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Technical-Tactical and Physical Performances of Football Players in Different Formations and Positions: A Systematic Review

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Abstract

Recent studies have shown that the technical-tactical and physical performance metrics of football players in different formations and positions significantly influence match outcomes. The aim of this systematic review is to examine and synthesize current literature on the technical-tactical and physical performances of players in various formations and positions. The systematic search was conducted based on PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines using electronic databases including Web of Science, Scopus, SportDiscus, and PubMed. A total of 98 studies were screened, and 21 studies meeting the inclusion criteria were evaluated in detail. The findings indicate notable differences in performance metrics based on player positions. Significant variations were observed in the total distance covered and high-intensity running depending on the position. Moreover, team length and width were found to impact both running and technical-tactical performance. Players in three-defender formations covered more distance and performed more high-intensity runs compared to those in four-defender systems. Fullbacks in four-defender formations exhibited higher total running distances and high-intensity efforts than their counterparts in five-defender setups. Teams with greater ball possession demonstrated higher physical, technical, and tactical performance metrics. Consequently, the adoption of different technical and tactical strategies results in varying physical demands, influencing player performance at both the team and positional levels.

Keywords: Football, Formations, Positions, Technical-tactical performance, Physical performance

Futbolda Farklı Formasyon ve Pozisyonlarda Oynayan Oyuncuların Teknik-Taktik ve Fiziksel Performanslarının Analizi: Sistematik Bir Derleme

Özet

Günümüzde yapılan birçok araştırma, futbolda farklı formasyonlarda ve pozisyonlarda oynayan oyuncuların teknik-taktik ve fiziksel performans ölçütlerinin maç sonuçlarını önemli ölçüde etkilediğini ortaya koymuştur. Bu sistematik derleme çalışmasının amacı, farklı formasyon ve pozisyonlarda oynayan futbolcuların teknik-taktik ve fiziksel performanslarına ilişkin güncel literatür çalışmalarını inceleyerek bütüncül bir değerlendirme sunmaktır. Sistematik tarama süreci, PRISMA (Sistematik İncelemeler ve Meta-analizler için Tercih Edilen Raporlama Öğeleri) yönergeleri doğrultusunda, elektronik veri tabanları (Web of Science, Scopus, SportDiscus ve PubMed) kullanılarak gerçekleştirilmiştir. Literatürde toplam 98 çalışma incelenmiş, belirlenen kriterlere uyan 21 çalışma değerlendirmeye alınmıştır. Bulgular, oyun pozisyonları arasında teknik-taktik ve fiziksel performans ölçütlerinde anlamlı farklılıklar olduğunu göstermiştir. Farklı pozisyonlarda oynayan oyuncuların kat ettiği mesafe ve yüksek şiddetli koşu performanslarında belirgin değişiklikler gözlenmiştir. Ayrıca, takım boyu ve genişliğinin koşu ile teknik-taktik performansı etkilediği, üçlü savunma formasyonundaki oyuncuların dörtlü savunmadakilere göre daha fazla mesafe kat edip daha yüksek şiddetli koşular gerçekleştirdikleri belirlenmiştir.

Dörtlü savunmada görev yapan full beklerin, beşli savunmadaki oyunculara kıyasla daha yüksek koşu mesafesi ve şiddetli koşu sergiledikleri; topa sahip olan takımların teknik ve taktik performanslarının yanı sıra kat edilen mesafe açısından daha yüksek çıktılar sundukları tespit edilmiştir. Bu nedenle, benimsenen teknik/taktik stratejilerin oyuncular üzerinde farklı fiziksel taleplere neden olduğu ve bu stratejilerin hem takım hem de pozisyon düzeyinde oyuncuların performanslarını etkilediği sonucuna varılmıştır.

Anahtar Kelimeler: Futbol, Formasyon, Pozisyon, Teknik-taktik performans, Fiziksel performans

INTRODUCTION

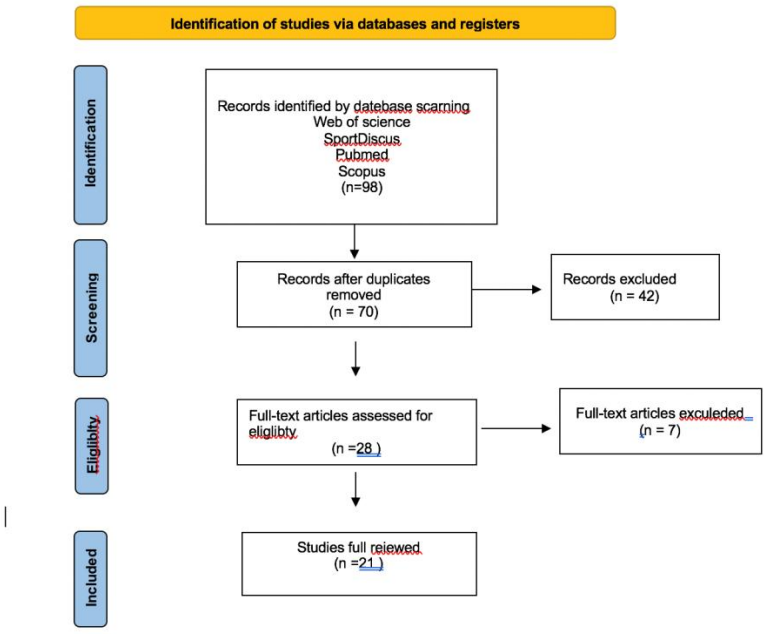
Team formations and players individual tactical roles (i.e., their positions and spatial distribution on the pitch) are among the most critical strategic decisions in football (Kannekens et al., 2011; Rein et al., 2016). Players in different formations and positions naturally face varying physical demands (Jones et al., 1999; Bangsbo et al., 2000). The nature of football requires high-intensity actions such as acceleration, deceleration, change of direction, sprinting, and jumping, alongside prolonged aerobic activities like standing, walking, and low-intensity running (Caldbeck et al., 2022). Recent studies indicate that performance variables in football matches have become increasingly intense over time. If this trend continues, match tempo is projected to increase by approximately 7% by 2030 (Nassis et al., 2020; Lago-Peñas et al., 2023). Understanding how running performance is influenced by different tactical systems and positions is crucial (Sarmento et al., 2018). However, there remains a knowledge gap, particularly at the elite level, regarding the impact of tactical formations on running performance (Tierney et al., 2016; Baptista et al., 2019). Forcher et al. (2018), in their analysis of the 2018/19 Bundesliga season, reported that center-backs and wing-backs in 3-4-3 and 3-5-2 formations recorded the highest total distances and high- intensity running values. Wide midfielders achieved the highest values in these metrics in the 4-4-2 diamond formation, while the lowest outputs were observed in the 3-4-3 formation. The same study noted that midfielders and forwards displayed relatively stable performance regardless of formation. Similarly, Bradley et al. (2011) found that defenders in the English Premier League playing in a 4-4-2 formation covered greater distances compared to those in 4-3-3 or 4-5-1 setups. Another study by Aquino et al. (2017) revealed that the 4-3-3 formation yielded higher values across all physical performance variables compared to the 4-4-2. Commonly used formations include 4-2-3-1, 4-1-4-1, 4-4-2, 4-3-3, and 3-5-2. However, studies directly comparing the technical and physical performance impacts of these formations are limited (Memmert et al., 2019). Forcher et al. (2022) indicated that team formations influence player performance at both team and positional levels, with players in three-defender systems (e.g., 3-5-2) exhibiting greater physical effort compared to those in four-defender systems. Additionally, players in the 4-4-2 formation demonstrated higher successful pass percentages compared to those in 4-3-3 and 4-5-1 formations. Football is a complex interplay of physical, technical, and tactical activities. Consequently, different technical and tactical strategies generate varying physical demands (Souza et al., 2020). Recent studies have considered ball possession duration as an indicator of playing style. Wang et al. (2022) suggested that while ball possession does not directly determine match outcomes, it significantly influences pass quality, directional effectiveness, and running performance. Differences in playing styles across leagues have also been observed, with English Premier League teams favoring a direct approach and La Liga teams employing pass- oriented attacking organizations. Asian-Clemente et al. (2022) compared the running performance of three Spanish teams based on their ball possession strategies, demonstrating that different tactical formations, in conjunction with player positions, significantly impact running performance. In light of these findings, this systematic review aims to analyze the technical-tactical and physical performance levels of players in different formations and positions, providing a comprehensive perspective on

trends and findings in the current literature.

METHODS

This study is a systematic review of recent literature examining the impact of different formations and positions on the technical-tactical and physical performance of football players. The review was conducted in accordance with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, with the search, selection, and inclusion process illustrated in Figure 1. The literature search was limited to publications between January 1, 2019, and January 1, 2025, and was conducted using the Web of Science, SportDiscus, PubMed, and Scopus databases. Search terms included combinations of "football," "soccer," "different formations," "different positions," "running performance," "physical performance," "technical-tactical," and "match analysis." The search was restricted to peer-reviewed journals published in English. Data from the identified studies were extracted in a standardized, non-pooled format. No restrictions were placed on league level, team or player numbers, player age or gender, or countries.

Figure 1. PRISMA flow diagram illustrating the identification, screening, and selection of relevant studies for the systematic review.



FINDINGS

This section presents the findings from the studies analyzed in this review. Data related to different formations and player positions in football are summarized in **Table 1.**

Table 1. Findings from studies on different formations and player positions in football

Researchers	League/Country	Formation(s)	Technology	Technical-Tactical Findings	Physical Performance Findings
Plakias & Michailidis (2024)	Turkey / Super League	-	InStat Optical	-	Fast attacks affect central defense; ball possession affects low intensity.
Zhang et al. (2024)	Chinese Super League	3-5-2, 4-2-3-1, 4-4-2, 3-4-3	Amisco Pro	Center-backs in 3-4-3 have higher ball possession and pass counts.	Wing-backs in 3-5-2 show more high-speed running; center-backs in 4-2-3-1 perform more sprints.
Modric et al. (2020)	Croatia	3-man vs 4- man	Catapult GPS	-	3-man defense produced more high-intensity running.
Aquino et al. (2020)	Brazil	4-4-2 vs 4-2-3-1	GPS	-	4-4-2 formation requires more running.
Memmert et al. (2019)	Germany (Amateur))	3-5-2 vs 4-2-3-1	Video	Team length and width are greater in 3-5-2.	-
Morgans et al. (2024)	English Premier League	-	Apex GPS	-	Formation and ball possession affect high-intensity running.
Modric et al. (2019)	Croatia	-	Catapult S5, InStat	-	Total distance and high-intensity runs vary by position.
Ribol et al. (2020)	Italy / Serie A	4-3-3 vs. 3-4-3	Stats Perform & K-Sport	-	Wingers showed highest speed, sprints, and accelerations.

Errekagorri et al. (2021)	Spain / LaLiga	-	TRACAB & Opta	Number of passes increased, while shots, crosses, and corners decreased.	-
Ivan-Baragano et al. (2024)	FIFA World Cup	-	InstatScout, WyScout	Set pieces and defensive height affect team success.	-
Ju et al. (2023)	English Premier League	-	Camera Analysis	-	Attacking midfielders performed the most high-intensity running with the ball.
Altmann et al. (2021)	Bundesliga	4-4-2, 4-2-3-1 vs 5-3-2	TRACAB	-	Fullbacks showed more running distance and sprints.
Modric et al. (2022)	UEFA Champions League	-	InStat Fitness	-	There is a relationship between high-intensity running with the ball and goal-scoring opportunities.
Vilamitjana (2021)	Argentina Second Division	1-4-2-1-3 vs. 1-3-4-3	Zephyr GPS	-	In the 1-4-2-1-3 formation, forwards and wingers demonstrated the highest high-intensity locomotion running (HILR) and sprinting (SPR) outputs
Teixeira (2021)	Portugal 2nd League	-	GPS	-	Central midfielders covered the most distance and showed the highest average speed

Forcher et al. (2022)	Bundesliga	3-4-3, 3-5-2, etc. 4-man defenses	TRACAB	Central defenders in 3-man defense made more passes.	Highest sprint distance observed in fullbacks playing with 3-man defense.
Aşcı et al. (2024)	Turkish Super League	-	Sentioscope	-	CM players covered the most distance, wingers performed the most sprints.
Yılmaz et al. (2023)	English Premier League	3-5-2 vs 4-3-3	Tracking	-	Ball possession and formation affect high-intensity running and distance.
Chen et al. (2025)	Asian Leagues	-	Performans GPS	-	High speed and endurance provide field control advantage in defensive positions.
Garcia et al. (2022)	-	-	SoccerCPD Method	Player role and formation changes were detected.	-
Rossi et al. (2022)	İtaly/ Serie A	Different Formations	GPS + League Analysis	-	Formation and team ranking affect running distance and speed.
Wang et al. (2021)	Chinese Super League	-	Opta	Ball possession and position affect technical performance. .	Different physical demands observed based on position.

This section integrates the technical-tactical and physical performance findings from 21 studies published between 2019 and 2025, with related researchers cited in parentheses. Technical- Tactical Performance Findings Different formations directly influence players' technical competencies. For instance, center- backs in the 3-4-3 formation exhibited higher ball possession and pass success rates compared to those in 3-5-2, while the 3-5-2 formation resulted in greater team length and width (Wei Zhang et al., 2024; Daniel Memmert et al., 2019). Over seasons, pass counts and team width increased, while variables such as shots, crosses, and the distance between the goalkeeper and defensive line decreased (Ibai Errekagorri et al., 2021). Effective use of set pieces, high defensive line positioning, and space restriction for opponents were identified as key determinants of team performance (Ivan-Baragano et al., 2024). In 4-3-3 and 4-2-3-1 formations, non-forward players made fewer passes and had less ball involvement (Forcher et al., 2022). Ball possession duration

and players' positional roles were found to influence technical actions (Wang et al., 2021). Additionally, models like SoccerCPD enabled the analysis of in-match formation changes and role adaptations (Garcia et al., 2022).

Physical Performance Findings

Formation, position, and ball possession significantly affect physical performance. Fast attacks increased high-intensity running among central defenders, while ball possession was associated with greater low-intensity running distances (Plakias & Michailidis, 2024). Center-backs' running performance varied by position and formation, with wing-backs in 3-5-2 performing more sprints compared to those in 4-4-2, and center-backs in 4-2-3-1 covering longer sprint distances (Morgans et al., 2024; Wei Zhang et al., 2024). Players in three-defender systems exhibited more high-intensity running, with fullbacks in these systems covering greater total distances (Modric et al., 2020). The 4-4-2 formation required more running compared to 4-2- 3-1 (Aquino et al., 2020). Midfielders and wingers recorded higher HSR and total distance values, with wingers also excelling in acceleration and deceleration counts (Modric et al., 2019; Ribol et al., 2020). Central forwards led in high-intensity running with the ball, while central midfielders excelled in transitional play distance production (Ju et al., 2023). Fullbacks in 4-4- 2 and 4-2-3-1 systems outperformed wing-backs in 5-3-2 in terms of sprint and total running distances (Altmann et al., 2021). A significant correlation was observed between high-intensity running with the ball and technical variables (Modric et al., 2022). In the 1-4-2-1-3 system, forwards and wingers recorded higher SPR, HSR, and HILR values, while CM and WM players covered greater total distances and metabolic loads, and wing-backs excelled in sprints (Vilamitjana, 2021; Teixeira, 2021). Players' speed capacities and endurance levels were linked to their spatial control abilities (Chen et al., 2025), with formation and team ranking influencing physical load variables (Rossi et al., 2022). Central midfielders covered significantly more total distance and high metabolic power (HMP) than other positions, while wing-backs led in sprints, high-speed running, and accelerations (Aşcı et al., 2024).

DISCUSSION AND CONCLUSION

In football, positional formations define the planned distribution of players on the pitch to execute defensive and offensive tasks effectively (Açak, 2019). Zhang et al. (2024) found that center-backs in the 3-4-3 formation exhibited higher ball possession, pass counts, and pass success rates compared to those in 3-5-2. These findings align with Wei Zhang et al. (2024), who reported positive differences in physical and technical outputs for center-backs in three- defender formations (3-4-3 and 3-5-2). Literature suggests that player performance is shaped not only by individual skills but also by the chosen formation. The technical and tactical nature of football results in multifaceted physical demands (Bradley et al., 2010). As the game evolves, so do its physiological requirements (Malone et al., 2015; Asian-Clemente et al., 2019).

Currently, elite footballers cover 9 to 14 km per match, with 5-15% of this distance

consisting of high-intensity running (Mallo et al., 2015; Modric et al., 2020). These demands vary by position, with midfielders typically covering the most total distance and wing-backs and wingers excelling in high-intensity running (Di Salvo, 2007; Modric, 2019). The studies analyzed in this review confirm that midfielders and wingers produce higher outputs in HSR and total distance compared to other positions (Modric et al., 2019; Ribol et al., 2020; Aşcı et al., 2024). Studies in the UEFA Champions League indicate that center-backs in the 3-5-2 formation exert greater physical effort (Modric et al., 2022), while Bundesliga data show that players in three-defender systems outperform those in four-defender systems in sprints and total distance (Forcher et al., 2022). These findings are corroborated by the studies reviewed here, particularly noting that wing-backs in 3-5-2 formations exhibit more high-speed running, sprints, and accelerations (Altmann et al., 2021; Wei Zhang et al., 2024). Polat and Gürkan (2020) concluded that high-intensity runs, both with and without the ball, are more crucial than the total distance covered in a soccer match.

Teams employing ball possession strategies consistently produce higher high-intensity running outputs, as supported by multiple studies (Souza et al., 2020; Modric et al., 2022). The reviewed studies also confirm that teams with high ball possession rates achieve better outputs in high-intensity running with the ball (Toni Modric et al., 2022; Ju et al., 2023). Technical and tactical performance differences across positions are well-documented (Dellal et al., 2010; Memmert et al., 2019). The findings evaluated in this review indicate that defenders have higher duel-winning rates, forwards experience more ball losses, and midfielders engage in more passing actions (Forcher et al., 2022; Zhang et al., 2024; Aşcı et al., 2024). In summary, this study highlights the complex and varied impacts of tactical behaviors across football formations, demonstrating that different formations significantly influence players' physical, technical, and tactical demands. The results of the 21 analyzed studies show that formation choices directly affect position- specific load distributions, passing and running performance, and in-match physical intensity. Future research should focus on systematic analyses of different age groups and women's football, meta-analyses comparing effect sizes, longitudinal studies on the in-match effects of formation changes, comparisons of technical-tactical differences across playing styles within the same league level, and standardization of data collection technologies (GPS, video analysis, optical tracking).

LİMİTATİONS

This systematic review is limited to peer-reviewed studies published in English. The variability in league levels, player profiles (age, gender), and countries may limit the generalizability of the findings. Additionally, the diversity in technologies and analysis methods used in the studies restricts the comparability of performance outputs. The absence of a meta-analysis prevents the reporting of effect sizes.

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