Denis Čaušević[1]

GAME-RELATED STATISTICS THAT DISCRIMINATE WINNING AND LOSING TEAMS FROM THE WORLD CHAMPIONSHIPS IN SPAIN IN 2014

[1]*Faculty of Physical Education and Sport, University East Sarajevo, Bosnia and Herzegovina*

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Abstract
Basketball is one of the most popular sports today, and therefore the sport that is the subject of much research. The aim of this study was to determine on the basis of which basketball performance indicators can be discriminate winners from losers at the finals of big events. The sample represented 76 matches of world championships in Spain in 2014, of which the official statistical parameters downloaded from FIBA. The results of discriminative analysis showed that the winners can be discriminate from defeated statistic significantly in defensive rebounds (SC = .68), successful 3-points (SC = .49), unsuccessful 2-points (SC = -. 41), biggest lead (SC = .37) and offensive rebounds (SC = .35). The results could be useful to trainers in the preparation and to prepare training programs for this kind of competition.

Key words: **performance, statistical analysis, situational efficiency, standard and derived parameters**

Introduction

Basketball has become one of the most popular sports in the world due to the dynamism of the game, which is adorned. It is basketball, sport that is the most analyzed through rotational analysis or performance analysis (Lorenzo, Gómez, Ortega, Ibáñez, & Sampaio, 2010). Performance analysis in ball team sports such as basketball is a fundamental tool for coaches, allowing them to have valid and reliable information concerning their team and opponents. (S. J. Ibáñez, García, Feu, Lorenzo, & Sampaio, 2009). In order to monitor events at the basketball game FIBA (Federation International Basketball Association) has standardized the thirteen indicators of situational effectiveness monitored at every official match on the basis of which it is possible to calculate the different derived parameters (Sindak, 2012). These indicators were the subject of many studies related to the difference between the winners and losers in basketball games (Gómez, Lorenzo, Sampaio, José Ibáñez, & Ortega, 2008; S. Ibáñez, Sampaio, Sáenz-López, Giménez, & Janeira, 2003; S. J. Ibáñez, García, et al., 2009; Lorenzo et al., 2010; Pojskić, Šeparović, & Užičanin, 2009; Sampaio & Janeira, 2003; Sindik, Jukić, & Adžija, 2012). This research has led to easier understanding of basketball games as well as team achievements through the analysis of statistical parameters, which can lead to improvement of technical and tactical elements. Analyzing the research that dealt with differences winners and losers teams, it is evident that the parameters that could affect the final resultst: 2-points field goals (García, Ibáñez, De Santos, Leite, & Sampaio, 2013; García, Ibáñez, Gómez, & Sampaio, 2014; Gómez et al., 2008; Ibanez et al., 2008; S. Ibáñez et al., 2003; Pojskić et al., 2009), 3-points field goals (García, Ibáñez, De Santos, et al., 2013; Gómez et al., 2008; Ibanez et al., 2008; Sampaio & Janeira, 2003), free throws (Gómez et al., 2008; Ibanez et al., 2008; S. Ibáñez et al., 2003) and assists (García, Ibáñez, De Santos, et al., 2013; García et al., 2014; Ibanez et al., 2008). Taking into account these circumstances, and very few studies conducted on large raced (World, European and Olympic championships) that characterizes a large number of games in a short period of time, we decided to explore the World Basketball Championship in Spain in 2014. Because of the above, the aim of this study was to determine on the basis of which basketball performance indicators can be discriminate winners from losers at the finals of big events.

Methods

Sample

The sample represented 76 matches (152 different samples) World Basketball Championship Spain 2014, whose official statistic parameters downloaded from the FIBA (http://www.fiba.com/spain2014).

Variables

A total of twenty-two variables, and the basic criterion was the victory-defeat. The game-related statistics included free-throws, 2 and 3 point field goals (both successful and unsuccessful), offensive rebounds, defensive rebounds, assists, steals, turnovers, received and committed fouls and blocks received and committed (García, Ibáñez, De Santos, et al., 2013; García et al., 2014; Navarro, Lorenzo, Gómez, & Sampaio, 2009). Coefficient of agreement kappa > .92 (García, Ibáñez, De Santos, et al., 2013; García et al., 2014; S. J. Ibáñez, Feu, García, Parejo, & Cañadas, 2009; Sampaio, Drinkwater, & Leite, 2010). Additional variables that were used are: points from counterattack, biggest lead, the points from the paint, the points from the bench, the points from turnovers, the points of the second chance, the largest series and the number of players who played.

Statistical analysis

First, an exploratory analysis of the data with means (M) and standard deviation (SD) was carried out. All statistical parameters are normalized to 100 ball possession in order to access to the analysis of the difference between the teams. For example, in the event that one team put 42 points out of 65 ball possession, their performance is significantly statistically different (64.6%) of the performance of the team that put 42 points out of 90 ball possession (46.6%). Ball possession is calculated as recommended by the author (García, Ibáñez, Cañadas, & Antúnez, 2013; García, Ibáñez, De Santos, et al., 2013; S. J. Ibáñez, García, et al., 2009; Oliver, 2004) by the following equation:

$$\text{Ball possession} = (\text{field-goals attempted}) - (\text{offensive rebounds}) + (\text{turnovers}) - 0.4 * (\text{free-throws attempted})$$

Discriminant analysis was made with the aim of determining the parameters which is most easily differentiate the winners and losers on the World Basketball Championship in Spain in 2014. The coefficients of the structure (SC) are used to show the most important difference between winners and losers. Values above | .30 | are interpreted as significant for this analysis (García et al., 2014). Data processing is done in the statistical package SPSS 21st.

Results

Results of arithmetic means and standard deviations of standard indicators basketball games are presented in Table 1. Discriminant analysis showed a statistically significant function ($p \leq .01$) with a canonical correlation of .81 ($\Lambda = .34$) and the classification results of 86.8%. The coefficients of the structure (SC) showed the biggest gaps in defensive rebounds (.68), affected shots for 3 points (.49), misplaced shots for two points (-.41), evening leadership (.37) and offensive rebounding (. 35).

Table 1. The arithmetic mean, standard deviation and coefficient of structure

World Basketball Championship in Spain in 2014					
	Winners		Defeated		
	Mean	Std. Deviation	Mean	Std. Deviation	SC
Successful 2-points	39.81	9.26	30.93	6.74	.20
Unsuccessful 2-points	32.08	8.75	36.09	10.24	-.41*
Successful 3-points	14.80	4.38	11.14	4.67	.49*
Unsuccessful 3-points	23.92	7.31	25.11	7.22	-.28
Successful 1-points	26.17	12.66	21.12	12.49	-.22
Unsuccessful 1-points	10.71	7.02	8.14	4.94	-.11
Offensive Rebounds	19.72	7.29	16.74	7.12	.35*
Defensive Rebounds	48.68	9.95	38.00	8.70	.68*
Assists	30.30	9.12	20.89	6.61	-.12
Turnover	23.86	6.76	25.25	7.79	-.10
Steals	13.07	6.28	10.24	4.45	.25
Blocks committed	5.53	4.19	4.14	3.58	.06
Blocks received	4.09	3.56	5.55	4.19	.01
Fauls committed	35.54	9.09	36.33	7.69	-.08
Fouls received	36.33	7.62	35.58	9.09	-.01
Fast Break Points	20.08	13.26	11.42	6.87	-.29
Biggest Lead	37.17	19.15	7.93	7.31	.37*
Points in the Paint	66.33	17.44	48.36	15.79	.13
Points From The Bench	57.20	20.51	42.74	18.95	-.12
Points From Turnover	31.42	15.02	20.84	8.31	.26
Second Chance Points	20.28	8.48	15.57	8.13	-.02
Biggest Scoring Run	20.83	5.85	13.68	5.15	.24
Player plaid	11.16	1.04	11.01	.93	.08
Wilks Lambda					.34ǂ
Eigenvalue					1.91
Canonical Correlation					.81

*SC ≥ |.30|; p ≤ .001

Discussion

The aim of this study was to determine on the basis of which basketball performance indicators can be discriminate winners from losers at the finals of major competitions. World Basketball Championship has a unique system of competition, that is a large number of matches in a small period of time, that from the players requires a high level of physical, technical, tactical and psychological preparation. When analyzing the match at the last World Basketball Championship 2014 Spain it is possible to identify a set of indicators that distinguish winners from the losers (defensive rebounds, successful shots for three points, unsuccessful shots for two points, biggest lead, and offensive rebounds).

Team winners are distinguished by a larger number of defensive rebounds (García, Ibáñez, De Santos, et al., 2013; García et al., 2014; Gómez et al., 2008). Defensive rebounds are one of the key elements of basketball games because not only contribute to the transition from defense to offense, but with them the opponent can be limited to the possibility of achieving points. In addition, defensive rebounds associated with better defense capabilities (García, Ibáñez, De Santos, et al., 2013). With good defense opponents are forced to worse shot, which can ultimately lead to a miss shot and defense rebound. Defensive rebounds also have an indirect impact on the rhythm of the game, more rebounds means more chances for points from counter attacks, which usually occurs after defensive rebounds or steals (S. J. Ibáñez, García, et al., 2009). All this points to the fact that the coaches should pay attention to this aspect of the game, and on the field try to provide a good defensive rebound. Also it is not only important to ensure a good defensive rebound but try to catch the ball after missed shots by your own team, achieve offensive rebound. By winning offensive rebounds teams can afford a larger number of the ball, and thus more likely to achieve points.

Missed shots for two points show that this parameter is one of the key when it comes to the ultimate outcome of the game. It is a team that have a higher shooting percentage for two points or the team that reduce the number of failures for two points in the end wins the game. Reserch (García, Ibáñez, De Santos, et al., 2013) of the difference between winners and losers in league matches in the Spanish league season 2007/2008 showed that the success of two point shot definitely plays a significant role in the final outcome of the match. The defensive and offensive rebounds allow a greater number of possessions, while the successful 2-points field-goals is indicative of the weakness of the loser centres to defend against the winner centres (Escalante, Saavedra, & García-Hermoso, 2010).

Several scientific papers emphasized the significance of the three point shot, as one of the main characteristics of the winning teams (García, Ibáñez, De Santos, et al., 2013; Gómez et al., 2008; S. J. Ibáñez, García, et al., 2009). In recent years, it is noticeable that the three-point shot plays a major role in victory or defeat, but not only that but also the dynamics of the game, where a high percentage of three point shot creates a lot of room for tall players under the basket. There has been an increasing number of outside shot specialists, especially the three-point shooters. Autors (S. J. Ibáñez, García, et al., 2009) state that the positive series of for example three wins in a row, three-point shot indicates as a key factor. These facts point to the possibility that in the future the three-point line extended by a few centimeters, which could require further improvement of the techniques and skills of basketball players (Pluta, Andrzejewski, & Lira, 2014).

And at the end a parameter that indicates a statistically significant difference in the treated problem is the biggest lead. The highest leadership means the maximum difference made during the game by one team. The fact that the acquisition of a larger advantage over the opponent, teams have more space for their mistakes, peaceful attack and higher chance of winning.

Conclusion

Results of this study showed that the winning teams play aggressive basketball, especially under the baskets (offensive and defensive rebounds). To achieve victory, you also need to reduce the number of missed shots for two points, and with a good shot for three points to try to make it bigger difference. Good decisions and good quality selections a shot with quality leap it is possible to make a step forward and distinguish wining from the defeated team. As a limiting factor in this study is the fact that the analysis of statistical parameters is not fully sufficient to understand all the facts that are happening in the match. In future studies, it would be desirable to include other factors as are: the audience, the length of the ball, the duration of the attack, any concrete analysis of players and many others.

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Correspondence to:
Denis Čaušević, MA
Faculty of Sport and Physical Education University of Sarajevo
Bosnia and Herzegovina
E-mail: causevic.denis@hotmail.com