Analysis of the offensive teamwork intensity in elite female basketball

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ABSTRACT

Bazanov, B., & Rannama, I. (2015). Analysis of the offensive teamwork intensity in elite female basketball. *J. Hum. Sport Exerc., 10*(1), pp.47-51. The aim of this study was to determine the offensive teamwork intensity at a high level of women's basketball performance. Under observation for this research were quarter finalists of the European Women´s Basketball Championship held in 2011. The data were gathered from 951 ball possessions of 7 recorded games. Our earlier research (Bazanov, B et al. 2005) has helped to work out the basics of the analytical system of the teamwork aspect. The analysing system of the competitive activity of the game, which we have worked out, enables to determine the structure and intensity of the teamwork, and to find interesting models of game activity from the data. The results of this research showed that the average teamwork intensity index among quarter finalists of the European Women´s Basketball Championship in 2011 was 0,72 (SD+/- 0,24). Based on the results of working through the statistical data (T-test, F-test), it was found that the teamwork intensity index of successful offenses (0,76) was statistically significantly different (p<0,01) from non successful (0,68). **Key words**: OFFENSIVE TEAM ACTIVITY, SUCCESSFUL AND NON-SUCCESSFUL POSSESSONS, TIME OF POSSESSION.

INTRODUCTION

During the game there are changes in the structure of the game activity, which are caused by different reasons. For instance, it may depend on the tempo, the defensive formation of the opposite team or on the variety of use offensive models amongst others. It is necessary to analyze this information in order to arrange the training process more effectively. Karipidis et al. (2010) have studied the coordinated movements before the final effort, as well as the effectiveness of the offenses after the outside game, in European basketball. The results revealed that: 8 out of 10 of the realized offenses led up to a control offense 5 to 5, while the outside game was dominant, taking up 65% of the executed offenses. In addition, 4 out of 10 outside game offenses were realized with a screen, while 6 out of 10 without a screen. The teams had higher two and three point shots when performing after a screen. The most popular way of co-operation with a screen was pick and roll, while the most frequent kind of offense without a screen was the 1 to 1. Although the offenses were organized far from the basket, the centres had higher values on the statistical indexes than the rest of the players. Polykratis et al. (2010) have analysed the alterations of Pick n' Roll effectiveness between the national team of Greece and its opponents during the Mundobasket 2006 in Japan. The results showed statistically significant differences between the Greek and the other National Teams according to the use of Pick n' Roll move in the offensive set plays and also according the offence efficacy and offence productivity. The Correlation analysis revealed extremely high interrelation between offence efficacy and shot area ($p = -0,209(**)$, $a=0,01$), and as far as offence productivity is concerned extremely high interrelation revealed first of all with the final shot player and secondly with the shot area ($p = -0,2877(**)$, $a=0,01$). According to the Cluster analysis the results revealed that as far as both offence efficacy and offence productivity are concerned the maximum similarity is modulating in relation with the Pick n' Roll form. Garcia et al. (2013) set a target to identify basketball game performance indicators which best discriminate winners and losers in the regular season and playoffs. The sample used was composed by 323 games of ACB Spanish Basketball League from the regular season (n=306) and from the playoffs (n=17). The results indicated that winning and losing teams played different in regular season and playoff games. Overall, the regular season games were dominated by the importance of assists, showing the importance of teamwork during this phase. On the contrary, the playoff games were dominated by the importance of effective defensive rebounding. As a consequence of a slower game pace and a higher competitive importance of the game itself, this might reduce successful field-goals and free throws. Defensive rebounds´ importance increases to secure these unsuccessful shots.

Our earlier researches has helped to work out the basics of the analytical system of the teamwork aspect which enables to determine the structure and intensity of the offensive team activity (Bazanov et al. 2006; 2005), to find out the factors which cause the turnovers of the team and conditions to avoid them (Bazanov, & Võhandu, 2009), and to discover other interesting game models from the data. For example, we have found, that among non-professional men's basketball teams, ball possessions with higher "teamwork intensity" were more successful (Bazanov, 2007). Based on this knowledge, the aim of the current study was to determine the offensive "teamwork intensity" at a high level of women's basketball performance.

METHODS

Under observation for this research were quarter finalists of the European Women´s Basketball Championship held in 2011 (Russia, Turkey, Czech Republic, France, Croatia, Montenegro and Latvia). The data were gathered from 951 ball possessions of 7 recorded "play-off" games. Further editing of the recorded games was done using the DartTrainer Basic version 2.5.3 program (Dartfish 2001) Intensity index was determined using the following formula: Index = (D + P + Scr on + scare off + S) /t, where: D -

dribbles; P - basses; Scr on - screens on the ball; scare off - screens off the ball; S - shot; t - time of ball possession in the offensive zone. The time of ball possession in offensive zone starts from the moment when the player in the offensive zone takes hold of the ball and ends with the moment the ball leaves the hands of the shooter or with the moment when the opposite team possesses the ball. Time is stopped in rebound and inbound situations. The time duration was measured with 0,04 Sec accuracy. The data were statistically edited. The average of the data gathered and standard deviation (the total sum of elements in the offensive zone, ball possession time in the offensive zone, intensity index, turnovers/possessions, points/possessions) was determined. The reliability of the differences in indicators was tested (F-test, T-test). Team ball possessions were grouped in two different ways: according to result of the possession: successful (1-3 points) or non-successful (0 points) and winning or losing team ball possessions.

RESULTS

The results of this research showed that the average teamwork intensity index among quarter finalists of the European Women´s Basketball Championship in 2011 was 0,72 (+/- 0,24). The mean of ball possession time in the offensive zone was 11,56 (+/- 6,52) and the average sum of used elements in offensive zone 7,73. (+/- 4,22)

Comparison of successful and non-successful possessions
To determine whether there are important differences between the duration of successful and non-successful possessions, the total number of elements and the central indicators of the intensity index, T-test and F-test were done.

Table 1. Indicators of successful and non-successful possessions

	Successful			Non-successful		
	Time (s)	Elements	Intesity	Time (s)	Elements	Intensity
Mean	11,18	7,71	0,76	11,82	7,71	0,68
SD	6,52	4,23	0,24	6,34	4,18	0,22
F-test	0,177239	0,622761	**0,007481393			
T-test	*0,049286	0,49928	**1, 21283E-06			

N = 951; * - p < 0.05 ** - p < 0.01

The indicators of analyzing offenses are given in the table 1. From the given table, we can see that the average ball possession time in the offensive zone of successful offenses (t =11, 18 and the intensity index in the offensive zone (0,76) are statistically significantly different from the non-successful ones (accordingly t =11, 82; index - 0,68). F-test results show, that time and element dispersions have no significant difference, though at the same time the intensity index does.

Comparison of winning and losing teams
Data in Table 2 shows, that the majority of selected indicators of winning and losing teams is reliably different. Winners (12,09 ± 6,55) compared to the losers (11,03 ± 6,42) possessed the ball in the offensive zone reliably (p<0,01) longer, using more elements (accordingly 8,08 ± 4,36; 7,34 ± 4,05 p<0,01). At the same time the winning teams had a lower average number of turnovers (0,15 ±0, 35, p<0,05) and scored more (1,04 ±1, 14, p<0,01) than losing teams (accordingly turnovers/possessions 0,21 ± 0,41;

points/possessions 0,82 ± 1,08). However, it should be noted that among quarter finalists of the European Women´s Basketball Championship there was no reliable difference in the offensive teamwork intensity.

Table 2. Indicators of winning and losing teams

	Winning teams		Losing teams			
Indicators	Mean	SD	Mean	SD	F-TEST	T-TEST
Time (s)	12,09	6,55	11,04	6,43	0,67528	*0,01441
Elements	8,08	4,36	7,35	4,05	0,11156	0,111562
Intensity index	0,71	0,22	0,72	0,25	*0,012071	0,387462
Turnovers/possessions	0,15	0,35	0,21	0,41	**0,003576	*0,015915
Points/possessions	1,04	1,14	0,82	1,08	0,32159	**0,002396

N = 951; *p<0.05 **p<0.01

DISCUSSION

Observation of competitive activity at a high level of basketball performance convince, that the modern game is becoming more dynamic. The results of our earlier research (Bazanov, 2007, 69) showed, that among non professional men's basketball teams, offenses with higher teamwork intensity are more effective. In the study we found, that the teamwork intensity index of successful offenses was equal to 0,86 on average and the same indicator of non-successful ones was reliably (p<0,001) lower and equal to 0,78. The results of the current study confirm our hypothesis, that ball possessions to higher offensive teamwork intensity value are more effective also at a high level of women's basketball performance.

The offense efficiency coefficient (OEC) is considered to be one of the main indicators in basketball. Usually the average OEC is equal to 1,0 (Oliver, 2004). Therefore the target of the offense is to achieve OEC higher than 1,0 and the aim of defense is to keep opponent's OEC below 1,0. Thus the efficiency of winning team's offense (1,04 ±1, 14) can be estimated as high and respectively losing team's efficiency (0,82 ±1, 08) as low.
Besides to the scoring avoidance of turnovers is almost as important from the viewpoint of the final score. Especially important it is for the teams on the inferior level, e.g. youth teams (Oliver, 2004). Even at the higher levels of the basketball it is hard to underestimate that component. Therefore the corresponding coefficient of winning and losing teams was compared. In the similar way of determining the offense efficiency the team's level of ball handling is calculated dividing the number of turnovers by the number of possessions. From the results that it occurred in comparison to losing teams' group (0,21 ± 0,41) „winners" had a reliably better indicator (0,15 ± 0,35) here as well.

CONCLUSIONS

Based on the results of working through the statistical data (T-test, F-test), it was found that at high level of women's basketball performance the teamwork intensity index of successful offenses was statistically significantly higher than non-successful ones. The comparison of the offensive indicators of winning and losing teams showed, that having an equal teamwork intensity index, the winners are more resultive with lower turnover indicator.

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