SHOT DIFFERENCES BETWEEN PROFESSIONAL (ACB) AND AMATEUR (EBA) BASKETBALL TEAMS. MULTIFACTORIAL STUDY

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KEYWORDS: shot, multifactorial, differences, experts, inexperienced players.

ABSTRACT: The shot is the game action in which the rest of the players' actions culminate, allowing them to achieve the goal of the game, to score. In this action several factors intervene which condition its execution. The goal of this study was to analyze the shot, by executing a multifactorial study of the differences in this technical action between two competition levels, professional teams (experts) and amateur teams (inexperienced players). The shots taken during 60 games from two competition levels, the ACB league (30 games) and the EBA league (30 games) were studied. A total of 10212 shots were studied, of which 5161 corresponded to the ACB league (174±13.23) and 5051 corresponded to the EBA league (168±19.54). After an exploratory analysis, an inferential non-parametric analysis to assess whether the two samples of shots were equivalent was used (Mann-Whitney U).

Differences in free-throws between professional and amateur teams were only found in the distribution of the shots by quarter (U=7.5E+005, p=.025). The field goals taken in the two competitions are different with regard to the defensive pressure that the players receive before shooting (U=6.4E+006 p=.025), the shot value (U=7.1E+006, p=.010), and the action taken before the shot (U=6.6E+006, p=.000). The expert players (professionals) have a greater command of the game than the amateurs (inexperienced players), they maintain a higher defensive intensity from the beginning of the game, they are able to find shot positions in which the defensive pressure is less, they use more collective actions to look for better shot positions (passes), and they can shoot from greater distances.

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Introduction

Coaches need to know objectively what happens during games, by studying the factors that develop throughout the competition. The study of performance indicators in various competitions is one of the emerging research lines in team sports (Fierro, 2002; Sporis, Sango, Vucetic, & Maaina, 2006). Match analysis confirms that in sport, the way players react depends on their competition level, age, and sex (Sampaio, Ibáñez & Feu, 2004). Coaches need to be aware of these differences to be able to better adapt their coaching processes (Gómez, Lorenzo, Ortega, & Olmedilla, 2007).

The shot is the game action in which the rest of the players' actions culminate, as it is the only action that allows them to achieve the goal of the game, to score. In this action, several factors intervene which condition its execution. Researchers analyze more variables than those that are collected in the traditional statistics of a game, such as technique, defensive pressure, previous actions, player position, etc. (Ibáñez, García, Cañadas, Parejo, & Feu, 2008; Ortega, Cárdenas, Sainz de Baranda & Palao 2006).

Some studies analyze the shot from a multifactorial focus, with samples from different competition levels. Ibáñez, García, Feu, Parejo and Cañadas (2009) studied the American professional league (NBA), Ibáñez et al. (2008) analyzed the professional Spanish league (ACB), and Tsitskaris, Theoharopoulos, Galanis, and Nikopoulou (2002) analyzed the Greek professional league. The purpose of this study was to advance shot analysis by executing a multifactorial study of the differences in this technical action between two competition levels, professional teams (experts) and amateur teams (inexperienced players).

Method

This research employed a qualitative and descriptive methodology. The shots taken in two competition levels, professional (ACB league) and amateur (EBA league), were studied. A total of 60 games were studied, 30 from each league. To analyze each shot, the variables and categories employed in similar studies (Ibáñez et al., 2009; Ibáñez et al., 2008) were utilized: i) period, ii) quarter, iii) technique, iv) defensive pressure, v) zone on the court, vi) efficacy, vii) position of the player that shoots, and viii) previous action taken.

Sample. A total of 10212 shots were recorded, of which 5161 corresponded to the ACB league (174 ± 13.23) and 5051 corresponded to the EBA league (168 ± 19.54). The distribution of the shots is demonstrated in table 1.

Data analysis. The statistical analysis that was carried out utilized the SPSS 17.0 statistical packet. First, an exploratory analysis of the data was done. Next, a non-parametric inferential analysis was done to assess whether the two samples of shots were equivalent (Mann-Whitney U). Finally, contingency tables and residual adjusted standardized values were used to interpret the differences between the two competitions ($>|1.96|$).

Results

The peculiar characteristics of shots means that an independent study of free throws (1 point) and field goals (2 and 3 points) is necessary.

Free Throws. The only differences found in free throws between professional and amateur teams are in their distribution by quarter ($U=7.5E+005$, $p=.025$). In both leagues, there is an increase in free throws in

	1 POINT		2 POINTS		3 POINTS		**TOTAL**
	Frequency	%	Frequency	%	Frequency	%	
ACB	1357	26.29	2603	50.44	1201	23.27	5161
EBA	1233	24.41	2716	53.77	1102	21.82	5051
TOTAL	2590	25.36	5319	52.09	2303	22.55	10212

Table 1. Distribution of the shots with regard to point value.

each quarter (1st, 2nd, 3rd, 4th) as the game goes on (ACB: 22.7%; 20.5%; 25.4%; 33.5%; EBA: 16.5%; 22.0%; 25.1%; 35.8%). The RAS value (2.7) makes clear that there is a greater proportion of free throws during the first quarter in the professional league.

Field Goals. The results from the Mann-Whitney U statistic for the field goal variables that were analyzed allow us to reject the hypothesis of equality of means and conclude that the shots taken in the two competitions are different with regard to defensive pressure (U=6.4E+006 p=.025), shot value (U=7.1E+006, p=.010), and previous action (U=6.6E+006, p=.000).

The values of the *RAS* from the contingency tables indicate that professional teams behave differently from amateur teams when confronted with defensive pressure when taking a shot. The proportion of shots without defensive pressure (*RAS*=8.5) or with low defensive pressure (*RAS*=2.1) is higher than expected in the ACB league and lower in the EBA league. Likewise, the proportion of shots with high defensive pressure is higher in the professional league (*RAS*=4.6). Finally, the professional (ACB) teams execute a lower proportion of shots with submaximal defensive pressure (*RAS*=-11.8).

Field goals have a different value depending on the distance from which they are taken. Expert players take a statistically significant lower proportion of 2-point shots (*RAS*=-2.6), which are closer to the basket, and a higher proportion of 3-point shots (*RAS*=2.6), which are farther from the basket, than the inexperienced players.

Finally, differences were also found in the actions that precede a shot. Professional players take a lower proportion of shots preceded by a dribble (*RAS*=-6.9) than amateur players but more that are preceded by a pass (*RAS*=6.7) or other unconventional action (*RAS*=2.0).

There were no statistically significant differences by expert and inexperienced players for the rest of the analyzed variables.

Discussion

The results clearly demonstrate different behavior in shots taken by professional and amateur players. In spite of there being no differences in the average shots per game, there is a greater dispersion in the amateur league, which clearly shows less equilibrium and command of the game among inexperienced players.

Defensive intensity, demonstrated through the fouls on the player that shoots and provoking free throws, increases

throughout the game in all of the analyzed sample, reaching the maximum number of shots during the fourth quarter. However, there are significant differences between the experts and the inexperienced players in the first quarter. Expert players start the game with a higher level of defensive concentration than the inexperienced players and they maintain it during the first three quarters.

Professional players shoot with less defensive pressure than the amateurs. They are better able to select the moment and the optimal place to shoot with less opposition. Expert players are quicker in perceiving what happens during the game as they have better selective attention and offensive prediction (Kioumourtzoglou, Kourtessis, Michalopoulou & Derri, 1998). Further, they have better tactical discipline and know how to more adequately select their shots (Trininic, Dizdar, & Luksic, 2002).

Expert players take more 3-point shots, though this does not cause a loss in efficacy. These players have a better command of the specific technical skills of the game than the inexperienced players (Kioumourtzoglou, Derri, Tzetzis, & Theodorakis, 1998), and the shot from a longer distance is a specific skill of the basketball player. Fierro (2002) found a significant correlation between 3-point shots and assists in the NBA, in which expert players participate.

Professional players have a better command of the game and, therefore, the action that precedes the shot at this level of competition is the pass. Passes and assists (passes that help attain a basket) reflect better team work, which allows a team to put itself in better situations and shot positions (Sporis et al. 2002). Sampaio et al. (2003) demonstrated that junior teams (inexperienced players) play with fewer assists than senior teams (experts). Inexperienced players, as they have less command of the game, resort to individual previous actions, such as dribbling. Shooting after dribbling is a slower action, and therefore, amateur players are also subjected to greater defensive pressure before taking a shot (submaximal).

Conclusions

The results make clear that shot characteristics are different with regard to competition level of the players. Coaches should know the specific characteristics of their competition to adequately prepare their players. Likewise, the knowledge of these differences should help orientate the formational process of the inexperienced players in order to facilitate their transition to peak performance.

Professional players have a greater command of the game than amateur players, maintain a higher defensive intensity from the beginningof the game, find shot positions in which the defensive pressure is less, utilize more collective actions to better look for shot positions (passes), and shoot from greater distances.

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