

RESEARCH ARTICLE

A systematic review about the performance indicators related to ball possession

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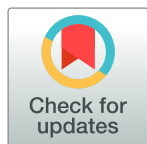
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Abstract

The purpose of this review was to investigate the influence of the performance indicators related to ball possession on the match outcome and team performance. Following the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-analyses) guidelines, this systematic review searched for literature on Web of Science, Scopus and Pub Med database, the publication date of the retrieved literature is set from January 2000 to December 2020. The keywords 'football' or 'soccer' were each paired with the following terms: 'ball possession', 'ball recovery', 'ball regain', 'transition', 'playing style', 'possession zone', 'duration' and 'running performance'. The search returned 2,436 articles. After screening the records against set criteria, 75 analysis were made, and their technical and physical indicators were identified. Through analysing ball-possession related variables, the review concluded that the match outcome is not related to ball possession percentage. The ball possession percentage is not dominant to predict the match success. The status of ball possession percentage can affect the team's performance in passing, organizational and running distance with the ball possession. There are league differences in ball possession strategies and duration. The frequency and offensive efficiency of direct ball recovery types are higher than indirect types. Ball possessions regained in the defensive third were higher than the final third. However, there remain some limitations such as the difference in the definition of concepts and sample participants, only a few studies consider the influence of situational variables and lack of in-depth analysis on ball possession strategy. Therefore, further study should adopt a more comprehensive approach, establishing a new connection between possession strategy and more technical and tactical indicators.



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Introduction

In order to better understand the constraints of promoting team success in football, performance analysis plays a very important role in team sports [1]. Match performance is the result of dynamic interactions of physical, technical and tactical actions and movements from all competing players [2]. Match success is achieved by the combination of coaches' teaching philosophy and the technical and tactical performance of players during the competition [3]. Although team success is complex and multifactorial, technical indicators have been found to

predict team success more accurately than physical indicators [4]. More specifically, ball possession, number of shots, shots on target, number of passes and pass completion rates are all associated with team success [5].

Ball possession was regarded as a popular performance indicator in a football match [6]. Several studies have revealed that ball possession has positive effects for a team to achieve match success [7–11]. Teams with more ball possessions mean that they can organize more attacks and create more opportunities for goal scoring. In addition, the teams that had long possession time can firmly grasp the initiative of the match, exert greater psychological and physiological load on opponents, and thus improve the chances of match success [12]. However, scoring goals is the ultimate variable that determines the match outcome, the number of goals was determined by the shooting quality rather than ball possessions [13]. Moreover, football is a sport with a low frequency of goal scoring, and it only accounted for 1% of ball possessions in elite matches [14]. Therefore, in order to make full use of the 1% of ball possessions, it is very important to analyze the characteristics of ball possession, especially in successful attacks.

In this context, in the past decade, many studies showed that the ball possession percentage of the successful teams was higher than the unsuccessful teams [4,15,16]. For example, during the 2010 World Cup tournament, the national team of Spain won the championship with the highest average possession percentage of 66.3%, while the German national team won the championship with the highest average possession rate of 56.7% in the 2014 World Cup [8]. However, in recent years, the role of possession percentage in the analysis of technical indicators has gradually weakened. Many studies have pointed out that possession rate does not reflect the real situation of the game, the number and percentage of ball possessions do not mean more opportunities for shooting and scoring [17]. In the 2018 World Cup, the France national team won the World Cup with less than 50% possession percentage per match. Therefore, the value and role of ball possession need in-depth study.

At present, increasing studies try to establish the relationship between the characteristics of ball possession and team performance [18,19]. Some studies through the relationship between ball possession and technical [5] (i.e., passing, shooting, aiming and scoring) and physical indicators [20,21] (i.e., total running distance, high-intensity running distance, running distance with and without balls) to explore its value and function. In addition, the ball possession strategy is reflected by the characteristics of the offensive organization per possession [22,23]. Previous studies divided the playing styles into direct attack, counterattack and elaborate attack [24–26]. The duration of ball possession represents the complexity of the team's attack, and it is also an important variable to evaluate the features of ball control [27–29]. However, the ball possession will not be obtained in vain, many studies attached great importance to the ball recovery patterns [30–32]. The research on the type and area of ball recovery will benefit the teams to regain the ball possession more efficiently when defense organization, and handle it more cautiously and reasonably when attacking, so as to improve the offense efficiency of the teams.

However, there are many studies about the indicators related to ball possession, and many contributions have been made, while there was not exist the systematic review on ball possession. Therefore, the aim of this paper is to systematic review the impact of performance indicators related to ball possession on football matches, investigate the relationship between ball possession related indicators and match outcome and team performance, clarify the role of ball possession in performance analysis, and summarize the achievements and limitations that researchers have made. Additionally, coaches could utilize these information to establish trends and objectives for teams and players in training and competition in order to enhance team performance.