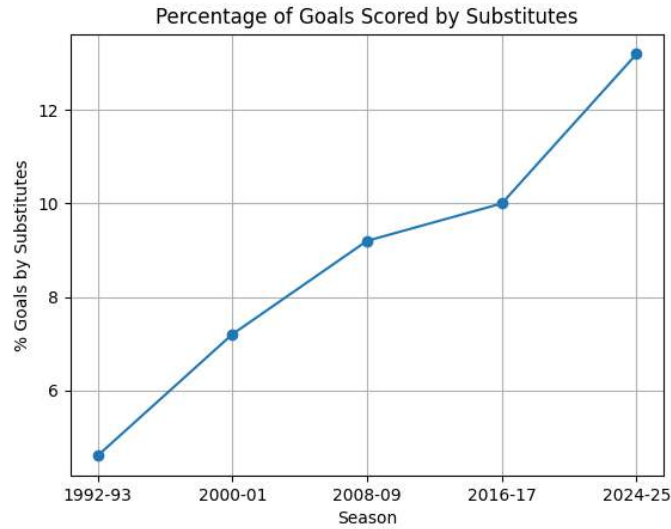


Figure 1. Percentage of goals scored by substitute players across seasons

This percentage increased from 4.6% in the 1992–1993 season to 13.2% in the 2024–2025 season, indicating the growing importance of substitute players in modern football. This evolution is closely associated with recent regulatory changes, particularly the introduction of the five-substitution rule.

Furthermore, the implementation of this rule has had a direct impact on offensive output from the bench. The number of goals scored by substitute players increased from 102 in the 2021–2022 season to 132 in the first season after the introduction of the new rule, with a further increase observed in the 2023–2024 season. The analysis of match timing also reveals important changes in goal distribution. The number of goals scored in the final five minutes of matches has increased across recent seasons (Figure 2), highlighting the growing importance of the closing stages of the game.



Figure 2. Goals scored in the last five minutes of Premier League matches

This trend suggests that the availability of additional substitutions allows coaches to introduce players capable of maintaining high intensity and exploiting defensive weaknesses in the final minutes of matches. In addition, the contribution of substitute players in terms of goal involvement (goals and assists) has become increasingly significant. Data from the 2023–2024 Premier League season show that several teams recorded high levels of goal contributions from substitute players (Figure 3), confirming their growing tactical importance.

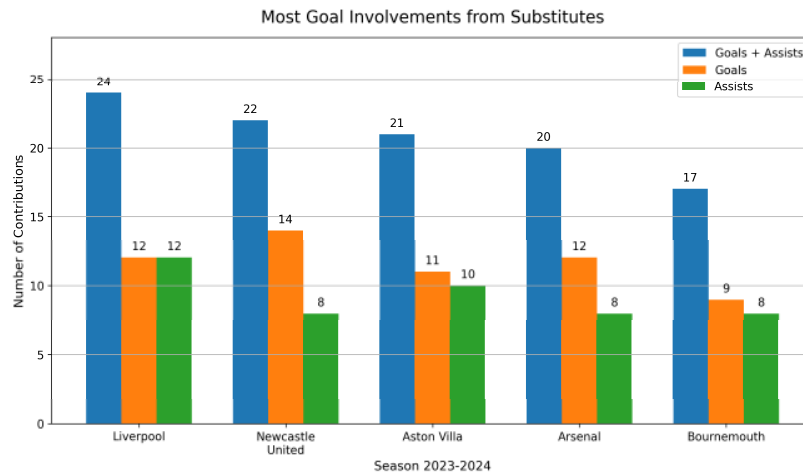


Figure 3. Goal involvement of substitute players in the 2023–2024 Premier League season

These findings indicate that substitute players are not only used to maintain performance levels but also to generate decisive offensive actions that directly influence match outcomes.

At the international level, similar patterns were observed during UEFA EURO 2024. The analysis shows that a considerable proportion of goals involved substitute players, emphasizing their impact in decisive match situations.

The data suggest that in matches ending in victory, substitutions tend to occur later in the game (around the 73rd minute), while in drawn matches they occur earlier (around the 56th minute) (Figure 4).

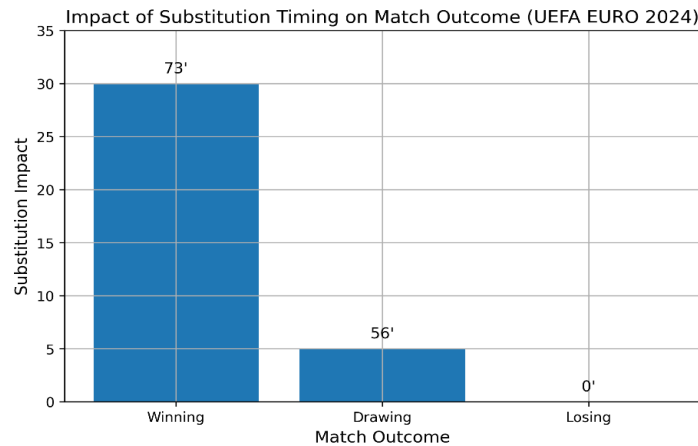


Figure 4. Substitution timing across match outcomes at UEFA EURO 2024

Overall, substitute players contributed to approximately 30% of total goals, including both goals and assists. Comparative analysis with previous tournaments (e.g., UEFA EURO 2016) highlights a significant increase in their contribution, where involvement was approximately 17.6%.

Moreover, a large proportion of goals were scored in the final stages of matches, particularly after the 80th minute, reinforcing the importance of substitutions in decisive phases of the game.

Overall, the results indicate that increasing the number of substitutions from 3 to 5 has had a significant impact on football performance by enhancing the contribution of substitute players, influencing match outcomes in the final stages, improving tactical flexibility, and supporting the maintenance of high physical intensity throughout matches.

Discussion

The aim of this study was to analyze the impact of increasing the number of substitutions from 3 to 5 on football team performance. The results suggest that the five-substitution rule has influenced match dynamics, mainly by increasing the role and contribution of substitute players in decisive moments of the game. The findings indicate that substitutes are increasingly involved in offensive actions, particularly goals and assists, and that their influence is especially visible in the final stages of matches.

The results of the present study are consistent with previous research showing that substitute players can have a significant influence on match performance. Pan et al. (2023) analyzed professional soccer substitute players and found that they displayed higher high-intensity running distance and sprint distance compared with

players who were replaced or completed the entire match. Moreover, their study showed that the impact of substitutes differs according to playing position, with offensive substitutes contributing more to passing, organizing, and scoring actions, while defensive substitutes had a stronger contribution to defensive indicators. These findings support the idea that substitutes do not only help maintain physical intensity but can also influence the technical and tactical dimensions of the game.

Similar evidence was reported by Wang and Zhai (2025), who observed that substitute players maintained higher running performance indicators during the FIFA World Cup, particularly in high-intensity actions. Likewise, Bagattini et al. (2025) found that teams benefited from additional substitutions through improved physical outputs and a greater capacity to sustain match intensity during the final stages of play.

Similarly, Lorenzo-Martínez et al. (2020), in a study conducted on German Bundesliga players, found that substitute players showed higher total distance covered, number of sprints, and fast runs relative to playing time compared with both players who completed the entire match and those who were replaced. Their results also showed that substitute players in midfield and attacking positions displayed higher involvement in technical actions such as possession, touches, and shots. This is relevant for the present study, as it supports the idea that substitutes can bring an additional physical and offensive contribution, especially when introduced in the second half of the match. Recent studies have confirmed that substitute players contribute not only through physical performance but also through technical effectiveness. Chen and Chen (2025) reported that substitute players were increasingly involved in key offensive actions under the five-substitution rule, while Chen et al. (2025) identified substitution timing and player quality as dominant factors influencing substitution effectiveness.

The findings are also supported by the scoping review conducted by Martinho et al. (2026), which highlighted that substitutions in elite soccer usually occur at half-time or during the second half and are generally associated with greater relative physical outputs, including total distance, high-intensity running, and sprinting. The same review also emphasized that late substitutions may be associated with more favorable match outcomes, although the authors underline that the evidence regarding technical, tactical, and physiological consequences remains limited. This observation is important for the present study, because it confirms both the relevance of substitutions and the need for more multidimensional analyses.

The growing importance of substitutions has also been highlighted by Xiao and Zhang (2024), who demonstrated that coaches adapted their substitution strategies following the introduction of the five-substitution rule. Their findings indicated a greater use of tactical substitutions designed to influence match momentum rather than merely replace fatigued players. In relation to the results of the present study, the increase in goals scored by substitute players across different seasons suggests that their role has become more important in modern football. The possibility of making five substitutions instead of three gives coaches more tactical options and allows them to introduce fresh players in key moments of the match. This may help teams maintain a higher level of intensity, especially in the second half, when fatigue usually becomes more visible. García-Aliaga et al. (2023) reported that increasing the number of substitutions helped maintain physical performance during congested fixture periods. Their results support the present findings, suggesting that additional substitutions may reduce the negative effects of fatigue while preserving match intensity throughout the game.

From a tactical perspective, the five-substitution rule allows coaches to adapt more effectively to the evolution of the game. Substitutions can be used to increase offensive pressure, protect a favorable result, change the tactical structure, or respond to the opponent's strategy. This tactical flexibility is particularly important in modern football, where match tempo is high and in-game adjustments are often decisive. Similar conclusions were reached by Mohandas et al. (2023), who argued that substitutions should be viewed as an important tactical resource in modern football. According to their analysis, additional substitutions provide coaches with more opportunities to alter tactical structures and respond to changing match situations.

The findings regarding goals scored in the final minutes of matches also suggest that substitutes may have a stronger impact when the physical level of starting players begins to decline. This supports previous research indicating that substitute players often produce higher-intensity actions relative to their playing time (Lorenzo-Martínez et al., 2020; Pan et al., 2023). In this context, the contribution of substitutes should be understood not only as a physical advantage but also as a strategic resource that can influence the final result. Evidence from international competitions further supports this interpretation. Wei et al. (2024) reported that substitute players had a growing influence on decisive moments during major tournaments, particularly in matches extending into the later stages. Their findings reinforce the present observation that additional substitutions contribute to offensive productivity and match outcomes.

However, the results must be interpreted with caution. The association between substitutions and match outcomes does not necessarily imply direct causality. For example, later substitutions may be observed more often in winning situations because coaches delay changes when the team is performing well, while earlier substitutions may occur when teams are drawing or losing and need to change the course of the match. Therefore, the timing of substitutions should be interpreted in relation to match context, tactical intentions, and score-line.

Another important aspect concerns competitive balance. Although the five-substitution rule can help reduce fatigue and protect players' health, it may also favor teams with deeper squads and greater financial resources. Clubs with stronger benches can introduce high-quality players without reducing team performance,

while smaller teams may not benefit from the rule to the same extent. This issue is important because it shows that the rule has both positive effects and possible competitive disadvantages. However, some authors have raised concerns regarding competitive balance. Iglesias et al. (2022) suggested that teams with deeper squads may benefit disproportionately from additional substitutions, as they are able to introduce high-quality players without substantially reducing performance levels.

This observation is consistent with the concerns identified in the present study.

Overall, the present study supports the idea that increasing the number of substitutions from 3 to 5 has changed the role of substitute players in football. Substitutes are no longer used only to replace tired or injured players, but have become important tactical tools. Their contribution to goals, assists, high-intensity actions, and match outcomes confirms that substitutions are now a central element of modern football strategy.

Previous research conducted by the authors also demonstrated that tactical interventions can significantly influence football performance. Buda et al. (2021) showed that advanced pressing strategies were associated with increased attacking productivity and improved competitive outcomes. In a similar manner, the present findings indicate that the five-substitution rule provides coaches with additional opportunities to implement tactical adjustments capable of influencing match performance.

Conclusions

The present study examined the impact of increasing the number of substitutions from three to five on football team performance and game dynamics. The findings indicate that this regulatory change has had a meaningful influence on modern football by enhancing the contribution of substitute players, supporting the maintenance of physical intensity, and providing coaches with greater tactical flexibility throughout matches.

The results suggest that substitute players have become increasingly important in determining match outcomes. Their growing involvement in goals, assists, and decisive offensive actions highlights the strategic value of effective squad management. The possibility of introducing additional fresh players enables teams to better cope with fatigue, maintain high-intensity performance, and respond more effectively to changing match situations, particularly during the final stages of games.

From a practical perspective, the five-substitution rule offers coaches a wider range of tactical options. Additional substitutions can be used to increase attacking pressure, preserve a favorable score, reinforce defensive stability, or adapt the team structure according to the opponent's strategy. Consequently, substitutions have evolved from a simple replacement mechanism into an essential component of modern football strategy.

The findings also suggest that the rule may contribute to reducing the physical burden placed on players during congested competition schedules, potentially lowering fatigue-related performance decline and supporting player welfare. This aspect is particularly relevant in elite football, where fixture congestion and physical demands continue to increase. However, the study also highlights potential challenges associated with the rule. Teams with deeper squads and greater financial resources may benefit more from additional substitutions, which could contribute to competitive imbalance in certain competitions. Therefore, while the rule provides several sporting and welfare-related advantages, its broader effects on competitive equality should continue to be monitored. Overall, the increase from three to five substitutions represents a significant evolution in football regulations. It has enhanced tactical flexibility, strengthened the role of substitute players, and contributed to maintaining match intensity and performance levels. Future research should further investigate the long-term effects of this rule on player health, competitive balance, tactical behavior, and team performance across different football competitions and levels of play.

Conflicts of interest The authors declare no conflicts of interest.

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Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work, the authors used ChatGPT (OpenAI) to support language editing, text refinement, and improvement of academic writing style. After using this tool, the authors carefully reviewed, revised, and edited the content as needed and take full responsibility for the content of the publication.

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