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EFFECTIVENESS OF THE PICK AND ROLL OFFENSE AT THE 2017 EUROPEAN U'20 CHAMPIONSHIP

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Abstract:
Pick and roll actions have become one of the most frequently used offensive cooperations in youth basketball games. The purpose of this study was to evaluate the variables of 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 2017 European U'20 Championship and how these affect its effectiveness. The sample of the study was the sixteen games of the second round of the Championship, taking place in Heraklion, Greece. The instrument used for the analysis of the matches was the SportScout STA Version 3.2. Analysis with χ 2 (Chi-square) was used. A total of 658 pick and roll screens were found, of which 264 were successful (40.1%) and 394 (59.9%) failed. Furthermore, most pick and roll actions were performed in the first five-minute span of the first quarter of the games (n=103, 15.7%). The guard as the ball handler and the forward as the screener was the pair of players who participated in the majority of pick and rolls (n=296, 45%). Regarding the actions that took place after the screen, about 60% of the pick and rolls the ball handler chose to finish the action himself in 63.1% of the pick and rolls recorded either by driving to the basket (n=225, 34.2%) or with a shot (n=190, 28.9%). Most successful pick and rolls resulted in a successful two-point shot field goal (n=144, 54.5%) and most failed pick and rolls resulted in a failed two-point field goal attempt (n=200, 50.8%). The results of this research can provide information to coaches and players so they can organize better their training and maximize the performance of their team's offense.

Keywords: basketball, performance analysis, pick and roll, offensive efficiency, video analysis

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1. Introduction

Basketball is a team sport which constantly evolves at a rapid pace and each player should train hard so as not to be left behind other players (Kaslauskas, 2004). It requires all players to be involved continuously, both in defense and in offense. Also, their decision-making and collaboration leads in finding solutions and maximizing their performance (Karamousalidis, Galazoulas, Manousaridou, Bebetsos, Grammatikopoulou, & Alexaki, 2010).

In basketball matches, the aim of every team is to score more points than the opposing team while preventing them from scoring points through tactics and individual or team efforts (Marmarinos, Apostolidis, Kostopoulos, & Apostolidis, 2016). In basketball, coaches make offensive tactics based on the best chance of success against the opposing defense (Lamas, Santana, Heiner, Ugrinowitsch, & Fellingham, 2015). These offensive strategies have been characterized by the players' continuous motion, often leading to ball screens among them (Stavropoulos N., Stavropoulos D., 2020). Offensive plays are created with the purpose to disorganize the defense (Symeonidou, Karamousalidis, Stavropoulos, Ntikas, Zavaropoulos & Galazoulas, 2021). Screens 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, to create the conditions that will help their team to score (Angelou, Stavropoulos, Manou & Galazoulas, 2021). Pick and rolls are one of the most frequent tactical behaviors on offense in basketball. According to the research done by Remert & Chau (2018), teams prefer the use of ball screens in half-court offenses, which was greater than other offensive strategies. It has been observed by Lamas, De Rose, Santana, Rostaiser, Negretti and Ugrinowitch (2011), that teams who compete in high-level competitions, the most frequent screen they use in their offensive action to create space were ball screens, specifically pick and rolls. In basketball, analyzing matches through observation has been an important factor in gaining knowledge of the sport (Ortega, Cárdenas, Sainz de Baranda & Palao, 2006). It is important for coaches to know what differentiate winning and losing teams so they can make the right decisions to improve their team's performance (Csataljay, O'Donoghue, Hughes, & Dancs, 2009). That is the most important reason why the analysis of basketball performance is gradually gaining more importance (Koutsouridis, Karamousalidis, & Galazoulas, 2018). The analysis of performance indicators is common in the categories of men and not in younger age categories. In the researches of Ortega, Cárdenas, Sainz de Baranda & Palao (2006) and Ortega, Palao, Gómez, Lorenzo & Cárdenas (2007), the subjects were basketball players U16 years old. The variables measured were the offensive system used in every possession for the offense, how many points were scored, the duration of the possession, how many passes were made during it, how many players participated in every offensive possession, when the possession started and when it ended. Significant were found for these variables, but the effectiveness of the pick and roll was never measured. The effectiveness of the pick and roll has been investigated in various championships and

tournaments where men participate. In men's championships, it has been researched in all the high categories including European Championships (Angelou et al., 2021). Furthermore, the variables that the authors measured in the Men's 2017 European championship 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 (Angelou et al, 2021). It has been observed that no research has studied the effectiveness of the pick and roll in the European U'20 Championships. The purpose of this study was to evaluate specific parameters of the pick and roll offense in the 2017 European U'20 Championship and how these affect its effectiveness.

2. Methods

Sixteen matches from the second round of the European U'20 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) Greece 2) Israel 3) France 4) Spain 5) Serbia 6) Lithuania 7) Germany 8) Iceland 9) Turkey 10) Ukraine 11) Montenegro 12) Sweden 13) Italy 14) Slovenia 15) Czech Republic and 16) Latvia. 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.

2.1 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 manage videos quickly and easily from the games that interest him.

2.2 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 authors used videos from the official channel of FIBA on the YouTube platform. The matches were recorded during the 2017 European U'20 Championship, which took part in Heraklion, Greece.

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.

3. Results

A total of 658 pick and roll screens were found, of which 264 were successful and 394 failed. Regarding the execution time of the offenses in every five minutes, most pick and roll actions were performed in the first five-minute span of the first quarter of the games (n=103) and in the second five-minute span of the second quarter (n=95). More than 80 successful (while leading to a basket) pick and roll were achieved in the first five-minute span of the third quarter of the games (n=89) and in the first five-minute span of the second quarter (n=85). More than 70 pick and roll actions were recorded in the second five-minute spans of the second quarter (n=78), in the second five minutes of the fourth quarter (n=76) and in the first five-minute span of the fourth quarter (n=73). Figure 1 presented the frequencies of observed pick and rolls for every 5 minutes. The most successful pick and rolls were recorded in the first five minutes of the first quarter (n=45), the second five-minute span of the second quarter (n=44), and the first five minutes of the third quarter (n=40). More than 30 pick and rolls were found only in the second five-minute span of the fourth period (n=30).

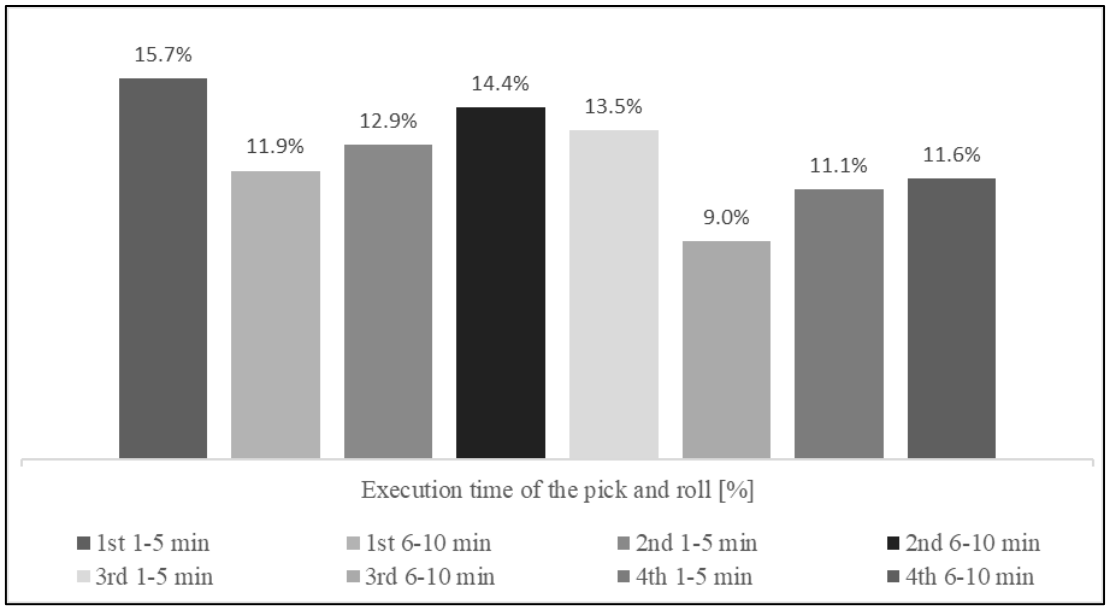

Figure 1: Frequency of occurrence of the pick and roll in terms of their execution time every five minutes

About the pairs of players who participated in this action, most of them were performed with the guard as the ball handler and the forward as the screener (n=296). The second most frequent pair of players who used the pick and roll was the one with the guard as the ball handler and the center as the screener (n=268). No other pair of players recorded a three-digit number of screens, with the pair that had the forward as a ball-handler and the center as a screener being the most frequent pair of the rest (n=79). Frequencies are presented in Figure 2. The pair of players with the most successful pick and roll was the guard and the forward (n=125) and followed that of the guard with the center (n=103). The only pair of players that had more than 20 successful pick and roll actions was the one with the forward as the ball handler and the center as the screener (n=29).

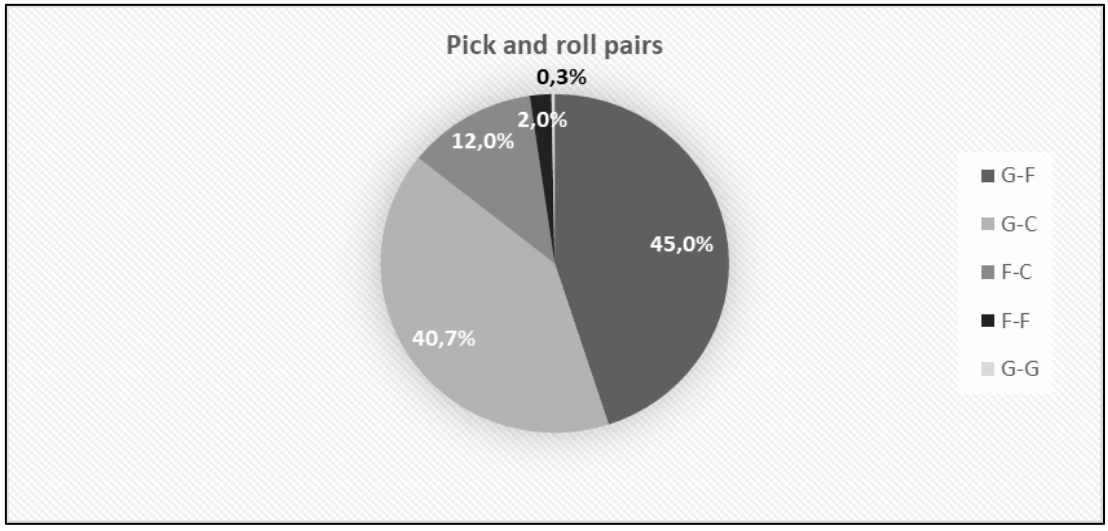

Figure 2: Frequency of occurrence of the pick and roll in terms of the pairs of players who participated in the pick and roll

In addition, the choices on offense, that were made by both the ball handler and the screener to take advantage of the pick and roll, were measured (Figure 3). In 63.1% of the recorded pick and roll actions the ball handler chose to complete the action himself either by driving to the basket (n=225) or with a shot (n=190). Moreover, the pick and roll actions that the screener utilized with an offensive move were over 30%. In most of the recorded actions, the ball handler decided to pass to the screener who moved to the basket after the pick and roll (n=109). No other ball screen action recorded a three-digit number of screens, with the pick and roll action where the handler passed to the screener who moved towards the perimeter, i.e., the three-pointer (n=39) or chose to use a rescreen by the screener so he can go to the opposite side he decided to go initially (n=35). The authors also recorded two more offensive actions after the pick and roll. Firstly, the ball handler passed to the screener who moved to the basket before the pick and roll was completed (early release, n=31). In the second recorded action, the defense chose to double team the ball handler after the pick and roll and he decided to complete the action himself or by passing to the screener (n=29). The most successful pick and rolls were observed when the ball handler chose either to drive to the basket (n=90) or shoot (n=60). It is noteworthy that in the pick and rolls where the handler selected to pass to the screener, in addition to the screener cutting in the basket after the pick and roll (n=47) the screener cutting in the basket before the pick and roll action was completed and passing to the screener moving to the perimeter, was very successful (n=20 and n=19 respectively).

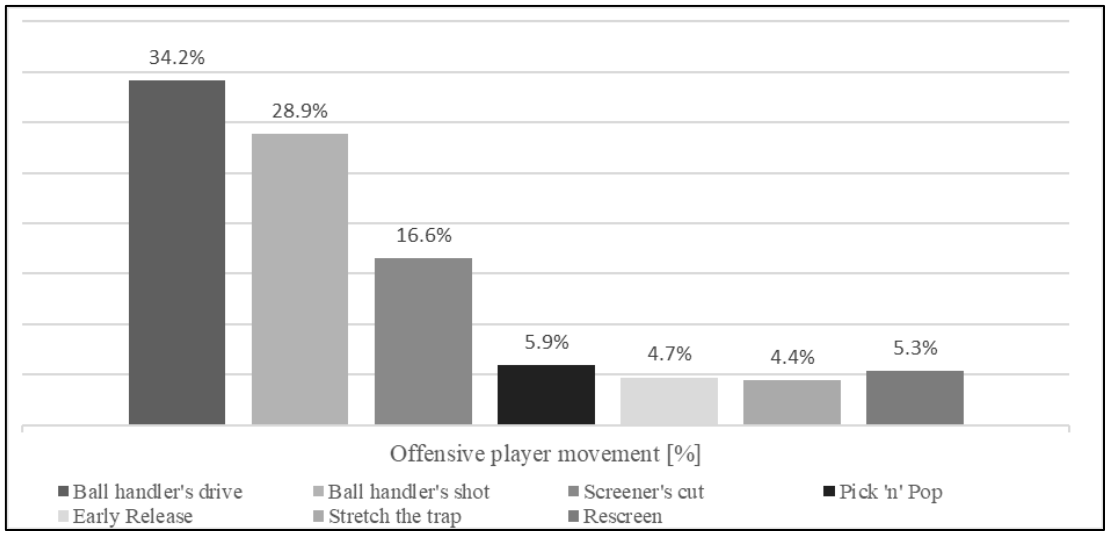

Figure 3: Frequency of occurrence of the pick and roll in terms of the offensive movements of the ball handler and the screener

Regarding the successful pick and rolls (Figure 4), most of them resulted in a successful two-point shot field goal (n=144). The pick and roll actions that resulted in a successful three-point shot were more than a quarter of all the successful field goals (n=74) while the offenses that resulted in only free shots were less than forty, most of which were fouled by the attacking player in his attempt to make a shot (n=24). The other free throws were attributed to the offensive player, 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=10). Lastly, the offenses in which the attacking player scored a two-point shot and performed one free throw were also important (n=10).

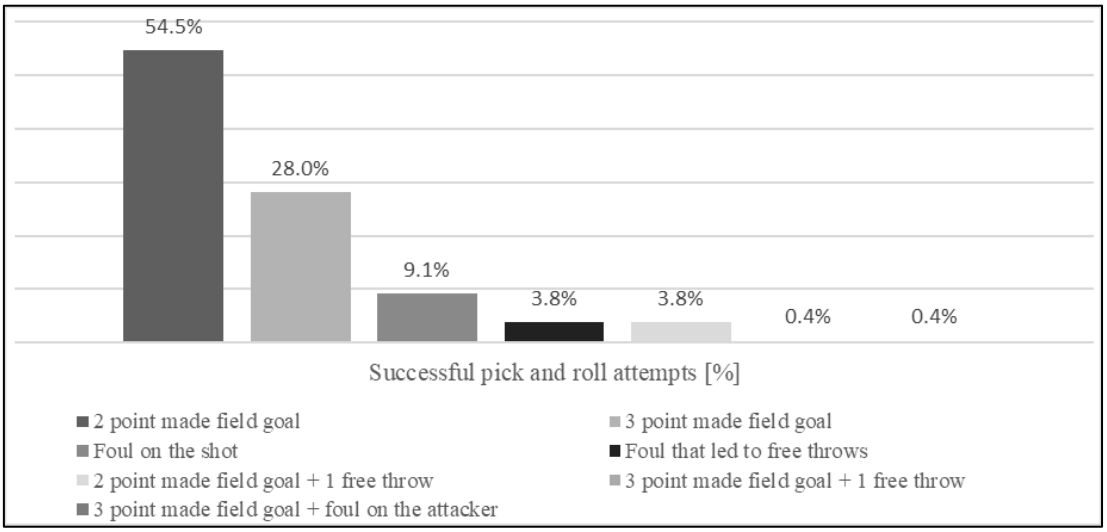

Figure 4: Frequency of occurrence of the successful pick and roll attempts

More than half of the failed pick and rolls ended in a missed two-point field goal attempt (n=200) (Figure 5). It is noteworthy that more than eighty offenses resulted in failed three-point field goal attempts or a turnover by the attacking player, either the ball handler or the screener, after or during the pick and roll (n=84 and n=83 respectively). Finally, the least failed action after or during the pick and roll was the defender blocking the attacker's attempt to score points (n=27).

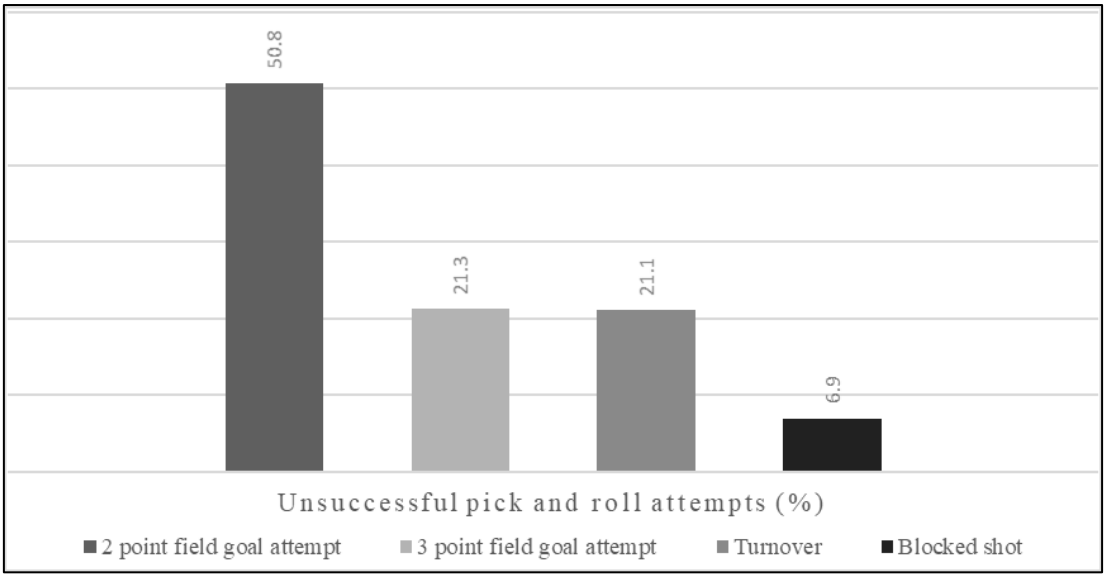

Figure 5: Frequency of occurrence of the unsuccessful pick and roll attempts

For the authors to determine if significant statistically differences were found in the use of the pick and roll in the European U'20 Championship, a cross-tabulation

analysis with χ^2 (Chi-square test) between different variables was performed. The success or failure of the pick and roll did not appear to be affected by the pair of players who participated (χ^2=0,996, df=2, p=0.608) or by the quarter in which it occurred (χ^2=1.914, df=3, p=0.590). Furthermore, the outcome of the ball screen action seems to depend on whether the player who finishes the action is the ball handler or the screener (χ^2=9.480, df=1, p=0.002). It seems that when the ballhandler is the player who finishes the action it is more likely to lead to success.

4. Discussion

The researchers attempted through this study to give information and directions, regarding the pick and roll actions to basketball coaches, players, and personnel (general managers) to organize better the training procedure and maximize the offensive performance of their teams. The analysis of the variables revealed statistics, deemed important, concerning the category of U'20 players as well as the trends that prevails in modern basketball in Europe. The findings from the U'20 category were compared with those in literature regarding the men's category.

The successful pick and rolls in the U'20 category concerned 40.1% of them and respectively the failed 59.9%. The smaller percent of the successful pick and roll offenses in this championship can be attributed to fewer years of basketball training, as specialization in this sport usually starts from the age of 14-15 years old. Also, other factors could be the lack of experience from knock out matches and the physiological characteristics of players who are not fully developed like those of men basketball players.

Regarding the execution time of the pick and roll in every five-minute span, most pick and rolls actions took place in the first five minutes of each quarter (53.2%), unlike the Men's European Championship, where most of the pick and roll actions were performed in the second five-minute span of each period (50.4%, Angelou et al. 2021), but are consistent 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%). The interpretation of these findings needs further investigation. Furthermore, most pick and rolls took place in the first quarter of each game (27.5 %). This finding is consistent with the results of Angelou et al. (2021) and Gómez et al. (2015) who found that most of the pick and roll actions were performed during that quarter (26.3% and 26.7% respectively). 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.

In regards to the pairs of players who participated in those ball screen actions, most of them were performed by the guard as the ball handler and the forward as the screener (45%), a finding that is inconsistent with the findings of Angelou et al (2021), Polykratis et al. (2010), Polykratis et al. (2009) as well as Koutsouridis et al. (2018), who found in their results for the Men's category that in the pick and roll actions the ball handler was the guard and the center was the screener. The differences in the U'20 Championship may be due to the different styles of play in recent years, players that were

characterized as centers operate as forwards. Of course, this case needs further investigation.

The player's offensive moves that they used the most after the pick and roll action were performed by the ball handler, either by driving to the basket or by shooting (34,2% and 28,9 respectively). There aren't studies that used pick and rolls in the U'20 category, but this finding agrees with those of Angelou et al. (2021), Koutsouridis et al. (2018), Marmarinos et al. (2016), as well as Polykratis et al. (2010) for the Men's category, The ball handler's drive to the basket seems to increase the efficiency of the team's offense, because the ball goes from the perimeter to the restricted area while the handler's shot is less effective. Instead, Remmert & Chau (2018) 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.

More than half of the successful pick and rolls ended with a successful two-point attempt (54.5%), a finding that Angelou et al. (2021), Polykratis et al. (2009), Koutsouridis et al. (2018) as well as Marmarinos et al. (2016) agree with. The studies mentioned above concern the Men's category. These types of successful shots are more common in these studies possibly because the authors included the lay-up shot. The lay-up shot is considered easier than the rest because this shot requires less force and accuracy from the player as he is closer to the basket, offering great efficiency. In addition, the distance of two-point field goals is shorter than three-point field goals, increasing the effectiveness of this shot.

Finally, most of the failed pick and rolls resulted in a failed two-point field goal attempt (50,8%), a fact that agrees with the studies of Angelou et al. (2021) Koutsouridis et al. (2018), Marmarinos et al. (2016), who studied pick and rolls in the Men's category. Two-point field goal attempts are more common in these studies, as in the present, possibly because lay-ups are included. This finding also needs further investigation. The results of this study provide more information and directions to basketball coaches and players in order to organize better their daily training and maximize the performance of their team's offense.

Conflict of Interest Statement

The authors declare that there is no conflict of interest.

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Spiros Dimitris Angelou, is currently a PhD candidate at the Department of Physical Education and Sports Science in the Aristotle University of Thessaloniki. This article's findings are part of his master's Thesis titled: «Pick and roll offense: Differences between the 2017 European Men's, U20 and U18 Championships».

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