

Factors affecting the effectiveness of the pick and roll offense at the 2017 European Men's Championship

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Abstract

The evolution of basketball made the game faster, leading coaches to increase the use of pick and roll cooperation in offense. The purpose of this research was to investigate the performance time of the pick and roll every five minutes, the pair of players who participated in the pick and roll and the offensive action of the ball handler after the screen, in the European Men's Championship of 2017. The sample of the research was the sixteen games of the second round of the Championship. The instrument used for the analysis of the matches was the SportScout STA Version 3.2. Analysis with χ^2 (Chi-square) was used. In the results analysis, a total of 714 screens were found, of which 356 were successful (49.9%) and 358 (50.1%) failed. Most pick and rolls were performed in the second five-minute span of the third period of the games (14.8%) and in the first five-minute span of the first period (14.1%). Regarding the pairs of players participating in the action, most of them had the guard as the ball handler and the center as the screener (63.4%). In about 60% of the pick and rolls the ball handler chose to finish the action himself either by driving to the basket (31.8%) or with a shot (28.6%). The results of this study provide more information and directions to basketball coaches in order for them to better organize their training and maximize the offe-

nsive performance of their teams.

Keywords basketball • offense • pick and roll • video analysis.

Introduction

The tactic is one of the important parts that make up the athletic performance in basketball (Kellis, 1999) which is characterized by complexity, since the situations presented at the level of defensive and offensive tactics are many and different from each other (Anastasiadis, 1995). According to Marmarinos, Apostolidis, Kostopoulos, & Apostolidis (2016), the better the cooperation of the players in these situations, the greater the chance of success in the match.

The evolution of the game, especially in defense, and the regulations that made the game faster, led the coaches to increase the use of screens, and especially pick and roll, on offense (Pianigiani & Banchi, 2008).

Screen offenses are divided into screens that can be done to an athlete with or without the ball. The screens used on the athlete who has possession of the ball are the hand off cooperation or the pick and roll. Pick and roll is a screen that sets a player without the ball on the defensive player guarding the player with the ball in order to create the conditions that will help their team to score. It is one of the most common and simplest ways of offensive tactics in basketball, which, if performed correctly, the opposing defense will have trouble defending the offense (Koutsouridis, Karamousalidis, & Galazoulas, 2018). In addition,

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it is one of the most important ways for a team to finish its offense (Gómez, Battaglia, Lorenzo, Lorenzo, Jimenez, & Sampaio, 2015). Pick and roll is probably the most common offensive team tactic used by basketball players in games. In most offensive systems, there is a pick and roll action that needs special attention by the defence at the end of each possession (Huciński & Tymański, 2006).

Coaches need to know what distinguishes winning and losing teams in order to make the right decisions to improve their team's performance (Csataljay, O'Donoghue, Hughes, & Dancs, 2009). For this reason, the analysis of basketball performance is gradually gaining more and more importance (Koutsouridis et al., 2018). The effectiveness of the pick and roll has been investigated in various categories by many researchers. In men's championships, it has been researched in all the high categories, from the national teams that participated in the Olympic Games (Koutsouridis et al., 2018), to the World Championship, examined by Polykratis, Tsarmoutzis, Mavridis & Zaggelidis (2010) and Polykratis, Tsamourtzis, Karypidis, Mavridis & Christodoulos (2009), in teams that competed in the Euroleague by Marmarinos et al. (2016) as well as in national championships (Gómez et al., 2015, Remmert & Chau, 2018, Vaquera, Cubillo, García-Tormo, & Morante, J. C. (2013), Vaquera, García-Tormo, Gómez Ruano & Morante, 2016). In addition to effectiveness, it has been investigated whether the offense was organized or not, the place of execution of the pick and roll, the time of possession of the ball, the period of the match in which the pick and roll was performed, and the result of the offense. Kappa coefficients were measured and Kappa values were obtained for each variable. According to the results, the variables of the time of ball possession and the period of the match when the pick and rolls were performed had the greatest objectivity, while the variable that determined whether or not the pick and roll and its execution position were organized, had high objectivity. It has been observed that no research has studied the effectiveness of pick and roll in the European Championships. The purpose of this study was to evaluate specific parameters of the pick and roll offense in the 2017 European Men's Championship and how these affect its effectiveness.

Method

Sixteen matches from the second round of the European Men's Championship of 2017 constituted

the sample of the research. The 8 matches of the best sixteen teams, the 4 matches of the quarterfinals of the eight best teams, the 2 matches of the semifinals of the four best teams, the small final between the losing teams of the semifinals, and the final of the tournament between the winning teams of the semifinals were counted. Specifically, the sixteen best teams in the Men's European Championship 2017 were (in the final ranking): 1) Slovenia 2) Serbia 3) Spain 4) Russia 5) Latvia 6) Germany 7) Italy 8) Greece 9) Lithuania 10) Croatia 11) Finland 12) France 13) Montenegro 14) Turkey 15) Ukraine and 16) Hungary. The authors choose those games due to the importance of them. The winner of each game advances to the next stage and has a chance to win the final game.

Recording instruments

The instrument used for the analysis of the matches was the SportScout STA Version 3.2. SportScout STA is video analysis software that allows the user to quickly and easily manage videos from the games that interest him.

Recording process

Two observers recorded the sequences of the games. They graduated in sports science, with at least four years of experience as assistant coaches in the A1-A2 division. Inter-rated reliability between observers was 0.99.

The variables investigated in this study were the execution time of the pick and roll every five minutes (5'), the pair of players who participated in the pick and roll, the actions that the ball handler and the screener chose to make after the pick and roll and the successful-failed ratio.

The authors decided that a pick and roll was characterized as successful primarily when one of the two offensive players participating in the action scored a two-point field goal, a three-point field goal or was fouled during the shot. Furthermore, the authors characterized a pick and roll as successful when one of the two players while scoring a two point or a three-point field goal gained a free throw (and-one). A pick and roll was also characterized as successful when the defense fouled one of the players participating in the action, before the shot was executed, and the defensive team was over the foul limit, leading the player to shoot free throws.

A pick and roll was characterized as failed when the shooter missed his two point or three point field goal attempt. Furthermore, a pick and roll was

characterized as failed when after the pick and roll the shooter's field goal attempt was blocked or when one of the two offensive players participating in the action made a mistake (turnover).

The players were divided into three positions, according to FIBA: (<http://www.fiba.basketball/eurobasket/2017>): Guards, Forwards and Centers. Actions when the ball is passed to any of the players who did not participate in Pick and Roll were not included.

The statistical package IBM SPSS Statistics 24 was used for the statistical analysis, and the significance level was set at $p < 0.05$. Descriptive statistical analysis (mean, standard deviations) and frequency analysis were performed. Frequency analysis and Crosstabs with χ^2 (Chi-square test) analysis were also performed to investigate differences between the variables.

Results

A total of 714 screens were found, of which 356 were successful (49.9%) and 358 (50.1%) failed. Regarding the execution time of the offenses every five minutes most pick and roll actions were performed in the second five-minute span of the third period of the games ($n=106$, 14.8%) and in the first five-minute span of the first period ($n=101$, 14.1%). More than 90 successful (while leading to a basket) pick and roll were achieved in the second five-minute span of the fourth period of the games ($n=92$, 12.9%). Less than 80 were recorded in the second five-minute spans of the second period ($n=75$, 10.5%) and in the first five minutes of the third period ($n=78$, 10.9%). The five-minute spans with the most successful pick and roll actions were the second span of the third period ($n=55$, 15.4%), the second five-minute span of the fourth period ($n=53$, 14.9%), and the first five minutes of the first period ($n=48$, 13.5%). In no other five-minute spans were found more than 40 pick and rolls, except for the second five-minute span of the first period ($n=42$, 11.8%).

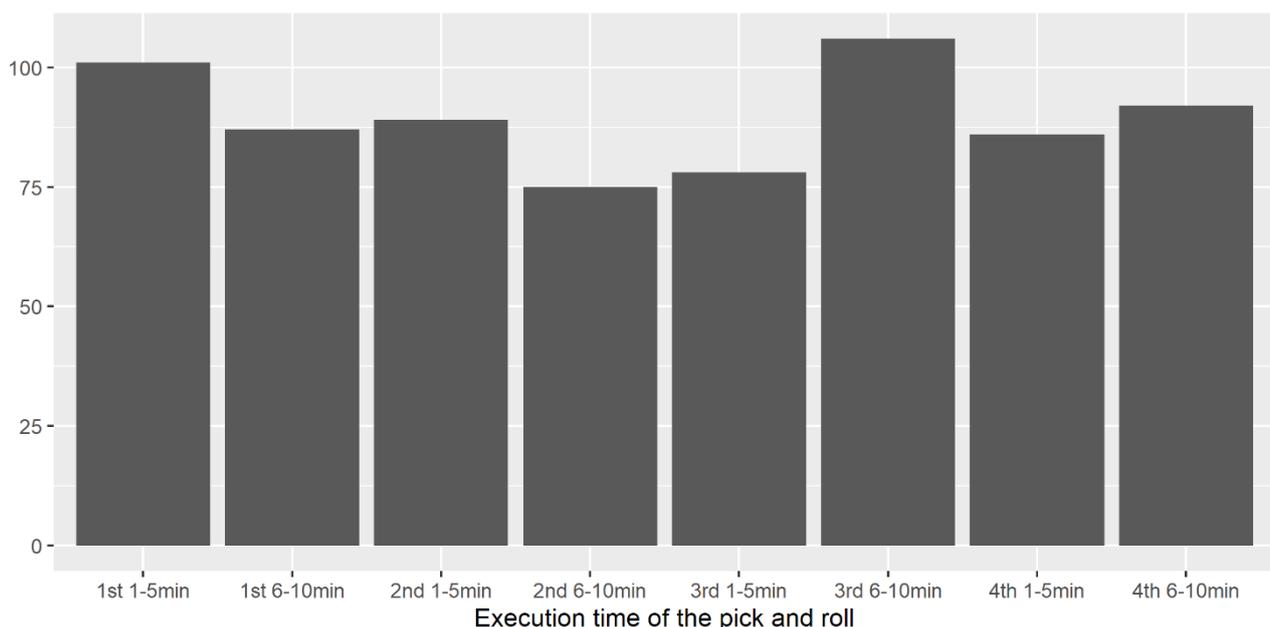


Figure 1. Frequency of occurrence of the pick and roll in terms of their execution time every five minutes

Regarding the pairs of players who participated in the pick and roll, most of them were performed with the guard as the ball handler and the center as the screener ($n=453$, 63.4%, Figure 2). The second most frequent pair of players in pick and roll and the only one from the rest that recorded a three-digit number of screens was the one with the guard as the ball

handler and the forward as the screener ($n=207$, 29%). No other pair of players was used more than 40 times with the pair that had the forward as a ball handler and the center as a screener being used 38 times (5.3%). The pair of players with the most successful pick and roll was the guard and the center ($n=218$, 61.2%) and followed that of the guard with

the forward (n=112, 31.5%). No other pair of players had more than 20 successful pick and roll with the forward and center pair having 13 successful screens

(3.7%) and also the pair that had a forward as a ball handler and another forward as a screener 12 (3.4%).

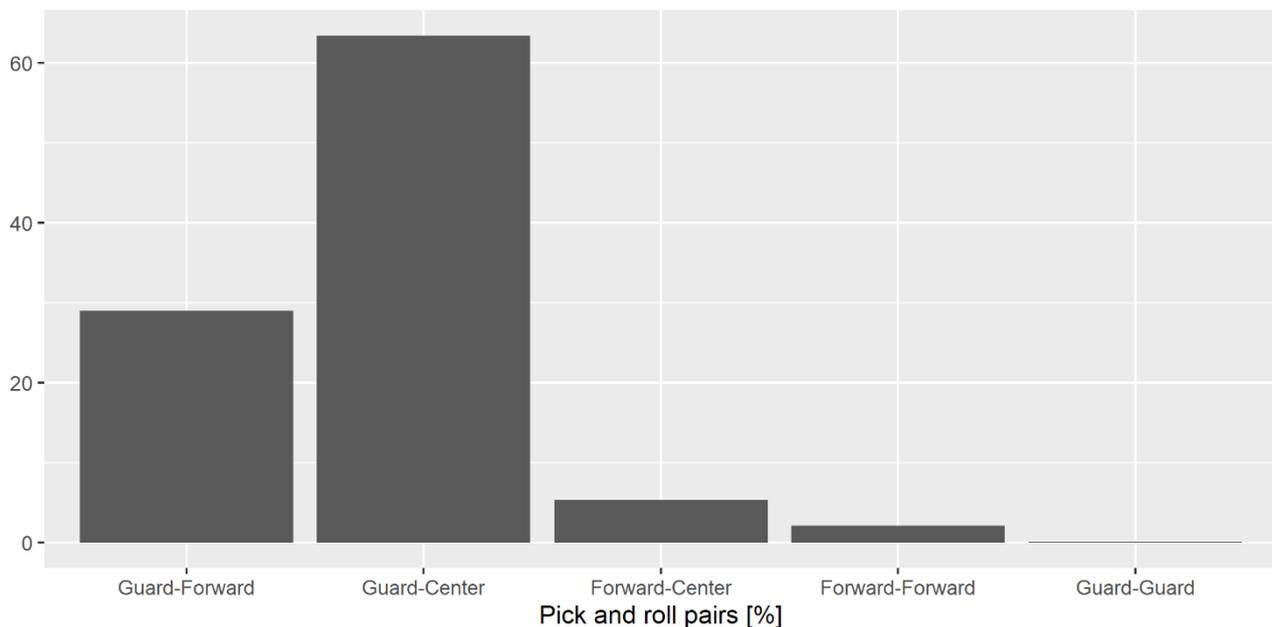


Figure 2. Frequency of occurrence of the pick and roll in terms of the pairs of players who participated in the pick and roll

In addition, the offensive moves that were chosen by the ball handler and the screener to take advantage of after the pick and roll were measured (Figure 3). In about 60% of the pick and rolls the ball handler chose to finish the action himself either by driving to the basket (n=227, 31.8%) or with a shot (n=204, 28.6%). In over 30% of the pick and roll the screener finished the offensive move. In most of them, the ball handler decided to pass to the screener who moved to the basket after the pick and roll (n=117, 16.4%), while in less than 60 pick and roll the handler passed to the screener who moved to the basket before the pick and roll was completed (early release, n=57, 8%) or passed to the screener who moved towards the perimeter, i.e. the three-pointer (n=54, 7.6%). At the end of the pick and roll, two different actions of the ball handler and the screener were recorded. Firstly, the defense choosing to double team the ball handler after the pick and roll and him deciding to complete the action himself or by passing to the screener (n=23, 3.2%). The second action was the ball handler's choice for a rescreen by the screener in order to go to the opposite side he chose initially (n=32, 4.5%). The most successful pick and rolls were observed when the ball handler chose to drive to the basket (n=122,

34.3%) and shoot (n=84, 23.6%). It is noteworthy that in the pick and rolls where the handler selected to use the screener, in addition to the screener cutting in the basket after the pick and roll (n=68, 19.1%) the screeners cut in the basket before the pick and roll action was completed was very successful (n=35, 9.8%).

The most successful pick and rolls resulted in a successful two-point shot (n=203, 57%). The offenses that resulted in a successful three-point shot were about a quarter of the offenses (n=91, 25.6%) while the offenses that resulted in only free shots were less than fifty, most of which were fouled by the attacking player in his attempt to make a shot (n=37, 10.4%). Fewer offenses resulted in free throws, when during the pick and roll a foul was committed by the defense on one of the two attacking players who participated in the pick and roll, thus exceeding the fouls that the defense can commit without the opposing team shooting free throws (n=9, 2.5%). Only the offenses in which the attacking player scored a two-point shot and performed one-shot were over 10 (n=13, 3.7%, Figure 4).

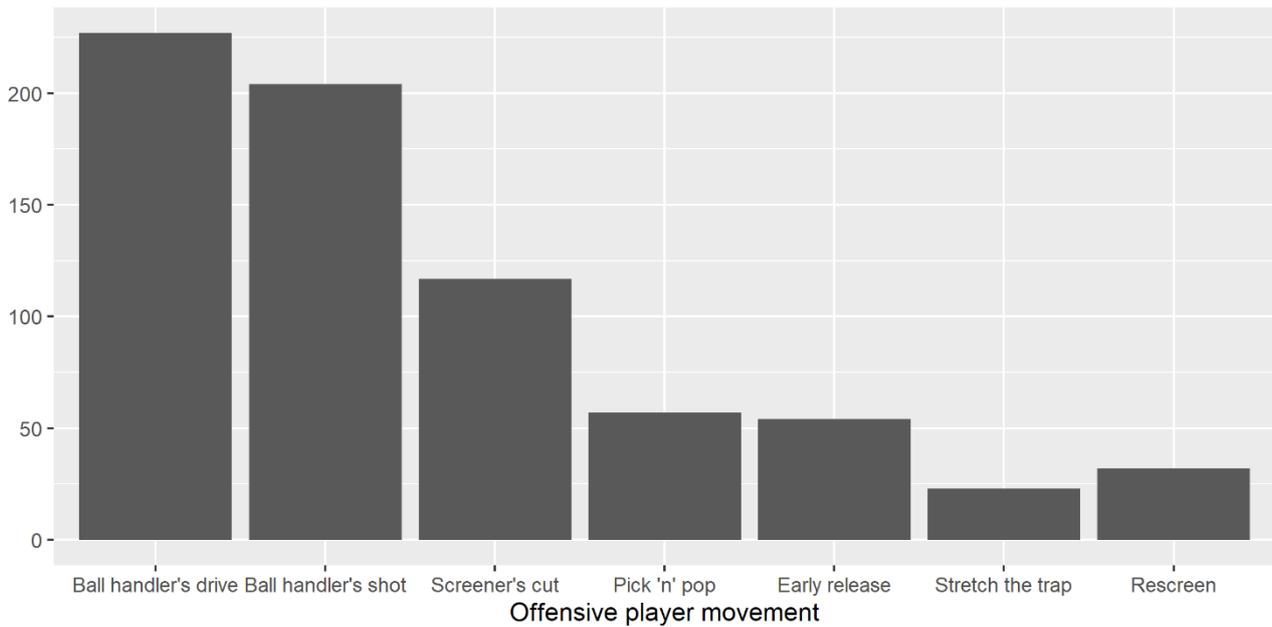


Figure 3. Frequency of occurrence of the pick and roll in terms of the offensive movements of the ball handler and the screener

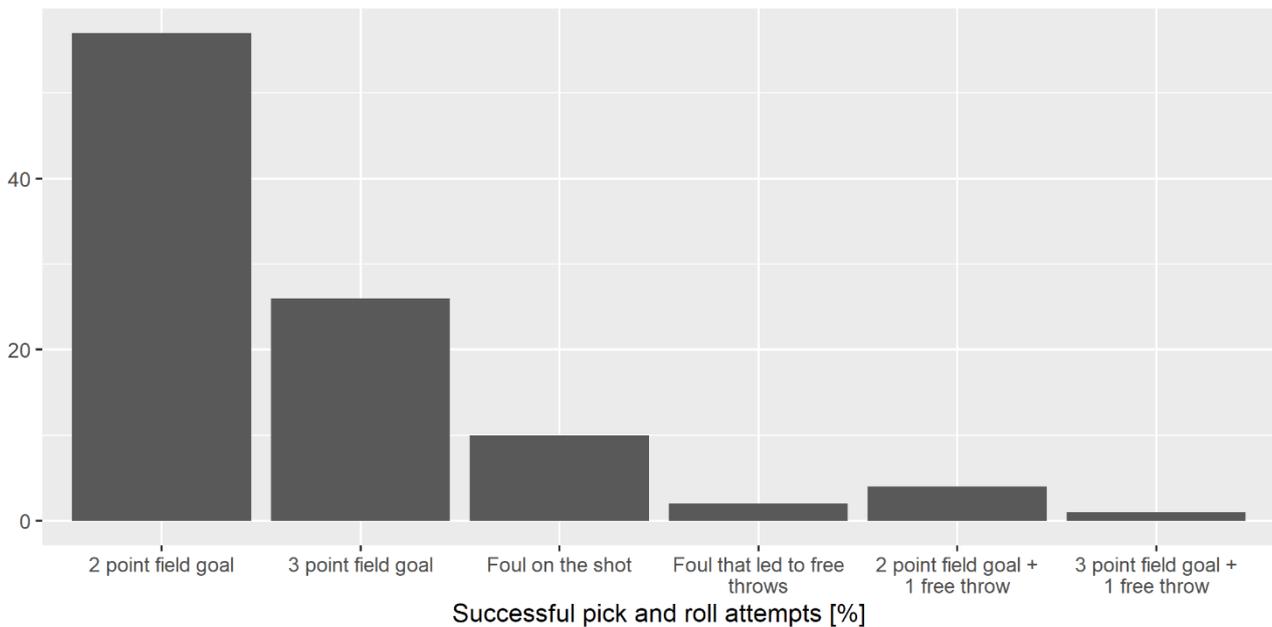


Figure 4. Frequency of occurrence of the successful pick and roll attempts

The majority of failed pick and rolls ended in a missed two-point field goal attempt ($n=141$, 39.4%). More than one hundred offenses resulted in a failed attempt to score a three-point shot ($n=115$, 32.1%). Finally, more than eighty offenses resulted in a

turnover of the attacking player, either the handler or the screener ($n=81$, 22.6%) while in the least failed pick and roll actions the defender blocked the attacker's attempt to score two points ($n=21$, 5.9%, Figure 5).

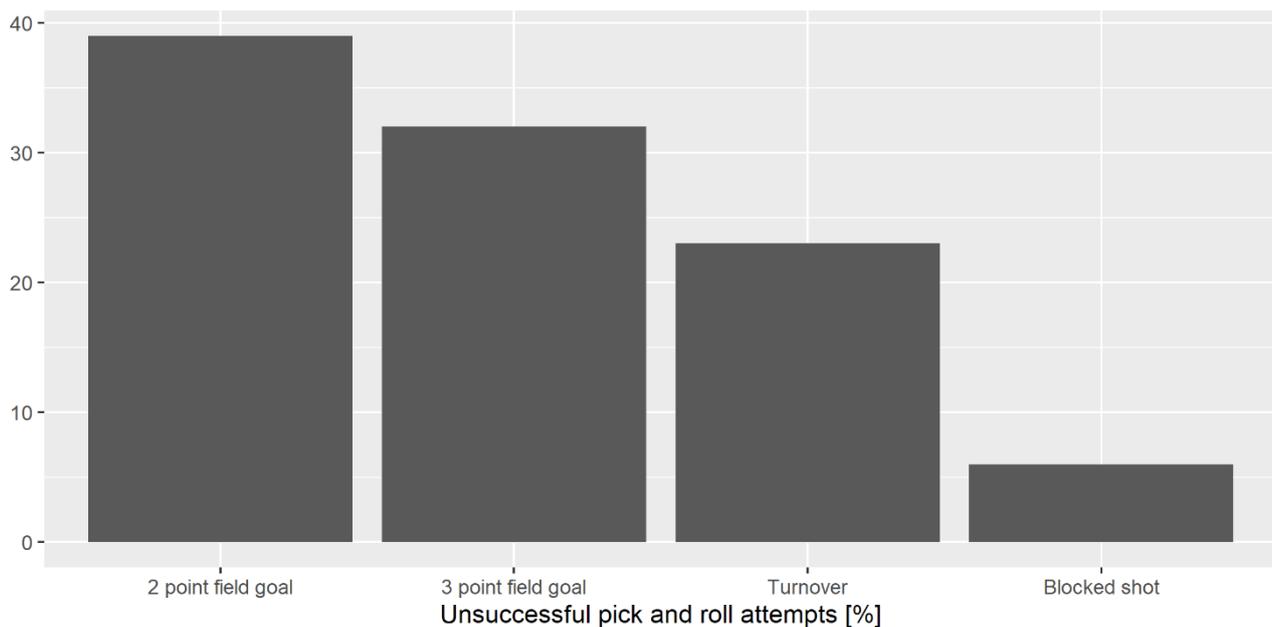


Figure 5. Frequency of occurrence of the unsuccessful pick and roll attempts

To determine if there are statistically significant differences in the use of pick and roll in the European Men's Championship between different variables, a cross-tabulation analysis with χ^2 (Chi-square test) was performed

The success or failure of the pick and roll did not appear to be affected by the quarter in which it occurred ($\chi^2=0.722$, $df=3$, $p=0.868$) or by the pair of players who created it ($\chi^2=2.103$, $df=2$, $p=0.349$).

At the same time, the outcome of the pick and roll seems to depend on whether it takes place near the basket or away from it ($\chi^2=75.173$, $df=2$, $p=0.000$). Carrying out the pick and roll away from the basket is more likely to lead to failure.

Discussion

Through this study, an attempt was made to give information and directions, regarding the pick and roll actions, to basketball coaches in order to better organize training and maximize the offensive performance of their teams. The analysis of the variables revealed important statistics concerning the category of men as well as the trends that prevails in modern basketball in Europe. The findings from the Men's category were compared with those in literature.

The successful pick and roll in the Men's category concerned 49.9% of them and respectively the failed 50.1%.

Regarding the execution time of the pick and roll in every five-minute span, it was observed that most of them were performed in the second five-minute span of each period (50.4%). This finding is inconsistent with the findings of Gómez et al. (2015) who found that most pick and rolls were performed in the first five minutes of each period (51.2%). One possible reason for this variance could be the likely increased concentration of the players in the last minutes of every period, enabling them to make more efficient offensive actions. Observing the execution time of pick and roll per ten minutes, it appeared that most ball screens were performed in the first ten minutes (26.3%), which is consistent with the results of Gómez et al. (2015) who found that 26.7% of pick and roll was performed during that period. The reason that most pick and roll are performed in the 1st period may be the increased concentration of the players at the beginning of the match.

Regarding the pairs of players who participated in the pick and roll, most of the pick and roll actions were performed by the guard as the ball handler and the center as the screener (63.4%), a finding agreed by Polykratis et al. (2010), Polykratis et al. (2009) as well as Koutsouridis et al. (2018). More specifically, in the first two researches, the percentage of pick and rolls performed with the guard as ball handler and the center as screener was 68%, while the percentage in the third study was lower (48%). The researchers point out that this pair was chosen because the guards are superior to the forwards in handling the ball, the explosiveness of their movements, and the ability to drive or shoot after the pick and roll. At the same

time, the centers, according to the researchers, are considered better screeners than the forwards because they show more explosiveness in the first step towards the basket after the screen as well as greater efficiency in scoring from a short distance and in the post up. It should also not be overlooked that when the pick and roll is performed by this pair, the tallest defender of the opposing team moves away from the inside area. This choice implies the creation of space in this area and because the guards as ball handlers make decisions faster, more opportunities for scoring are created, according to Koutsouridis et al. (2018).

Most of the players' aggressive moves after the pick and roll were performed by the handler, either with driving to the basket (31.8%) or with a shot (28.6%), a finding that Koutsouridis et al. (2018), Marmarinos et al. (2016), Polykratis et al. (2010), as well as Remmert & Chau (2018) agree with. The choice of the handler's penetration seems to increase the offensive efficiency of the team, because the ball goes from the perimeter to the inside area while the handler's shot is less effective. Instead, Remmert & Chau found that the handler's shot after pick and roll is a more successful tactic, with this move usually leading to a three-point shot. This finding highlights the growing importance of three-point shots in modern basketball.

The investigation of the outcome of the accurate pick and roll showed that the majority of them ended up with a successful two-point field goal (57%), a finding that Polykratis et al. (2009), Koutsouridis et al. (2018) as well as Marmarinos et al. (2016) agree with. Two-point field goals are more common in these studies, as in the present, possibly because lay-ups are included. Lay-up is a shot that is considered easier than the rest, because, in order for the player to be close to the basket, less force is required for performing the shot as well as less accuracy, offering great efficiency. In addition, the distance of two-point field goals is shorter than three-point field goals, increasing the effectiveness of this option.

The failed pick and roll in the Men's category ended up in their majority in a missed two-point field goals (39.4%), a fact that Koutsouridis et al. (2018), Marmarinos et al. (2016) agree with. Two-point field goals are more common in these studies, as in the present, possibly because lay-ups are included. Also, the distance of two-point field goals (like lay-ups) is shorter than three-point shots, which encourages the shooter to attempt a shot from this distance, hoping that it will be more effective.

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Conflict of interest

The authors declare that there is no conflict of interest.

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