

CORRELATION BETWEEN SHOOTING ACCURACY, AVERAGE AGE AND RANKING POSITION IN THE TOP SOCCER LEAGUES OF ROMANIA, CROATIA AND TURKEY.

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Abstract

Aim. The main objective of the study is to investigate and establish the relationship between shooting accuracy to the goal and final ranking in the top football divisions of three Balkan countries. The study was done for Romania, Croatia and Turkey for the season 2023/2024.

Methods. Collecting data from the three leagues surveyed for the 23/24 season and analyze the resulting metrics using mathematical and statistical methods. Comparing the three leagues and drawing conclusions and recommendations.

Results. The results were obtained after analyzing all 680 matches from the observed professional leagues. The data was analyzed using Pearson correlation of coefficient. A high correlation was found between average age and goal-shooting accuracy towards the final ranking.

Conclusions. We can conclude that shooting at goal is not of particular importance, and the accuracy and frequency of accurate shots on goal in 90 minutes are fundamental to the final ranking. Average age is strongly correlated with accurate shots on goal, proving that more experienced players would contribute to a better ranking at the end of the championship.

Keywords: shooting; soccer, professional football, average age, shooting accuracy.

Introduction

The popularity of football is widespread across the globe. The accessibility and elementary rules make it a game that is played by 3-year-olds in kindergartens to adult men and women in all countries (Ignatov et al., 2016). The most important principle of the game is to score more goals than the opponent. Scoring goals is the crucial element of top and elite teams (Oghonyon et al., 2020). So, the accuracy of shooting affects the outcome of the match.

However, football is a team game that requires a wide range of motor skills, such as running, sprinting and jumping at different speeds (Cekova, 2016; Attene, et al., 2016; Gutev et al., 2021). Players often have to change direction at maximum speed during a match with little time for rest and recovery (Sheppard & Young, 2006). But also football consist a different types of movement specific for the game like: tackling, kicking, shooting, holding the ball and etc (Reilly et al., 2000). One of the specific motor skills, which should be at a high level, is a shooting ball accuracy (Gardasevic & Bjelica, 2019). The shooting ball accuracy is considered as the very important ability of the soccer player. A good soccer player is the one who is able to perform complex situational-motor actions coordinated in a certain space and in time period as short as possible and with good shooting ball accuracy (Corluka, et al., 2018). In the course of competition, the accuracy, economy and speed of individual and group actions form the parameters of performance in a specific way, as collective technical-tactical efficiency. In fact, the goal ratio reflects the activity and effectiveness of team actions (Simeonov, 2014).

Study of Engler et al., (2023) successfully demonstrated that the shooting quality is an indicator for the overall soccer performance of a young player and they shows that it was possible to draw conclusions about the overall soccer skills based on the shooting quality. Other authors have argued that not only offensive but also defensive and contextual dimensions significantly influence the determination of shooting performance in European professional football (Gonzalez-Rodenas et al., 2020). Another study found that not only is the phase of play important (i.e., corner, free kick, open play, counterattack, etc.), but also strategic characteristics such as the proximity of defenders, interaction of surrounding players, speed of play, combined with the location of the shot, influence the determination of a team's likelihood to score (Lukey et al., 2015).

At the 1998, 2002, 2006 and 2010 World Cups and the 2008 European Championship, teams that took more accurate shots on goal performed significantly better (Castellano et al., 2012; Grant et al., 1999; Janković et al., 2009; Janković A et al., 2011a; Kapidžić et al., 2010; Roxburg, 2008). Other research has shown that shots on target only affect outcomes over a wide range. This is probably explained by the fact that players shooting from long range execute shots better due to greater technical and tactical skills than their opponents. Therefore, it is evident that long-range goals are related to the total number of shots, while short- and long-range shots are related to the accuracy of the shots and the technique of execution (Evangelos et al., 2014).

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In addition, to our knowledge, there is a lack of in-depth research on the relationships between shots on goal, accuracy of shots on goal, shooting success rate, average age of teams taking the most shots, number of shots per game, and other significant components.

Objectives

The main objective of this study is to determine the relationships between shots on target, ball shooting accuracy and other indicators in three professional leagues in 2023/2024 - Liga 1 (Romania), Hrvatska NL (Croatia). Süper Lig (Turkey).

Methods

Our research was a study of correlation, and we use Microsoft® Excel for Mac, version 16.85.

The main objective is to determine the relationships between shots on target, ball shooting accuracy and other indicators in three professional leagues in 2023/2024 - Liga 1 (Romania), Hrvatska NL (Croatia). Süper Lig (Turkey).

For the purpose of our research, we used data from the free football statistics website "FBREF" (Forman, 2024).

The data obtained from the study were analyzed using descriptive and correlational statistics. In the area of comparative statistics, we determined the differences in variables between the study leagues.

A total of 46 professional football clubs from the first division of Romania, Turkey and Croatia were included in the evaluation of the studied indicators. The average age of teams in Romania is min=26,8/max=30,1 years, Turkey min=26,1/max=30,5 years and Croatia min=24,4/max=27,3 years.

In the evaluation, the exclusion criteria were: (1) position in the final standings (Pos); (2) average age of the team (average age); (3) goals scored (Gls); (4) shots (Sh); (5) shots on goal (SoT); (6) percentage of accurate shots on goal (SoT%); (7) shots per 90 minutes (Sh/90); (8); goal per shoot (G/Sh); (9) goals per shot on target (G/SoT); (10) goals from penalty kick (PK goals); (11) penalty kicks attended (PKatt).

Results

The study included n=1621 professional football players from the investigated countries (Romania n=592; Croatia n=416; Turkey n=612). Average age of players in Croatian league is 26,1 years, min (Figure 1), in Romanian Liga 1 is 28,15 years (Figure 2) and Super Lig in Turkey is 29 years (Figure 3).

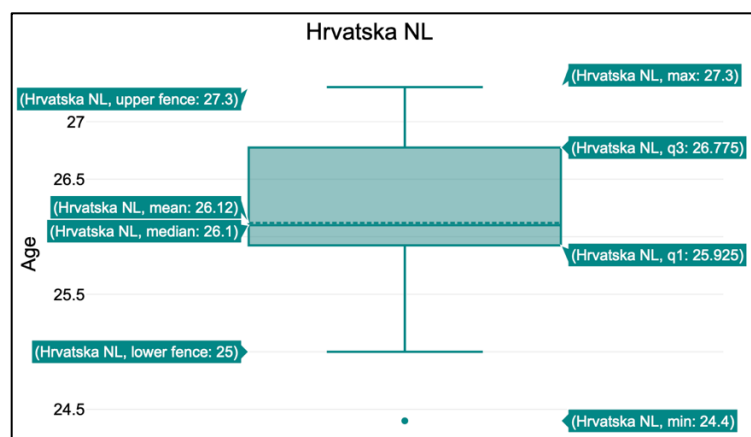


Figure 1. Descriptive analysis of age in Hrvatska NL

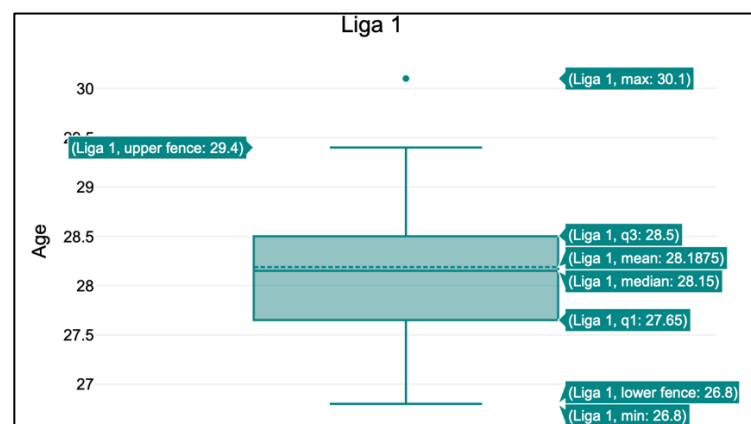


Figure 2. Descriptive analysis of age in Liga 1

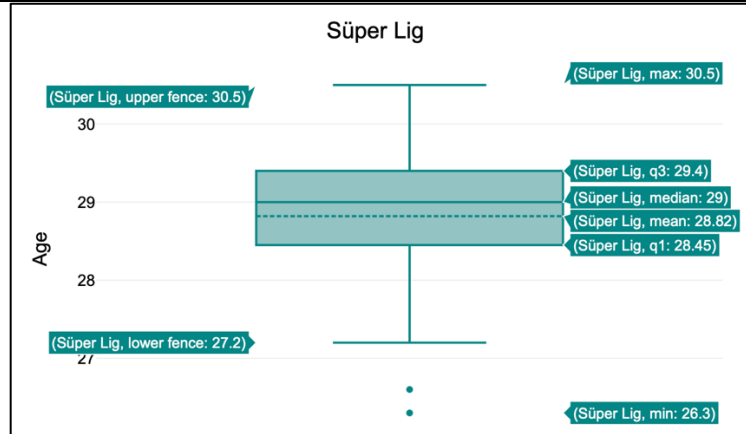


Figure 3. Descriptive analysis on age in Super Lig.

Correlation analysis in the Croatian First League (shows that the final league standings have a very strong statistical correlation with shots on target ($r=-0,942$) as well as shots on target per 90 minutes ($r=-0.942$). Goals scored ($r=-0,891$) and total shots on target ($r=-0,891$) correlate strongly with the final ranking of the teams. There is no correlation between the average age of the team and the examined indicators. No correlation was seen between the average age of the teams and the indicators examined. A weak correlation ($r=0,261$) was reported only with the percentage of accurate shots. Logically, we can notice a very strong correlation between goals scored and shots, shots on target, shots per 90 minutes, shots on target per 90 minutes.

Table 1) shows that the final league standings have a very strong statistical correlation with shots on target ($r=-0,942$) as well as shots on target per 90 minutes ($r=-0.942$). Goals scored ($r=-0,891$) and total shots on target ($r=-0,891$) correlate strongly with the final ranking of the teams. There is no correlation between the average age of the team and the examined indicators. No correlation was seen between the average age of the teams and the indicators examined. A weak correlation ($r=0,261$) was reported only with the percentage of accurate shots. Logically, we can notice a very strong correlation between goals scored and shots, shots on target, shots per 90 minutes, shots on target per 90 minutes.

Table 1. Correlation analysis in Hravatska NL

	Position	Average age	Gls	Sh	SoT	SoT%	Sh/90	SoT/90	G/Sh	G/SoT	PK	PKatt
Position	1											
Average age	0,14465527	1										
Gls	-0,8917577	-0,272227	1									
Sh	-0,8910118	-0,3373346	0,91691548	1								
SoT	-0,9423464	-0,1744121	0,92275044	0,9196066	1							
SoT%	-0,412853	0,26154458	0,31489679	0,12116502	0,49682492	1						
Sh/90	-0,8911841	-0,3370892	0,9168691	0,99999967	0,919648	0,12128247	1					
SoT/90	-0,9423317	-0,1727788	0,92222398	0,91946466	0,99999654	0,49706328	0,9195068	1				
G/Sh	-0,6120538	-0,1067418	0,81874276	0,53542393	0,63323567	0,44432546	0,53541727	0,63237022	1			
G/SoT	-0,4051275	-0,1835257	0,71181089	0,45721877	0,4173222	0,06972567	0,45714819	0,4161915	0,91504159	1		
PK	-0,6844156	-0,3484952	0,67384583	0,77871598	0,63608887	-0,1363322	0,77852719	0,63639073	0,282013	0,25235382	1	
PKatt	-0,7701296	-0,3464392	0,76657003	0,8652206	0,72041097	-0,0943158	0,86510132	0,72055265	0,38473452	0,35320008	0,97311061	1

In the Turkish first league, correlation analysis (

Table 2) shows that there is no statistical significance between the final ranking and the average age of the teams, as well as the percentage of accurate shots. With a moderate correlation being goals scored ($r=-0,412$), shots ($r=-0,320$), shots on target ($r=-0.344$) for the teams position. Average age is moderately correlated with all other indicators. Logically,

we can notice a very strong correlation between goals scored and shots, shots on target, shots per 90 minutes, shots on target per 90 minutes.

Table 2. Correlation analysis in Super Lig

	Position	Average age	Gls	Sh	SoT	SoT%	Sh/90	SoT/90	G/Sh	G/SoT	PK	PKatt
Position	1											
Average age	0,13689576	1										
Gls	-0,4127071	0,31072279	1									
Sh	-0,3204899	0,31811541	0,94066391	1								
SoT	-0,3448347	0,33122354	0,94927715	0,94373873	1							
SoT%	0,01777972	0,33572899	0,49975235	0,38590127	0,63595038	1						
Sh/90	-0,2769696	0,33912693	0,93773088	0,99793832	0,94093259	0,40855027	1					
SoT/90	-0,2403559	0,37902194	0,94179293	0,9450412	0,98763	0,66330112	0,95207258	1				
G/Sh	0,32992292	0,45562992	0,55667724	0,58645169	0,55065008	0,54170928	0,63706371	0,67442335	1			
G/SoT	0,27942538	0,44572461	0,59866249	0,61614945	0,56457548	0,50339729	0,66460352	0,68495279	0,99440637	1		
PK	-0,1444265	0,44696191	0,73006194	0,72200144	0,72104359	0,37392342	0,72661577	0,73214887	0,48706373	0,4852791	1	
PKatt	-0,0826214	0,45121755	0,79630139	0,77212789	0,79578498	0,48860995	0,781696	0,81604075	0,58776773	0,58719511	0,94583579	1

In the Romanian championship, correlation analysis shows that higher age and shots on target per 90 minutes have no impact on the final ranking, but goals scored strongly correlate ($r=-0.808$) with position at the end of the championship. Higher average age did not correlate with the metrics examined and only a weak correlation was seen with shots on target per 90 minutes ($r=0,064$), goals per shots ratio ($r=0,066$), and goals per shots on target per 90 minutes ($0,067$), which did not reach statistical significance.. Logically, we can notice a strong and a very strong correlation between goals scored and shots, shots on target, shots per 90 minutes, shots on target per 90 minutes.

Table 3. Correlation analysis in Liga 1

	Position	Average Age	Gls	Sh	SoT	SoT%	Sh/90	SoT/90	G/Sh	G/SoT	PK goals	PKatt
Position	1											
Average Age	0,5036292	1										
Gls	-0,8082313	-0,4585036	1									
Sh	-0,7448883	-0,5120535	0,84920352	1								
SoT	-0,7594906	-0,5182053	0,92225363	0,92029754	1							
SoT%	-0,4529835	-0,2750565	0,67311463	0,39953585	0,72423996	1						
Sh/90	-0,7178902	-0,5070702	0,82705682	0,99794406	0,90578247	0,37114039	1					
SoT/90	0,19087091	0,06478331	-0,2151545	0,06204078	-0,048868	-0,1920244	0,09081283	1				
G/Sh	0,19203915	0,06639961	-0,2149963	0,05991156	-0,050524	-0,1919831	0,08866158	0,99998091	1			
G/SoT	0,19447972	0,06788468	-0,2184208	0,05746112	-0,0539904	-0,1958139	0,08629183	0,99997702	0,99999017	1		
PK goals	-0,7794333	-0,3742695	0,60780049	0,43574193	0,55318485	0,51902602	0,39932086	-0,3336798	-0,3353056	-0,3370991	1	
PKatt	-0,6161407	-0,1080392	0,4922731	0,23865585	0,38544936	0,47764804	0,19295979	-0,4203528	-0,4208886	-0,4225551	0,85942065	1

Discussions

Shooting during a football match appear to be a fundamental part of the technical skills of football players. Naturally, quality and accuracy appear more essential to be able to win against the opponent in the official match.

Our research reveals the influence of the number of shots, their accuracy, their frequency and how many shots are needed to score in three Balkan countries. We notice in the study that the average age of the teams for the championships does not affect the final ranking. Croatia's champion has an average age of 26.9 years and the league average is 26.1 years, Turkey's champion is 29.2 years and the league average is 29 years. Interesting fact that the Romanian champion has an average age of 26.8, making it the youngest team in Romania. This proves the fact that you don't have to have the most experienced players to become a football champion. Of most importance to the final rankings was the accurate shots on goal in all three countries studied. While in Croatian the shots on goal per 90 minutes was the most important component.

The higher average age of teams in the Turkish championship affects all shooting performance in football matches with moderate dependence. The higher average age of the teams in the Turkish championship has a moderate effect on all shooting performances in football matches. In Romania and Croatia, on the other hand, the younger teams, has the lower shooting performance. In all three countries, the shooting indicators during the matches correlate very strongly with the goals scored, which is logical in view of the specifics of the football game.

If we look in detail only at the champion teams, we notice that these teams have the most shots to the opponent's goal per 90 minutes (Dinamo Z. SoT/90=5,85; FCSB SoT/90=5,30; Galatasaray SoT/90=6,73). The three teams' goal-to-shot ratio (G/Sh) is 0.10, which means that every 10th shot is a goal. To give further insight on the quality of shots in the three champion teams, we see that their G/SoT indicators prove that every 4th shot on the target is a goal.

Conclusions

Based on the results obtained, the discussion and the author's professional experience in the football, we can conclude that shooting towards the goal is a major technical-tactical component determining high sports results.

One of the basic techniques in the game of football is shooting. The optimal execution of the kick requires excellent physical ability and perfect mastery of the technique, with an excellent physical condition that will support the emergence of footballers in the execution of shoots.

The results obtained can be used to innovate the plans and work programmes of the youth and men's teams, making it easier to adapt to the demands of European football.

When developing young players in the soccer academy, shooting on goal should be a top developmental priority in the training process. Individual drills for shot technique (Gutev, 2023) and real game situations (Ivanov & Lovkov, 2023; Ivanov & Gadzhev, 2020) with an opponent should be incorporated into weekly micro-cycles for all age groups in soccer.

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