PROFILE OF THE INTENSITY OF EFFORT OF MOVES AND TIMING IN PROFESSIONAL BASKETBALL GAMES

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ABSTRACT

In basketball special attention should be paid to the athletes' efforts during the games. The present work investigates games situations as frequency of attack and the timing of execution of the moves of defense, timeouts practiced by high level teams, in 18 games of National League of Male Basktetball – 1999/2000. From observa - tional direct delineation, data were collected in standardized instru - ment of register, stored in databanks and processed in global terms of the team producing interesting information in the descriptive plan, in tabular and graphical form. The results indicate: i) increased game dynamism in the beginnings and the ends of the matches; ii) bigger variability of the distributions of frequencies of number and duration of the moves of defense, attack and time outs in analysis of the games and the analysis of the quarters of games, where less heterogeneous values are observed in the second and thirds quarters. Data are reviewed with regard to sports sciences finding.

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KEY WORDS: basketball; intensity of the effort; foundations

INTRODUCTION

Lately basketball has had structure modifications and some adaptations must be made to follow such transformations of technical, tactic, psychological or physical nature. Rules are changing, as is the case of the decrease in 20% in the ball-holding time, from 30 to 24 seconds (CBB, 2000). Although some authors have tried to describe the impact of those modifications on the logistics for training aiming to assist planning, elaboration and execution of training and preparing players for more realistic game situations for the quantification of the frequency and time of attack and defense actions need to be deeply explored.

As far as intensity of effort, Naughton, Carlson (1990) developed a study in children (9 to 13 years old) while of doing exercises and in competitions. Higgs et al. (1982) and McInnes et al. (1995), studying high performance adults, presented values for cardiac frequency and blood lactate in three positions of this modality. Borin et al. (1999) suggest, by means of cardiac response in adolescent, there is stimulus of low and high intensity in the performance of different types of basics. In females, Daniel (1992), tried, in elite athletes, to define a profile of activity and its relations to the predominant metabolism in basketball games, through blood lactate. De Rose Jr. and Vasconcelos (1993) identified, by specific instrument, stress – provoking situations during matches as per the perception of 41 members of a national team.

It is believed that ti is necessary to obtain more and more detailed information on the practice of this modality. However, most studies are done in conditions different from that of the real competition, thus shedding doubt on the validity of the results (LEBRE, 1991).

In this context, the present study aims to verity in detail the number and the timing of execution of the moves of defense, attack, time played and timeouts, in games of the National Basketball Male League – 1999/2000.

METODOLOGY

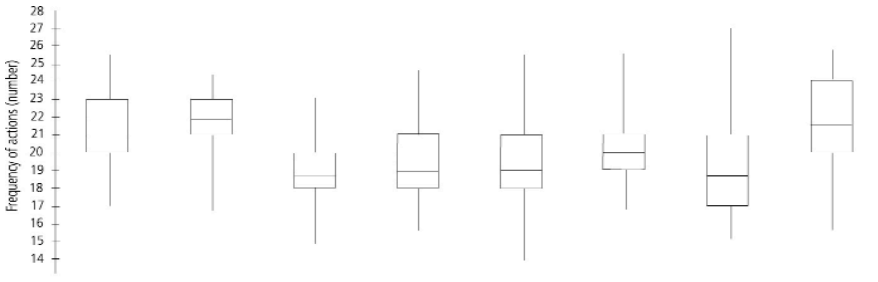
The observational units for study of the effort intensity in the moves and in the timing of games included were the 18 matches by the ADCOC/Ribeirão Preto team, participating in the National Male Basketball Championship. This event is promoted by the Brazilian Basketball Confederation in the adult category and includes 14 teams: the state champions from Santa Catarina, Paraná, Rio Grande do Sul and Minas Gerais; the three best scored teams from

Rio de Janeiro, the six best scored teams from the São Paulo championship and the winner of the Brazilian Championship of the year previous. It should be noted that the matches have four periods of 10 minutes each with a 2-minute interval between the first and second, the third and last quarters of the game, as well as 10 minutes between the second and third quarters.

Data from each game were recorded in a specific protocol, including the time and frequency of permanence in defense, in attack and in timeouts. Then, a databank was constructed in Excel (REISNE, 1994), following analyzes of the consistency of collected information and exploration of the findings. The results were also explored by descriptive statistic involving position measurements and separations, which were presented in tables and graphic (PADOVANI, 1995). Data were processed in global terms, and not separately for each athlete.

DISCUSSION

In FIGURE 1 it can be seen that the mean values for frequency of action of defense and attack, in the first quarter of the match, is more intense than the other, apart from the attack in the last quarter. Another noteworthy point in this period is the lower intensity of variation of frequency of action in the two first quarters (8 and 8, in defense and 7 and 9, in the attack) in comparison to the last two quarters (12 and 12, in defense and 11 and 10, in attack). This variation reveals a greater homogeneity of the actions in the first half of the match.

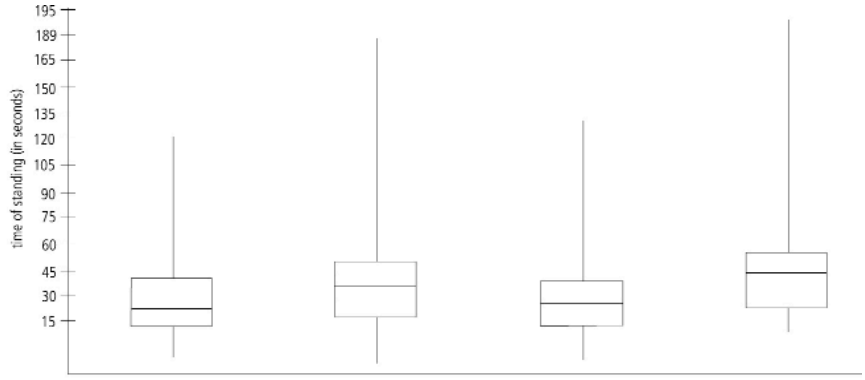


	Defese	Attack	Defese	Attack	Defese	Attack	Defese	Attack
Minimum value	17	17	15	16	14	17	15	16
1st quartile	20	21	18	18	18	19	17	20
Median	21	22	19	19	19	20	19	22
3rd quartile	23	23	20	21	21	21	21	24

FIGURE 1 – Box Plot and descriptive measures of the frequence of actions of defense and attack according to the quarter.

Such behavior can be explained by the fact that in the first quarter the athletes, rested, looked for greater advantage and, thus, expressed greater effort and equilibrium whereas in the last, the influence of weariness of dispute, associated to the attempts to revert an adverse score or even the need to maintain a positive result, can explain results more volatile in this period.

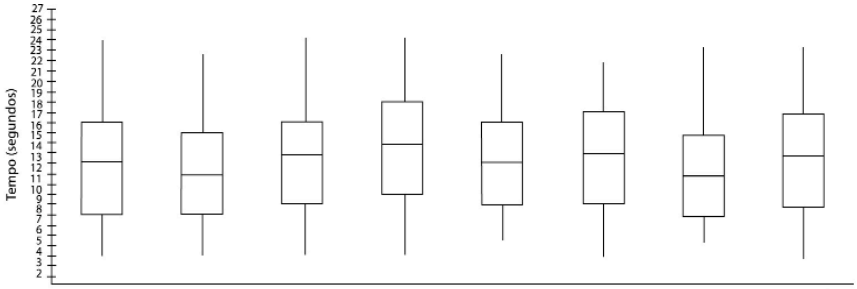
The period of recuperation between moves has also relevance in basketball. FIGURE 2 shows in percentages, the timing of time-outs in the different quarters. It is easily noted that the mean time, in the initial quarter (1st quarter) and in the second half (3rd quarter) shows values clearly inferior to that of the end of the first half (2nd quarter) of the match (4th quarter). The second and last period are noted for their higher values. In fact, here the interval reaches up to three minutes (182 and 196 seconds, respectively), possibly due to the request of the coach, free-throw and the maximum number of personal and collective faults.



	1st quarter	2nd quarter	3rd quarter	4th
minimum value	0	0	0	0
1st quartile	14	20	16	29
median	22	36	25	43
3rd quartile	40	52	42	58
maximum value	126	182	140	196

FIGURE 2 – Box Plot and descriptive measures of time of standing according to the quarter.

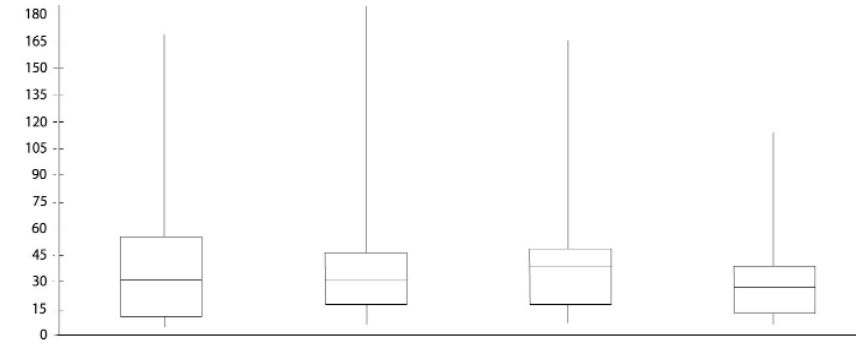
FIGURE 3 presents the behavior of the time in both defensive and offensive moves. Besides small oscillation of the median value, only in the first quarter has the defense a score greater than that for attack. In the relative value to maximum time, it is noted that the end of the first half (2nd quarter) and the end of the match (4th quarter) the results, for both actions, are greater than in the other periods.



Descriptive masures	1st quarter		2nd quarter		3rd quarter		4th quarter	
	defense	attack	defense	attack	defense	attack	defense	attack
minimum value	3	3	3	3	4	3	4	3
1st quartile	7	7	8	9	8	8	7	8
median	12	11	13	14	12	13	11	13
3rd quartile	16	15	16	18	16	17	15	17
maximum value	24	23	25	25	23	22	25	25

FIGURE 3 – Box Plot and descriptive measurees of defense and attacks timing in games according to the quarter.

It can be seen in FIGURE 4 the percent distribution of elapsed time in the different quarters. The median (percentile 50) indicates that the first and second quarters both took 28 seconds, going to 30 seconds in the third and back to 21 seconds in the last quarter. The maximum value is of importance, since it helps coaches and teachers to determine the greater time for the different moves. It can be seen that in the first quarter there are stimulus until the 176th second, that is, 2 minutes and 56 seconds of continuous activity, increasing to 182 seconds (3 minutes and 2 seconds) in the second quarter and decreasing in the third to 168 seconds and 126 seconds in the last quarter.

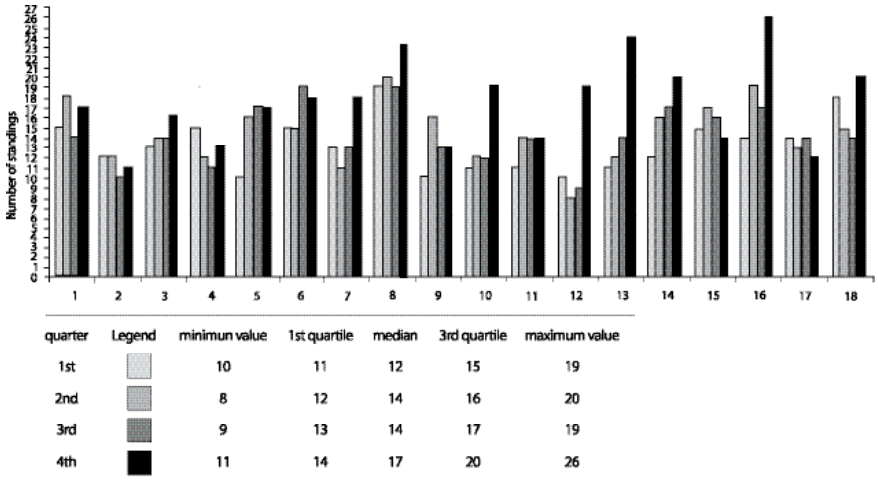


escripive measures	1st quarter	2nd quarter	3rd quarter	4th quarter
minimum value	2	2	3	2
1st quartile	10	16	17	12
Median	28	28	30	21
3rd quartile	56	47	49	39
maximum value	176	182	168	126

FIGURE 4: Box plot and descriptive measure of the elepsed played time according to quarter

Seen in the overall context, the results indicate that (i) the volume of game is greater in the beginning of the match and the action and time dynamics are higher in this segment, (ii) in the second and third quarters there is decrease of these marks, which increase again in the last quarter. An explanation for that could be the fact that in the beginning of the match (1st quarter) the athletes, rested, go for a positive result and in the last again go for a last opportunity to maintain or recover a positive result.

Using a similar procedure in the overall context for team games, it is noted that there is variation in behavior in each match. This reveals the peculiarities found in the confrontation of the different teams participating in the National League, such as (i) players with heterogeneous characteristics, (ii) coaches that prepare tactic schemes aiming to take the adversary by surprise, prioritizing the defense or the attack and (iii) teams with different technical skills. However, for demonstration purposes of descriptive statistical procedures supporting facts of the sport sciences, FIGURE 5 presents the frequency of timeouts in the different matches according to the quarter of the match.



quarter	Legend	minimun value	1st quartile	median	3rd quartile	maximum value
1st		10	11	12	15	19
2nd		8	12	14	16	20
3rd		9	13	14	17	19
4th		11	14	17	20	26

FIGURE 5 – Freqüency of standing according to the quarter

On the one hand, two moments seem to be of importance: the behavior of the 2nd and 3rd quarters, whose values are close in many instances and, therefore, their forms are similar. On the other hand, there is a marked variation between the first and fourth quarter: in the beginning of matches, the timeouts occur with smaller values, in opposition to the last quarter in which the scores are greater. This fact may be due to the dynamism present in the beginning of the match,

to the accumulation of faults in the final period, to the maintenance of a favorable score and probable interaction between these aspects.

As a whole, the results show relevant indication to the intensity of effort, as well as valuable information to coaches for the preparation of athletes: (i) greater volume and dynamic of game in the beginning and end of the match; (ii) greater variability in the distribution of frequency of number and duration of defense, attack moves and timeouts actions when analyzed from different matches than when analyzed from quarter to quarter, in which less heterogeneous values in the second and third quarters are observed.

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