Relationship between time and goal scoring of European soccer teams with different league ranking

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ABSTRACT

The aim of the current study was to compare scored and conceded goals as well as the time period among teams of different league ranking. Researchers recorded the total games (n= 1446) of the top European leagues of Spain, Italy, Germany, and France for the period 2015-2016. The teams were divided into the ones which achieved their participation for European cups (L1), teams that remained to the category (L2), and teams which relegated to the lower category (L3). The researchers recorded the scored goals, the conceded goals, and the goal differences, per game, per half, and per 15min in total games for 2015-2016 season. The results showed that L1 teams were superior to L2 and L3 in overall goal scoring characteristics in both halves. The superior 15min periods were also explored. In addition, L2 teams performed higher than L3 teams in most of the variables. In conclusion, the difference between L1 with L2 and L3 teams is based in goal scoring during the whole game, in contrast with the difference between L2 and L3 teams that relies on stronger defense. On the other hand, L3 teams did not perform higher in any goal scoring pattern than the other two groups. It is obvious, that performance difference is achieved by the first half which is difficult to change during the second half. Thus, coaches have to emphasize achieving high performance in the first half of the game. Furthermore, they must use their substitutions so as to avoid poor performance periods and

heighten the offensive and defensive play of their teams. **Key words:** PERFORMANCE INDICATORS, GOALS SCORING EVALUATION, MATCH ANALYSIS, EUROPEAN CHAMPIONSHIPS.

INTRODUCTION

Soccer is watched and passionately followed by millions of people worldwide. It is one of the most popular games all over the world with huge economic, social, political and cultural importance in human and sport history. European Champions and Europa Leagues are very popular because the top ranking teams participate in these. According to the results of the teams which participate in European cups each national league gathers points which determine their final ranking. Then UEFA allocates the number of European places among associations for the forthcoming UEFA club competitions. The interaction among technical, tactical, physiological and psychological factors affect team performance as well as the result of the game (Bekris, Gioldasis, Gissis, Komsis, & Alipasali, 2014). Nowadays match analysis is very popular among sport scientists to study the tactical issues of the game. Specifically, it is defined as the objective recording and assessment of behavioral actions that occur during games (Carling, Williams, & Reilly, 2005). Coaching staffs of top level teams apply high qualitative and quantitative analyses for all the game patterns so as to explore the strengths and weaknesses of their own teams as well as opponent's ones (Carling, Reilly, & Williams, 2008; Martinez & Lago, 2007; Zubillaga, Gorospe, Mendo, & Villaseñor, 2007). Furthermore, match analysis of top level teams is very useful for weak and less experienced teams to find out new technical and tactical approaches. Several studies have already analyzed the differences among high and low performance teams. The final results, victories, qualifications, promotions, as well as the league rankings have been examined and correlated with a variety of performance indicators (Bekris et al., 2014; Bekris et al., 2013; Bloomfield, Polman, & O'Donoghue, 2005; Castellano, Casamichana, & Lago, 2012; Lago, Lago, & Rey, 2011).

Goals
Goal scoring which is the climax and the target of any offense, is one of the most important tactical patterns, that is very frequently examined (Michailidis, Michailidis, Papaiakovou, & Papaiakovou, 2004). It also constitutes the key of success for the teams (Cachay & Thiel, 2000). Goal scoring difference reveals the offensive and defensive efficacy of a team and determines its overall performance. Scoring more goals than the opponent is the ultimate determinant of success (Wright, Atkins, Polman, Jones, & Sargeson, 2011). Many studies have already examined the characteristics of goals scored in several tournaments (Bekris et al., 2013; Garganta, Maia, & Basto, 1997; Jinshan, Xiakone, Yamanaka, & Matsumoto, 1993; Michailidis et al., 2004; Olsen, 1988; Yiannakos & Armatas, 2006). Moreover, the total number of achieved goals is related to the victories and the final ranking of national and worldwide cups (Bekris et al., 2013; Delgado-Bordonau, Monforte, Guzmán, & Villanueva, 2013; Kapidžić, Mejremić, Bilalić, & Bečirović, 2010).

Time and goal scoring
The relationship between game time and goal scoring patterns has already been examined in several tournaments. Many studies support the view that the frequency of scored goals during a game is time dependent (per half or per 15min) (Abt, Dickson, & Mummery, 2002; Bekris, Louvaris, Souglis, Hountis, & Siokou, 2005; Sotiropoulos, Mitrotasios & Travlos, 2005) while others conclude that there is no immediate correlation between them (Jinshan et al., 1993; Michailidis et al., 2004). Armatas, Yiannakos, and Sileloglou (2007b) concluded that in 1998 and 2002 World Cups most goals were scored in the second half. Although the difference was not statistically significant in 2006 World Cup and in 2012 European Championship national teams achieved 52,5% and 57,9% of their goals in the second half (Armatas et al., 2007b; Michailidis, Michailidis, Primpa, 2013). İmamoğlu, Çebi, & Eliöz (2011) found that in 2010 World Cup the number of goals scored in the second half was 59,31% while in the first half was 40%. Similarly, in female 1999 and 2003 FIFA World Cups most goals were scored in the second half while in FIFA 1995 World Cup teams scored more goals in the second half (53,55%) but without any significance (Armatas, Yiannakos, Galazoulas, & Hatzimanouil, 2007a). Likewise, other studies found that in 2004 (Yiannakos & Armatas, 2006) as well as in

2016 European Championship (Çebi, Eliöz, İmamoğlu, & Yamak, 2016) most goals were achieved in the second half (57,4% and 64,8% respectively). Regarding national leagues, Armatas, Yiannakos, Papadopoulou, and Skoufas (2009) found that in Greek Super League (2006-07) 58,96% of goals achieved in the second half. Concerning scored goals of each 15min period, Armatas et al. (2009) found a tendency of goal increase during the 15min periods with a climax in the last period (75-90min) that includes 23,3% of total goals. Armatas et al. (2007b) also concluded that in 1998 World Cup as well as in 2006 World Cup (32,8%, p<0.05) most goals were scored in the last period (76-90min). Also in World Cups 1998 and 2002 there was presented a trend towards more goals scored as time progressed. Similarly, in 2010 World Cup the 24,14% of total goals were achieved during the 75-90min period. This percentage was the highest, but the researchers did not present its significance level (Njororai, 2013). In 2012 European Championship, 15min analysis of goals showed a similar percentage of scoring in all 15min periods apart from "extra time", "half", and "0-15min", when scored goals were less (Michailidis et al., 2013). However, Michailidis et al. (2013) did not present the significance level of that difference. Recently, it was found that in 2016 European Football Championship, the highest number of goals were scored between 61-75min with a rate of 29,60%. The lowest number of goals were scored between 1-15min with a rate of 6,5% (Çebi et al., 2016).

However, in our knowledge there are no studies that examine the relationship of goals scored, goals conceded and goal difference changes, during the whole game, each half and each 15min period, with the final ranking of the clubs. Therefore, the aim of the current study was to find the time periods of the game that significantly affect offensive and defensive performance of the clubs and determine their final league ranking.

MATERIALS AND METHODOLOGY

Participants
To examine the relationship between goal scoring patterns and final ranking of the clubs, 1446 games of the 2015-16 top ranking European Leagues were assessed. Specifically, 380 games from LaLiga (Spain), 380 from Serie A (Italy), 306 from Bundesliga (Germany) and 380 games from Ligue 1 (France) were examined. In 2014-15 season UEFA league assessment ranked LaLiga in the first place, Serie A second, Bundesliga third and Ligue 1 fifth. Data collection carried out by official links of national federations and the researchers recorded goals scored, goals conceded, goal difference during the whole game, per half, and per 15min period in all the games of 2015-16 season.

Design and Procedures
*T*he researchers divided the 78 teams of these leagues in three groups, teams which promoted for the European Cups (level 1- L1; n= 21), teams that remained to the current league ((level 2- L2; n= 45) and teams that relegated for lower category (level 3- L3, n= 12).

Data Analysis
All statistical analyses were performed using the SPSS package (v. 23). Descriptive statistics for the variables were computed using the SPSS frequencies procedure. Then, analysis of variance (ANOVA) was used to indicate group differences among the groups concerning the testing variables. Finally, post hoc Bonferronni comparisons were used to examine the differences among the sub-groups.

RESULTS

Preliminary statistical analyses for checking the assumptions of symmetry and normality showed that skewness and kurtosis values were close to zero and inside the acceptable range of ±2 (George & Mallery, 2010). In addition Kolmogorov-Smirnov test of normality showed that data are normally distributed (p> ,05). Then Levene's tests for equality of variance showed that there was not any significant value (p> .05) so we confirm the assumption of homogeneity.

The goal scoring patterns for the three leveled groups of teams were compared by using analysis of variance while Bonferroni comparisons were used to assess the significance of their differences. The following table (Table 1) which includes the goal scoring patterns makes it clear that L1 group perform higher in all the variables compared to L2 and L3 groups. On the other hand, L2 group presents significantly higher performance only in 75-90min goal scored than the L3 group.

Table 1. Goal scored descriptive results and differences among L1, L2 and L3 teams.

Goal scoring	Level 1; L^1	Level 2; L^2	Level 3; L^3		
	M (*SD*)	M (*SD*)	M (*SD*)	F	Bonferroni
	n= 21	*n*= 45	*n*= 12		
Total goals scored/per game	1.83 (.52)	1.17 (.19)	.95 (.11)	42.268***	1>2; 1>3
1st half goals scored/per game	.81 (.26)	.52 (.14)	.42 (.14)	25.260***	1>2; 1>3
2nd half goals scored/per game	1.02 (.33)	.65 (.15)	.53 (.09)	29.292***	1>2; 1>3
0-15min goals scored/per game	.21 (.11)	.14 (.08)	.13 (.08)	5.269**	1>2; 1>3
15-30min goals scored/per game	.28 (.11)	.18 (.07)	.15 (.07)	14.916***	1>2; 1>3
30-45min goals scored/per game	.31 (.10)	.19 (.09)	.13 (.08)	21.000***	1>2; 1>3
45-60min goals scored/per game	.31 (.13)	.18 (.08)	.14 (.07)	14.530***	1>2; 1>3
60-75min goals scored/per game	.30 (.16)	.19 (.10)	.19 (.07)	6.910**	1>2; 1>3
75-90min goals scored/per game	.41 (.13)	.27 (.10)	.19 (.05)	20.736***	1>2; 1>3; 2>3

*p< .05; **p< 0.01; ***p< 0.001

As far as the goal conceded it is obvious that L1 group concede less goals than L2 and L3 groups but not in all the time periods (Table 2). Specifically, L1 teams concede less total goals, first half, second half, 0-15min, 15-30min, 60-75min, and 75-90min goals than L3 teams. Furthermore, L1 teams concede less goals than L2 teams in total, first half, second half, 0-15min, and 60-75min. On the other hand L2 teams concede less goals than L3 teams only in total and in the first half.

Table 2. Goal conceded descriptive results and differences among L1, L2 and L3 teams.

Goal conceded	Level 1; L[1]	Level 2; L[2]	Level 3; L[3]		
	M (*SD*)	M (*SD*)	M (*SD*)	F	Bonferroni
	n= 21	*n*= 45	*n*= 12		
Total goals conceded/per game	.95 (.30)	1.35 (.30)	1.73 (.23)	28.600***	1<2; 1<3; 2<3
1st half goals conceded/per game	.42 (.14)	.60 (.18)	.81 (.17)	21.279***	1<2; 1<3; 2<3
2nd half goals conceded/per game	.53 (.19)	.77 (.19)	.91 (.22)	17.332***	1<2; 1<3
0-15min goals conceded/per game	.11 (.06)	.17 (.10)	.20 (.09)	6.106**	1<2; 1<3
15-30min goals conceded/per game	.14 (.06)	.19 (.09)	.32 (.12)	14.862***	1<3
30-45min goals conceded/per game	.15 (.10)	.29 (.43)	.26 (.09)	1.324	
45-60min goals conceded/per game	.16 (.08)	.22 (.11)	.25 (.10)	3.410*	
60-75min goals conceded/per game	.16 (.09)	.23 (.09)	.26 (.08)	5.930**	1<2; 1<3
75-90min goals conceded/per game	.22 (.09)	.30 (.13)	.37 (.15)	5.902**	1<3

*$p < .05$; **$p < 0.01$; ***$p < 0.001$

Concerning goal difference variable (table 3) both L1 and L2 groups differed significantly in most of the patterns from L3 group. Specifically, L1 teams performed higher goal difference than both L2 and L3 teams in total goals, first half, second half, 30-45min, 45-60min, and 60-75min period. In addition, L2 teams revealed higher goal difference than L3 teams in total goals, first half, second half, and 30-45min period.

Table 3. Goal difference descriptive results and differences among L1, L2 and L3 teams.

Goal difference	Level 1; L[1]	Level 2; L[2]	Level 3; L[3]		
	M (*SD*)	M (*SD*)	M (*SD*)	F	Bonferroni
	N= 21	N= 45	N= 12		
Total goal difference/per game	.87 (.68)	-.19 (.29)	-.77 (.31)	65.732***	1>2; 1>3; 2>3
1st half goal difference/per game	.39 (.30)	-.08 (.21)	-.39 (.25)	44.991***	1>2; 1>3; 2>3
2nd half goal difference/per game	.48 (.45)	-.12 (.24)	-.38 (.23)	38.167***	1>2; 1>3; 2>3
0-15min goal difference/per game	-.18 (1.34)	-.04 (.15)	-.07 (.12)	.300	
15-30min goal difference/per game	.42 (1.29)	-.02 (.10)	-.16 (.13)	3.899*	1>2
30-45min goal difference/per game	.15 (.15)	-.03 (.11)	-.15 (.13)	27.042***	1>2; 1>3; 2>3
45-60min goal difference/per game	.16 (.14)	-.04 (.97)	-.13 (.13)	29.389***	1>2; 1>3
60-75min goal difference/per game	.13 (.23)	-.05 (.14)	-.07 (.14)	8.402***	1>2; 1>3
75-90min goal difference/per game	.19 (.19)	-.79 (5.07)	-.18 (.16)	.485	

*$p < .05$; **$p < 0.01$; ***$p < 0.001$

DISCUSSION AND CONCLUSIONS

Total goals

Regarding total goals scored per game, it seems that L1 teams achieve a mean of 1.83± 0,52 goals, value that is significantly higher from L2 who score 1,16± 0,19 goals per game and L3 who score 0.94± 0,11 goals per game ($p<$,001). In contrast, L2 and L3 do not differ significantly. Therefore, it is obvious that teams who score around 2 goals per game belong to the top level group while teams who score around 1 goal per game do not have high expectations. The current findings support past study of Bekris et al. (2013) who suggested that goal scoring is related to the final league ranking of 2011-12 Greek Super League. Specifically, they suggested that champion team scored 2,44± 1,62 goals per game rate that was significantly higher than teams who took the other European qualification places (2nd - 5th) and scored 1,60± 1,05 goals per game, teams that remained to the Super League who scored 1,24± 1,04 and teams that relegated for Football League and scored 1,1± 0,98. Similarly, Kapidžić et al. (2010) found that winning teams scored more goals in the Premier League of Bosnia and Herzegovina in 2008-09 season. Furthermore, Delgado-Bordonau et al. (2013) found that in 2010 World Cup national teams which reached to the semi-finals scored significantly more goals (1,7± 1,2 per game) than the rest of the national teams (0,7± 0,8 per game).

Goals scored per half

The results also showed that L1 teams score significantly more goals (0,81± 0,25) than L2 (0,51± 0,14) and L3 teams (0,41± 0,14) during the first half ($p<$,001). On the other hand L2 and L3 teams do not present any significant difference. Similarly, L1 teams score significantly more goals (1,01± 0,32) than L2 (0,64± 0,15) and L3 (0,53± 0,87) teams during the second half ($p<$,001). It is obvious that goals scored is a discriminant index that distinguishes L1 teams from L2 and L3 teams from the first half and it is difficult to change during the second half. Furthermore, all the teams score more goals in the second half, finding that confirms previous studies (Armatas et al., 2009; İmamoğlu et al., 2011; Yiannakos & Armatas, 2006). However, the researchers did not present the characteristics (level, results etc) of these teams. In contrast, Armatas et al. (2007a) as well as Michailidis et al. (2013) did not conclude any significant difference concerning goal scoring per half. Finally, Armatas et al. (2007b) found that national teams achieved more goals in the second half in 1998 and 2002 World Cup, finding that was not significant in 2006 World Cup. Although some studies have found that physical condition indexes such as aerobic capacity and anaerobic threshold determine the league ranking of the teams (Apor, 1988; Kalapotharakos et al., 2006; Wisløff, Helgerud, & Hoff, 1998), current study indicates that L1 teams are superior in goal scoring to L2 and L3 from the first half. A possible cause is that they perform better individual and team offensive tactical behavior that creates immediate and rapid differences in the game. Thus, it is obvious that physical condition is not the only indicator that affects performance and league ranking of the teams (Aziz, Newton, Kinugasa, & Chuan, 2007). Although, the higher percentage of goals in the second half is achieved with the contribution of all the groups (L1, L2, and L3), the consistently higher goal scoring of L1 teams in both halves may provide them the opportunity for easy and wide range wins, as reported by recent study (Bekris et al., 2014).

Goal scored per 15min period

The results showed that L1 teams are superior to L2 and L3 teams in all the 15-min periods of the first half while L2 and L3 do not differ significantly. Thus the ability to score more goals in the beginning of the game is a significant index that discriminates top class teams (L1). The current study concludes similar findings with Michailidis et al. (2013) study suggested that teams who scored the first goal were the winner of the game (70,97%). During the 2010 World Cup in the group stage, the team who scored the first goal had 66,7% of victories (Bordonau et al., 2013). Concerning the second half the superiority of goals scored for L1 teams remain significant in all the comparisons with L2 and L3 teams which indicate that their scoring performance

increase their ability to achieve wide range victories. Furthermore, L2 teams score significantly more goals (0,26± 0,09) than L3 teams (0,18± 0,05) only in 75-90min period. This last period is very crucial for determining the final result of the game. This difference is also very important for L2 teams to increase their scoring superiority in the last period so as to gain points against teams with similar targets, especially when the goal difference is minimal or in one goal. Although past studies support our findings concerning the increase of goals scored in the last 15min period, they do not define the level of the teams (Armatas et al., 2009; Njororai, 2013). In conclusion, the current study shows that teams who relegate for a lower league (L3) are significantly disadvantaged in their scoring ability in the last period compared to their opponents. Thus, a possible goal scored increase in the last period may support them to remain to the league.

Goals conceded
Regarding goals conceded it was found that L1 teams concede significantly less goals (0,95± 0,3) than L2 (1,35± 0,29) and L3 teams (1,72± 0,22) per game. Also L2 teams concede significantly less goals than L3 teams. Thus it is obvious that defensive tactics is considered a crucial determinant of the final league ranking. Similarly, Delgado-Bordonau et al. (2013) concluded that successful national teams of 2010 World Cup conceded significantly less goals (0,8± 0,9 goals per game) than unsuccessful teams which conceded 1,5± 1,3 goals per game.

Goals conceded per half
A crucial finding of the current study was that L1 teams concede less goals (0,41± 0,13) than L2 (0,59± 0,18) and L3 teams (0,8± 0,16) which is due to the periods 0-15min and 15-30min. Interestingly, between 30-45min period there are no significant differences among the three groups of teams. It seems that defensive performance in the first half and especially 0-30min period consist a crucial interval that affects the final league ranking. Furthermore, the study shows that L1 teams (0,53± 0,19) take a significant advantage against L2 (0,76± 0,18) and L3 (0,91± 0,21) while L2 and L3 teams do not differ significantly in any period of the second half. During 45-60min period there are no significant differences among groups concerning their defensive performance. Thus, for 30min (30-60min) L1, L2 and L3 groups do not differ significantly in their defensive play. However, during 60-75min as well as 75-90min L1 perform better in their defensive play than L2 and L3 groups ($p< ,001$). Thus, it seems that during 60-90min period L1 maintain a defensive advantage that begins from the first half compared to other groups. Furthermore, during 75-90min period L2 teams concede the same goals with L3 teams, but they achieve more goals than L3 teams, that probably affect the final ranking of the two groups. The last minutes of a game teams take higher risks to achieve a desired result that probably creates open areas in the defensive area of losing teams. This situation consist a cause that teams conceded more goals in the second half than in the first.

Goal difference during the whole game, per half, and per 15min period
The results showed that goal difference per game influences the final ranking of the team, as L1 (0,87± 0,68) are significantly better than L2 (-0,18± 0,29) and L3 (-0,77± 0,31), while L2 are significantly better than L3 during the whole game. Similarly, during the first half L1 (0,38± 0,3) are superior to L2 (-0,07± 0,2) and L3 (-0,38± 0,25), while L2 are superior to L3. Interestingly, during 0-15min period there is no significant difference between L1, L2, and L3 groups. As the game progresses L1 develop a goal difference and reveal significant better performance than the other two groups especially during 15-45min period. Although, L2 and L3 teams do not differ significantly in 0-15min and 15-30min periods, during 30-45min period L2 obtain an advantage concerning goal difference in the first half. Also during the second half L1 teams reveal a significant goal difference (0,48± 0,45) compared to L2 (-0,12± 0,24) and L3 teams (-0,38± 0,23) as a result of 45-75min period. In the second half, goal difference is obviously improved for L1 teams, finding that reveals their ability to expand it because of their higher performance. Although, L2 teams maintain a significant better goal

difference than L3 teams in the second half, they do not perform any significant difference in any 15min period. In conclusion, successful teams stand out from the first half and do not expect the second half to overtake the others either in offensive or in defensive play. It also seems that unsuccessful teams (L3) present a consistent poor goal difference performance from the first half, which is not improved in the second half although there are not significant differences with L1 and L2 teams during the 75-90min period. A possible explanation is that L1 teams have developed the condition for a successful result before the 75th minute of the game. Similarly, L2 teams present a consistent better goal difference performance during the whole game that gives them the desired result. Adding that some factors that determine performance, especially during the second half, such as fatigue, fluid balance, lapses in concentration, tactical choices, technical abilities and psychological parameters, are more possible to affect strongly the weaker teams of the league (L3). It is obvious, that coaching decisions, as well as the number, the time and the quality of substitutions may affect the above mentioned factors and consequently the final result.

Scoreline is a very important factor that plays a crucial role in coach's decisions. Indeed, it has been found that when in FA Premier League games the current score is a draw, the intensity of the game is higher (O'Donoghue & Tenga, 2001) while the top-3 teams have lower ball possession percentage (Bloomfield et al., 2005). Obviously, when lower level teams are close to the score create difficult situations to those of higher level. Substitutions may support their teams by covering any technical and tactical needs and physical conditions weaknesses. Previous studies confirm this suggestion as they concluded that high-intensity running was greater in substitutes compared with players who either completed the entire match or were replaced. Especially players that play in offensive positions covered more high-intensity running than peers or their own performances when completing the entire match (Bradley, Lago-Peñas, & Rey, 2014). In addition, Carling, Bloomfield, Nelsen, and Reilly (2008) suggested that substitute players have been shown to cover significantly more ground at high intensity during the final 15min period than the other players already on the pitch. The most important factor explaining the appropriate timing of substitutions was the score (Del Corral, Barros, & Prieto-Rodríguez, 2008). Current study concludes that from the first half as well as during 45-75min period there have been significant differences in performance across teams, and it is necessary for a coach to react quickly with a substitution. Bradley et al. (2014) support our suggestions as they concluded that most substitutions occurred at half-time and between the 60-85min period. They also found that these substitutions become more offensive (eg, more attacking positions were introduced) in relation to the positions introduced as the half progressed (Bradley et al., 2014). Literature review also showed that in 2004-05 Spanish First Division, defensive substitutions are made later in the match than offensive substitutions (Del Corral et al., 2008). Thus it is obvious that teams which seek to change a negative result increase their offensive play with a substitution. Although score changes was not examined in the current study, successful teams build their victories from the first half, while L2 and L3 teams need to change the situation with an offensive substitution.

In conclusion, it has been found that top level teams perform consistently higher in both the offensive and defensive play during the whole game compared to other groups of teams. They also develop the conditions to win a game from their performance in the first half. On the other hand, teams which take the positions between European promotion and relegation teams, perform higher performance (goal difference) than relegation teams. This difference begins in the first half mainly because of their stronger defense. The study also showed that top level teams are superior to other groups in offensive play, while group that ranked in the middle of the league scored more goals in the last 15 minutes than relegation group. Coaches have to improve their team performance from the first half so as to be close to their targets during the second half. Furthermore, they have to make the appropriate substitutions on time so that prevent poor periods performance and to peak their defensive and offensive play.

REFERENCES

Abt, G. A., Dickson, G., & Mummery, W. K. (2002). 16 Goal Scoring Patterns Over the Course of a Match: An Analysis of the Australian National Soccer League. Science and football IV, 4, 106.

Apor, P. (1988). Successful formulae for fitness training. In T Reilly, A Lees, K Davids K & W J Murphy (Eds.), Science and football (pp. 95-107). London: E & FN Spon.

Armatas, V., Yiannakos, A., Galazoulas, C., & Hatzimanouil, D. (2007a). Goal scoring patterns over the course of a match: Analysis of Women's high standard soccer matches. Physical Training, 1(1).

Armatas, V., Yiannakos, A., Papadopoulou, S., & Skoufas, D. (2009). Evaluation of goals scored in top ranking soccer matches: Greek "Super League" 2006-07. Serbian Journal of Sports Sciences, 3(1), 39-43.

Armatas, V., Yiannakos, A., & Sileloglou, P. (2007b). Relationship between time and goal scoring in soccer games: Analysis of three World Cups. International Journal of Performance Analysis in Sport, 7(2), 48-58. https://doi.org/10.1080/24748668.2007.11868396

Aziz, A. B., Newton, M. J., Kinugasa, T., & Chuan, T. K. (2007). Relationship between aerobic fitness and league positional ranking of clubs in a professional soccer league over three competitive seasons. Football Science, 4, 9-18.

Bekris, E., Gioldasis, A., Gissis, I., Komsis, S., & Alipasali, F. (2014). Winners and losers in top level soccer. How do they differ? Journal of Physical Education and Sport 14(3), 398-405.

Bekris, E., Louvaris, Z., Souglis, S., Hountis, K., & Siokou, E. (2005, April). Statistical analysis of the ability of shot in high standard matches. In First International Scientific Congress in Soccer, Trikala, Greece.

Bekris, E., Mylonis, E., Sarakinos, A., Gissis, I., Gioldasis, A., & Sotiropoulos, A. (2013). Offense and defense statistical indicators that determine the Greek Superleague teams placement on the table 2011-12. Journal of Physical Education and Sport. 13(3), 338-347.

Bloomfield, J. R., Polman, R. C. J., & O'Donoghue, P. G. (2005). Effects of score-line on team strategies in FA Premier League Soccer. Journal of Sports Sciences, 23(2), 192-193.

Bradley, P. S., Lago-Pe-as, C., & Rey, E. (2014). Evaluation of the match performances of substitution players in elite soccer. International Journal of Sports Physiology and Performance, 9(3), 415-424. https://doi.org/10.1123/ijspp.2013-0304

Cachay, K. & Thiel, A. (2000). Soziologie des Sports. München: Juventa-Verlag.

Carling, C., Bloomfield, J., Nelsen, L., & Reilly, T. (2008). The role of motion analysis in elite soccer: contemporary performance measurement techniques and work rate data. Sports medicine, 38(10), 839. https://doi.org/10.2165/00007256-200838100-00004

Carling, C., Reilly, T., & Williams, A. M. (2008). Performance assessment for field sports. Routledge.

Carling, C., Williams, A. M., & Reilly, T. P. (2005). The handbook of soccer match analysis: A systematic approach to performance enhancement. London: Routledge. https://doi.org/10.4324/9780203448625

Castellano, J., Casamichana, D., & Lago, C. (2012). The use of match statistics that discriminate between successful and unsuccessful soccer teams. Journal of Human Kinetics, 31(1), 137-147. https://doi.org/10.2478/v10078-012-0015-7

Çebi, M., Eliöz, M., İmamoğlu, I., & Yamak, B. (2016). Журнал науковий Огляд, 10(31).

Del Corral, J., Barros, C. P., & Prieto-Rodríguez, J. (2008). The determinants of soccer player substitutions: a survival analysis of the Spanish soccer league. Journal of Sports Economics, 9(2), 160-172. https://doi.org/10.1177/1527002507308309

Delgado-Bordonau, J. L., Domenech-Monforte, C., Francisco Guzmán, J., & Mendez-Villanueva, A. (2013). Journal of Human Sport & Exercise, 8(4), 894-904. https://doi.org/10.4100/jhse.2013.84.02

Garganta, J., Maia, J., & Basto, F. (1997). Analysis of goal-scoring patterns in European top level soccer teams. In Reilly, T., Bangsbo, J., & Hughes, M. (Eds). Science and Football III (pp. 246-250). London: E. & F. Spon.

George, D., & Mallery, M. (2010). SPSS for Windows Step by Step: A Simple Guide and Reference, 17.0 update (10a ed.) Boston: Pearson.

İmamoğlu, O., Çebi, M., & Eliöz, M. (2011). Dünya Kupasındaki Gollerin Teknik ve Taktik Kriterlere Göre Analizi. Türkiye Kickboks Federasyonu Spor Bilimleri Dergisi, 4(2).

Jinshan, X., Xiakone, C., Yamanaka, K., & Matsumoto, M. (1993). Analysis of the goals in the 14th World Cup. In Reilly, T., Clarys, J., & Stibbe, A. (Eds). Science and Football II (pp. 203-205). London: E. & F. Spon.

Kalapotharakos, V. I., Strimpakos, N., Vithoulka, I., Karvounidis, C., Diamantopoulos, E., & Karpeli, E. (2006). Physiological characteristics of elite professional soccer teams of different ranking. Journal of Sports medicine and Physical fitness, 46(4), 515.

Kapidžić, A., Mejremić, E., Bilalić, J., & Bečirović, E. (2010). Differences in some parameters of situation efficiency between winning and defeated teams at two levels of competition. Sport SPA 7(2), 21-28.

Lago, C., Lago, J., & Rey, E. (2011). Differences in performance indicators between winning and losing teams in the UEFA champions league. Journal of Human Kinetics, 27(1), 135-146.

Martinez, L., & Lago, J. (2007). Analysis of offensive playing patterns in soccer. Journal of Sports Science & Medicine, 6(s10), 199-209.

Michailidis, C., Michailidis, I., Papaiakovou, G. & Papaiakovou, I. (2004). Analysis and evaluation of way and place that goals were achieved during the European Champions League of Football 2002-2003. Sports Organization, 2(1), 48-54.

Michailidis, Y., Michailidis, C., & Primpa, E. (2013). Analysis of goals scored in European Championship 2012. Journal of Human Sport & Exercise, 8(2), 367-375. https://doi.org/10.4100/jhse.2012.82.05

Njororai, W. W. S. (2013). Analysis of goals scored in the 2010 world cup soccer tournament held in South Africa. Journal of Physical Education and Sport, 13(1), 6.

O'Donoghue, P., & Tenga, A. (2001). The effect of score-line on work rate in elite soccer. Journal of Sports Sciences, 19(1), 25-26.

Olsen, E. (1988). An analysis of goal scoring strategies in the World Championship in Mexico 1986. In Reilly, T., Lees, A., Davids, K., & Murphy, W. J. (Eds). Science and Football (pp. 373-376). London: E. & F. Spon.

Sotiropoulos, A., Mitrotasios, M., & Traulos, A. (2005, April). Comparison in goal scoring patterns between Greek professional and amateur teams. In 1st International Scientific Congress in Soccer, Trikala, Greece, 8Á10 April.

Wisløff, U., Helgerud, J., & Hoff, J. (1998). Strength and endurance of elite soccer players. Medicine and Science in Sports and Exercise, 30, 462-467. https://doi.org/10.1097/00005768-199803000-00019

Wright, C., Atkins, S., Polman, R., Jones, B., & Sargeson, L. (2011). Factors associated with goals and goal scoring opportunities in professional soccer. International Journal of Performance Analysis in Sport, 11(3), 438-449. https://doi.org/10.1080/24748668.2011.11868563

Yiannakos, A., & Armatas, V. (2006). Evaluation of the goal scoring patterns in European Championship in Portugal 2004. International Journal of Performance Analysis in Sport, 6(1), 178-188. https://doi.org/10.1080/24748668.2006.11868366

Zubillaga, A., Gorospe, G., Mendo, A. H., & Villase-or, A. (2007). Match analysis of 2005-06 Champions League Final with Amisco system. Journal of Sports Science & Medicine, 6(10), 20.