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## Analysis of Some Field Activities that Constitute Success or Failure in Football

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### Abstract

Ten parameters were analysed in 1088 matches. Data were analysed in terms of total distance covered (km), run at 20-24 km/h (m), sprint distance (m), turnover (number), tackling the ball (number), ball possession (%), pass on target (%), time to retrieve the ball back (sec.) matches no goals allowed (number), matches with no goals scored (number). Data from the matches were obtained by using Sentio Sports Analytic software. The teams that completed the season in the first 5 places were considered as successful, and the teams that completed the season in the last 3 places were considered as unsuccessful. The normality of the data was analysed with the Shapiro-Wilk test and homogeneity of variance was tested with the Levene test. While there is no significant difference in terms of total distance covered, run at 20-24 km/h, sprint distance, turnover and tackling the ball between successful and unsuccessful teams in matches played, a significant difference was found in ball possession, pass on target, time to retrieve the ball back matches no goals allowed, matches with no goals scored.

### Introduction:

The definition of tactical game model in football has led many researchers to do up-to-date research. The practice of specific tactical options in the game depends on a series of factors; notably technical training of the players, physical competence and psychological maturity (Jankovic *et al.*, 2011). Researchers in this field try to determine the strengths and weaknesses of the teams by evaluating some parameters during the matches (James, 2009). Primary goal of this type of analysis is that the coach prepares the team for the match and develops tactics upon the weaknesses of the opponent (Carling *et al.*, 2009).

Today, with the rapid advances in technology, video analysis systems applied to sports performance have become an essential tool for trainers and coaches to gather information about individual and team activities during trainings and matches (Den Hollander *et al.*, 2018). Match analysis which is a valid tool providing physiological, technical and tactical information about game performance (Memmert & Rein, 2018) is a crucial process widely used by coaches in most sports to provide feedback on performance (Carling *et al.*, 2005).

In recent years, there has been a significant increase in the information of the athletes' running distances through

match analysis (Brandley *et al.*, 2018). This is related to the rapid development in match analysis systems and the growing interest of the coaches in the issue (Rivilla-Garcia *et al.*, 2019). The literature shows that there are different physical needs between teams depending on various factors (Rampinini *et al.*, 2007).

The technical/physical indicators that affect the outcome of the football match are not clear and there are a limited number of studies which examine the effects of these indicators on match results (Zhou *et al.*, 2018). While there are studies on parameters affecting a team's league position, there is limited literature on the physical variables that distinguish successful and unsuccessful teams (Clemente *et al.*, 2019).

Regarding successful, unsuccessful, home or away teams, the researchers focused on different parameters such as goal/goal position (Szwarc, 2008; Imamoglu *et al.*, 2007; Acar *et al.*, 2009; Luhtanen *et al.*, 2001), number of passes (Hughes & Franks, 2005; Hughes & Churchill, 2005; Szwarc, 2004; Scoulding *et al.*, 2004), corner kicks (Zileli & Söyler, 2020; Zileli *et al.*, 2017), technical behavior (Taylor *et al.*, 2008) and training load (Lago *et al.*, 2010; Lago-Penas & Lago-Ballesteros, 2011; Castellano *et al.*, 2011), physical and technical activities (Moalla *et al.*, 2017). It is possible to

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increase the number of these parameters.

The research on the tactical approaches of football teams with different performance levels are mainly conducted among teams at international levels. This created a need for similar studies to be conducted in the Turkish National League. Specifically, it is necessary to determine whether there are differences in specific tactical approaches between top and bottom teams in the season, and more specifically to understand the degree of the difference if found. What makes this study more important is that it analyzes matches played for four seasons, which is a long period. In other words, there are not any publications presenting such analyses obtained by examining the tactical success of Turkcell Super League teams over a long period of time in consecutive seasons.

From this point of view, this study aims to analyse whether there are differences between successful teams (which complete the season among the top five) and unsuccessful teams (which complete the season among the lowest three) in matches played in the last four years (2015/2016; 2016/2017; 2017/2018; 2018/2019) in Turkcell Super League in terms of total distance covered (km), run at 20-24 km/h (m), sprint distance (m), turnover (number), tackling the ball (number), ball possession (%), pass on target (%), time to retrieve the ball back (sec.) the number of matches no goals allowed (number), the number of matches with no goals scored (number).

### Materials and Methods:

In this study, general survey model was used and a total of 1088 matches in the last four years (2015-2019) of Turkcell Super League were taken under review. The matches were played by the teams which completed each season among the top five places and the teams which completed the season among the lowest three.

In compliance with the status of Super League Competitions, the teams which complete the season among the top five places were considered as "successful" as they represent Turkey) in the European Cups (article 12), and the teams which complete the season among the lowest three were considered as "unsuccessful" as they are dropped from the league into a lower league (article 3) <https://www.tff.org/default.aspx?pageID=133> (09.01.2021) Data were analysed in terms of total distance covered (km), run at 20-24 km/h (m), sprint distance (m), turnover (number), tackling the ball (number), ball possession (%), pass on target (%), time to retrieve the ball back (sec.) matches no goals allowed (number), matches with no goals scored (number).

In this study, the matches of successful teams (which complete the season among the top five) and unsuccessful teams (which complete the season among the lowest three) played in the last four years (2015/2016; 2016/2017; 2017/2018; 2018/2019) of Turkcell Super League were assessed. Data from 1088 matches were obtained by one

researcher using Sentio Sports Analytic (Iserre, Fransa) software. The study was approved by Bilecik Şeyh Edebali University, University Ethics Committee (2021-11035).

According to the data obtained, the teams that completed the season in the first 5 places were considered as successful, and the teams that completed the season in the last 3 places were considered as unsuccessful. The normal distribution evaluations of the data were carried out with the Shapiro-Wilk test and the variance homogeneity was tested with the Levene test. Independent Sample T Test was used for data showing normal distribution, and Mann Whitney U test was used for data which did not show normal distribution. The p value for statistical significance was set at <0.05.

**Results:** Data obtained from the analyses of the matches of successful and unsuccessful teams in the last four years of the Turkcell Super League is given in Table-1.

Table 1. Parameters of successful (Succ.) and unsuccessful (UnSucc.) Teams

| Variables                             |         | n  | $\bar{x}$ | sd   | t/z    | p     |
|---------------------------------------|---------|----|-----------|------|--------|-------|
| Total Distance Covered (km)           | Succ.   | 20 | 109.31    | 2.13 | -1.25z | 0.22  |
|                                       | UnSucc. | 12 | 110.20    | 1.56 |        |       |
| Run at 20-24 km/h (m)                 | Succ.   | 20 | 4.62      | 0.23 | -0.62t | 0.53  |
|                                       | UnSucc. | 12 | 4.58      | 0.23 |        |       |
| Sprint Distance (m)                   | Succ.   | 20 | 2.57      | 0.16 | 0.12z  | 0.90  |
|                                       | UnSucc. | 12 | 2.56      | 0.21 |        |       |
| Turnover (number)                     | Succ.   | 20 | 98.60     | 5.38 | -0.79z | 0.43  |
|                                       | UnSucc. | 12 | 100.08    | 4.66 |        |       |
| Tackling the Ball (number)            | Succ.   | 20 | 102.85    | 7.58 | -1.30z | 0.20  |
|                                       | UnSucc. | 12 | 106.00    | 4.55 |        |       |
| Ball Possession (%)                   | Succ.   | 20 | 53.15     | 3.60 | 3.52z  | 0.00* |
|                                       | UnSucc. | 12 | 49.00     | 2.45 |        |       |
| Pass on Target (%)                    | Succ.   | 20 | 83.05     | 2.33 | -3.35t | 0.00* |
|                                       | UnSucc. | 12 | 78.50     | 7.17 |        |       |
| Time to Retrieve the Ball Back (sec.) | Succ.   | 20 | 9.86      | 1.36 | -2.48t | 0.01* |
|                                       | UnSucc. | 12 | 11.12     | 1.67 |        |       |
| Matches No Goals Allowed (number)     | Succ.   | 20 | 11.80     | 3.12 | 4.67z  | 0.00* |
|                                       | UnSucc. | 12 | 6.75      | 2.67 |        |       |
| Matches with No Goals Scored (num.)   | Succ.   | 20 | 5.10      | 2.05 | -6.98z | 0.00* |
|                                       | UnSucc. | 12 | 11.92     | 3.50 |        |       |

There was no statistically significant difference in terms of parameters: total distance covered (km), run at 20-24 km/h (m), sprint distance (m), turnover (number) and tackling the ball (number) ( $p > 0.05$ ) between successful and unsuccessful teams. On the other hand, there was a statistically significant difference ( $p < 0.05$ ) in ball possession (%), pass on target (%), time to retrieve the ball back (sec.) matches no goals allowed (number), matches with no goals scored (number) between successful and unsuccessful teams.

### Discussion:

The aim of this research was to analyse whether there were differences between successful and unsuccessful teams in matches played in the last four years in Turkcell Super League in terms of total distance covered (km), run at 20-24

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km/h (m), sprint distance (m), turnover (number), tackling the ball (number), ball possession (%), pass on target (%), time to retrieve the ball back (sec.) the number of matches no goals allowed (number), the number of matches with no goals scored (number).

From data obtained during the research (Table-1), it can be inferred that successful teams possess the ball more than unsuccessful teams, their passes were more on target, they retrieve back the ball in a short span of time even if they tackle the ball, and that they both attack and defense effectively. To be brief, it has once more been brought out that today's football in Turkey is a team game rather than an individual game.

Possession of the ball is one of the most studied topics (Lago & Martin, 2007). Studies examining the difference between winning teams and losing teams show that the determinant factors on the success of the match were the frequency of kick for goals and possession of the ball (Castellano *et al.*, 2012; Grant *et al.*, 1999). Looking at the studies on ball possession in World Cups, Hughes *et al.*, (1988) reported that teams that advanced to the FIFA World Cup semi-finals in 1986 were more likely to make successful kicks on the goal after retrieving the ball back. Likewise, Hughes & Franks (2005), in the study which compared the performance of tactical activities between successful and unsuccessful teams in the 1990 World Cup, reported that successful teams achieved better results in terms of the parameter "possession of the ball". Low *et al.*, (2002) also found similar results in the study in which they analysed 40 matches in the 2002 World Cup. In the World Cup in 2006, possession was found to be a distinctive parameter for winning teams compared to losing teams or drawn matches (Balyan *et al.*, 2007). Analyses of the 2020 World Cup matches show that the most important variable in the success of successful teams is the ball possession (Kempe *et al.*, 2014). In the 2014 World Cup, the ball possession rate of successful teams varied between 50.32% and 56.71%. Basic elements that bring success can be said to be possession of the ball mostly in the midfield and attacking zones, attempts for pass, successful pass numbers and very high pass success percentages (Göral, 2015). According to the results of the match analyses carried out for the 2015-2016 UEFA Champions League, the key to success was to possess the ball (Clemente & Martins, 2017).

When the research about ball possession parameter in national leagues were reviewed, analyses of the matches in the German Bundesliga 2009/10 and 2010/11 seasons show that the most important variable in the achievement of succeeding teams is the ball possession parameter (Kempe *et al.*, 2014). In the 2011 and 2012 seasons, the number of goals for successful teams in the German Bundesliga was directly related to ball possession rather than the game (Hoppe *et al.*, 2015; Yue *et al.*, 2014). Zou *et al.*, analysed Chinese Football Association Super League (2018). In the

study, they found out that when compared with the losing teams, winning teams had more running distance and higher speed running distance when they possess the ball. However, when winning teams didn't possess the ball they have less running distance and high speed running distance (Zhou *et al.*, 2018). Top ranked teams in the Greek Super League were found out to have a higher percentage of ball possession than the teams in the lower ranks. The main reason of this was the location of the match, namely, being the home team (Gomez *et al.*, 2018). According to the findings of the present study (Table-1), successful teams were observed to have a higher average rate of playing with the ball than unsuccessful teams (respectively 53.15; 49.00). The data obtained in this study are similar to the results of studies obtained in the World Cup, UEFA Champions League and local leagues. When the data of this study and the studies in the literature considered, it is obvious that one important key of being successful in every category in football is the possession of the ball.

Number of passes during attack can give information about the structure of the attack. Jankovic *et al.*, (2011) reveal that most of the weaker teams attack by playing individually with a small number of passes, while the strong teams attack with more passes and players. According to the analyses of the previous three World Cups, it was clear that there was an increase in the percentage of attacks with 5 or more passes. This shows that there were more attacks and there was the necessity to possess the ball when compared with the opponent (Jankovic *et al.*, 2010). Successful teams in 2010 FIFA World Cup were better than unsuccessful teams for all variables with regards to offensive and defensive outcomes for attack and defense, particularly in terms of attacks, shoots and passes (Bordonau *et al.*, 2013; Clemente, 2012). Buraczewski & Bergier, (2007) reported that attacks with two (16.7 %), three (25 %) or four (22.9 %) players were more effective. Jankovic *et al.*, (2011) carried out a study in which they analyzed the matches in the Serbian Football Super League in the 2009-2010 season in terms of the factors affecting the ranking. The results of the study reveal that success in pass made a statistically significant difference in favour of the first four teams.

According to Castellano *et al.*, (2011), high intensity activities are associated with team success and ranking of the league. When we review studies supporting this information, we see that run between 14-19 km/h and total distance are two distinctive factors for successful teams in Italian Serie A (Rampinini *et al.*, 2009). Likewise, run between 19.8-25.2 km/h is a distinctive factor for successful teams in English Premier League (Di Salvo *et al.*, 2009). Winning teams in Brazilian Professional Football League had more total run distance compared to the weaker teams (Aquino *et al.*, 2020). Running speed at 23km/h and above in the Chinese Football Association Super League is found to be a vital variable in victory, draw and loss (Zhou *et al.*,

2018). However, there were studies opposing the studies above-referred studies. For instance, Clemente *et al.*, (2019) analyzed 9641 matches of the teams from Spanish League (Spanish La Liga) in 2013-2014 season. The matches consisted of the teams that joined the Champions League, ranked high/low in the league or dropped from the league, and the parameters were total distance and distance covered at different running speeds like 14, 21, 24 km/h and above. As a result, they found that total running distance was not correlated with success. Another finding of the study is that successful/unsuccessful teams had similar running requirements at high speed (21-24 km/h). Moalla *et al.*, (2017) examined the relationship between the match situation (winning, drawing, or losing) of a professional team and its technical/physical parameters during two seasons. As a result of the study, they found a relationship between winning a match with total distance and run with low intensity. Another finding of the study was the relationship between losing a match with sprinting (<25.2 km/h) and run with high intensity (<19.8 km/h). Furthermore, another study revealed that the total distance covered and the intensity of running vary according to different playing positions (Modric *et al.*, 2019). The findings of our study shows that there were no distinctive factors between successful and unsuccessful teams in terms of total distance covered (km), run at 20-24 km/h (m) and sprint distance (m).

The importance of the shot in finding goals in football is beyond argument. In one of the studies on World Cups, Castellano *et al.*, (2012) stated that -in matches played in three World Cups (2002, 2006, 2010)- total shots, shots on target and ball possession parameters are distinctive factors. Szwarc (2004) also found a similar result by revealing that teams which made it to the final in the 2002 World Cup shot more than teams that did not make it to the final (respectively 18.0 - 14.08). When national leagues are reviewed, study of Armatas *et al.*, (2009) is worthy of noting. Researchers compared the top two and the lowest two teams in the Greek league. They found out that the teams finishing the season in the top two places shot more for scoring goals compared to the last two teams. Similarly, Lago *et al.*, (2010) found that the top teams in the Spanish professional football league scored in an average of 14.4 shots, while the teams in the lower ranks scored in an average of 12.0 shots. In matches played in the Chinese Football Association Super League between 2012 and 2017, shots, shots on target, 50-50 challenge won, offsides, sprinting distance, sprinting effort, sprinting distance in ball possession and high-speed-running distance in ball possession parameters were proven to be influential factors (Zhou *et al.*, 2018). Current studies show that the players of successful teams have higher values in terms of covering longer distances with the ball, very high intensity running, high average of shot, ball possession, pass, interception and dribbling compared to the players of

unsuccessful teams (Sarmiento *et al.*, 2014). Brito de Souza *et al.*, (2019) analyzed the matches of the top three and the lowest three teams in the Spanish La Liga for 8 seasons. The result of the study reveals that the factors that create distinction in favour of the top three teams were the shooting during attack and the corner kicks during defence (Brito de Souza *et al.*, 2019). In the present study, we did not directly consider whether shot is a distinctive factor or not. However, with a different point of view, we analysed the parameters which can give information about the result of the shot. It was found that successful teams defend themselves better in terms of the number of matches no goals allowed (respectively: 11.80; 6.75), and attack better in terms of the number of matches with no goals scored (respectively: 5.10; 11.92). Besides, successful teams have shown that they were more ambitious by making a difference with the time to retrieve the ball back (respectively: 9.86; 11.12) (sec.). In this context, it was previously shown that the English Premier League and Spanish Premier League teams differ in terms of various physical aspects in matches which suggests there might be cultural differences among professional football leagues and game positions (Dellal *et al.*, 2011). These differences are undoubtedly due to the difference between the various types of competition analysed (Moalla *et al.*, 2017)

When the general results of the present study considered, we saw that successful and unsuccessful teams had different physical performances. The notion that successful teams will always have better parameters should not be seen as fixed. The literature reviewed above aims to present the distinctive factors between successful and unsuccessful teams in the World Cup, International Leagues or National Leagues. We also aimed to contribute the literature with the parameters we have examined. The findings of the present study show that technical and tactical skills can be highly important in football. It is obvious that more studies on match analysis in football are necessary.

Eventually, this study analyzed the matches of successful and unsuccessful teams in the Turkcell Super League [Turkcell Super League in Turkey ya da Turkish Turkcell Super League denebilir mi?] with the aim to identify the performance indicators that best distinguish successful and unsuccessful teams. Results show that parameters such as ball possession (%), pass on target (%), time to retrieve the ball back (sec.) matches no goals allowed (number), matches with no goals scored (number) were found to be distinctive factors between successful and unsuccessful teams. Trainers and footballers should have awareness of these different profiles for the success of their teams. The results of this research can be helpful for trainers to design their training programs. In particular, we recommend that possession drills should be integrated more in the training programs.

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