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ANALYSIS OF BASKETBALL GAME: RELATIONSHIP BETWEEN LIVE ACTIONS AND STOPPAGES IN DIFFERENT LEVELS OF COMPETITION

Análisis del juego en Baloncesto: relaciones entre las acciones de balón jugado y balón parado en diferentes niveles de competición

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Abstract

The purpose of this study was to investigate durations of live-time actions (LA) and stoppages (ST) and to compare the distribution of durations among different levels of competition and quarters. LA and ST have been recorded during 21 official games in four different levels of competition: Under 16-years-old (Spanish U16), 3rd division competition (Spanish LEB), 1st division competition (Spanish ACB) and Euroleague (EUR). One-way analysis of variance, Cohen´s d (*d*) were implement to interpret the magnitude of differences and a sequential analysis was also performed. 72.8% of all ST events lasted less than 44 s and only 1% were longer than 120 s. EUR level has longer ST durations compared with LEB (*d*=0.25) and U16 (*d*=0.36). Fourth quarter exhibit the longest durations of ST (*d*=-0.32) due to a higher number of time outs and free throws events. Sequential analysis showed how short durations of LA (<16 s) were followed by short durations of ST (<14 s), and long ones (>46 s) activated long periods of SP (>38 s). The practical application of these results should be considered for the design of game-based conditioning programs, especially by understanding the most demanding scenario, with applicability in different levels of basketball.

Keywords: Team sport; time analysis; observation; elite; academy.

Resumen

El propósito de este estudio fue investigar la duración de las acciones jugadas y el tiempo de pausa (ST) y comparar la distribución de las duraciones entre los diferentes niveles y cuartos. La duración se ha registrado durante 21 partidos oficiales en cuatro niveles competitivos: Cadetes (U16), 3ª división española (LEB), 1ª división (ACB) y Euroliga (EUR). Se implementó un análisis de varianza, la *d* de Cohen (*d*) para interpretar la magnitud de las diferencias y un análisis secuencial. El 72.8% de las ST duraron menos de 44 s y solo el 1% fueron más largos que 120 s. En EUR las ST fueron más largas que en LEB (*d*=0.25) y U16 (*d*=0.36). El último cuarto exhibe las duraciones más largas de ST (*d*=-0.32) debido a un mayor número de tiempos muertos y eventos de tiros libres. El análisis secuencial mostró cómo las duraciones cortas de acciones jugadas (<16 s) fueron seguidas por duraciones cortas de pausa (<14 s), y las largas (>46 s) activaron largos períodos pausa (>38 s). La aplicación práctica está orientada al diseño de programas de entrenamiento basados en el juego, especialmente para comprender los escenarios más demandantes, con aplicabilidad en diferentes niveles de baloncesto.

Palabras clave: deporte de equipo; análisis temporal; observación; elite; formación.

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Introduction

Basketball is the second sport with the most licenses worldwide (Scanlan, Teramoto, Delforce, & Dalbo, 2016). This popularity among other sports has led researchers and clubs to try to shed the internal logic of the game in search of factors or variables that could understand game`s complexity. Such knowledge about the game can lead to the development of strategies for improving the performance of the players and, as a result, in a greater show for the fans.

The timing of the game can be carried out with a temporary limit of 24 s in the possession of the ball by a team. Although, if that time limit is not exhausted, the exchange of possessions will happen continuously until the referee stops the game for a violation of rules. A break by the technical staff in the form of "time out" (TO) or substitutions are also possibilities where game can be stopped. It is this alternation between the ball-in-play and the stoppages (ST) which gives the basketball a character of intermittence, beyond the merely studied during the "live time" (Torres-Ronda, Ric, Llabres-Torres, De las Heras, & Schelling, 2016). The knowledge of the frequency, duration and order of live actions (LA) and stoppages may provide a useful information for practitioners to better understanding demands of the game.

Across the available literature (Stojanović, Stojiljković, Scanlan, Dalbo, Berkelmans, & Milanović, 2018), it is clear that most of the playing time is performed in low- to moderate-intensity activities (23.4-66.3%), while only the 0.4-9.3% is given to high-intensity actions. Although, the knowledge on the total distribution of the load is well-founded, it is not known how the demands of the competition are linked and, in particular, the description of the most demanding scenarios (Gabbett, Kennelly, Sheehan, Hawkins, Milsom, King et al., 2016), what has already begun to be investigated in other team sports such as rugby (Delaney, Duthie, Thornton, Scott, Gay, & Dascombe, 2016) or football (Martín-García, Casamichana, Díaz, Cos, & Gabbett, 2018). The description of playing and rest time may describe the most demanding passages (e.g., large life action periods) that occur during basketball game and therefore, could help coaching staff in developing a better and more efficient training programs.

From a dynamic perspective, the scientific literature focused on sequential analysis on basket is scarce (Anguera & Hernández-Mendo, 2015), and despite the importance in the order of occurrence on decision-making in this sport, very few studies have centre the attention on it. Basically, from this prespective it is promoted the study of the teams as a network, defining players as nodes and ball movements as links (Courel-Ibáñez, Suárez-Cadenas, & Cárdenas-Vélez, 2017). Lag sequential analysis has proven to be a powerful tool for analyzing activation or inhibition between what are known as given and target behaviors (Bakeman & Quera, 2011). From this approach, it could be interesting to predict the existence of particular transition patterns among effective game and break states in basketball.

Situational variables have been analysed in previous studies to distinguish players according to the playing level at which they play showing that senior players performed higher number of fouls during games with similar number of ball possession compared with junior level (García, Ibáñez, Parejo, Cañadas, & Feu, 2010). These episodes of fouls (F), or TO would result in more time of stoppages during the game, allowing short-term recovery periods for players (Ostojic, Markovic, Calleja-Gonzalez, Jakovljevic, Vucetic, & Stojanovic, 2010). Similar results for activity frequency and total distance covered by player have been shown between the four quarters of the game (Abdelkrim, Castagna, El Fazaa, & El Ati, 2010; Scanlan, Dascombe, Reaburn, & Dalbo; Matthew & Delextrat, 2009). Moreover, the time spent in high-intensity activities during the first quarter was longer (Abdelkrim et al., 2010) and significantly decreased in the last quarter (Abdelkrim, El Fazaa, El Ati, & Tabka, 2007).

For all the above, the purpose of the present study is twofold: on one hand, to describe the durations of the effective game live actions and stoppages time, and to investigate diachronic relationships among these states. On the other hand, the aim was to compare the distribution of game durations in different levels of competition. The applications of the results of this study are directly connected to practical application in training process. Information from this study would allow coaches to design and put into practice different strategies that stimulate competition demands, preparing players for the most demanding scenarios of the games.

Method

Design

Among the possible observation designs, taking as a reference the criteria number of units or participants and temporality (Anguera, Blanco, Hernández, & Losada, 2011), the design of the study is located in quadrant III, considering the basic features of: punctual, nomothetic and multidimensional. The location in this quadrant is justified because the fact that there are several units that will be observed (different teams), the record despite being carried out during a season, no follow-up analysis has been applied. Nevertheless, there is within-session (game) sequential following of the events. Since the registered data was sequentially recorded (Castellano, Perea, Alday, & Hernández-Mendo, 2008), it was possible to conduct intensive diachronic study (e.g., synchronic analyses can be used to investigate associations between categorical variables).

Participants

A total of 21 full games have been randomly selected during the 2017-18 and 2018-19 seasons, in the competitive period. The divisions analysed were EURO (Euroleague or elite European League, n = 5 games), ACB (Spanish first division, n = 5 games), LEB (3rd Spanish division, n = 5 games), U16 (Spain U16 championship, n = 6 games). Categories were selected corresponding from an elite Spanish basketball team in which the first team compete at elite level (ACB and Euroleague), second team in LEB and U16 team from academy basketball. All the matches followed the FIBA (International Basketball Federation) standards and were analysed only during competitive period of season. Pre-season and play-off games were excluded. Games were selected with a final result of ±10 points in order to have a homogeneity sample and were coded on live time in the court where the game was played.

This study has received the approval of the Committee of Ethics in Research involving humans' beings (CEISH) of the University of the Basque Country (UPV/EHU).

Variables: Live actions and Stoppages

The temporal distribution of the events during the game were carried out considering the effective time of live actions (LA) and break time or stoppages (SP). LA was considered since the referee indicated and gave the ball to the player to put it into play. At the moment, in which the referee stopped the game, a SP time was measured until a new LA event started. The SP was divided using a taxonomic system with different exhaustive and mutually exclusive categories (Table 1).

Table 1. Codes and description of the stoppage's categories.

Code	Description
TO	Duration between the referee for the game until it is put back on march having a "time out" within this period. During this time, substitution can occur.
FT	Time elapsed between the signalling of the offense by the referee until the player throws the last free throw corresponding to the infraction. During this time, substitution can occur.
FAUL	Time elapsed between the fault indication by the referee until the referee gave the ball to the player to start the game again. During this time, substitution can occur.
OUT	Time elapsed between when the referee indicates that the ball has left the limits of the field until it starts the game. During this time, substitution can occur.
IQ	Time elapsed between the 1st and 2nd quarter and between the 3rd and 4th quarter.
HT	Time elapsed between the end of the 2nd quarter and the 3rd quarter.
OTHER	Situations of fights, substitutions, foot infringement, end of possession and arrests by the referees for the use of instant replay, conversations with coaches and technical problems.

Procedure

Prior to the registration of all matches, a test of the quality of the data was carried out. The matches were encoded live from the coding tool configured in EasyTag® and was performed by an experienced researcher (more than five year working as analyst). Subsequently, the intra-observer concordance analysis was implemented, estimating Cohen's Kappa coefficient (Cohen, 1988), using the GSEQ 5.1 computer application for Windows (Bakeman, Quera and Gnisci, 2009).

For this analysis, two types of strategy were used, considering the records as event-type data or state-type data. In the sequence of events, only the occurrence of the categories is considered, while the sequence of states also considers the duration of each of the categories (Anguera, Blanco-Villaseñor, Losada and Hernández-Mendo, 2000). In both cases, the value of the Kappa was optimal, 0.91 and 0.70 for the events and the states (with a time window of five seconds), respectively. These results can be considered optimal to carry out the study from this coding tool and with this training of the observers.

Statistical analysis

Data was presented as mean, 95% confident intervals (95%CI) and range done using iNZight version 3.0.3 (released 12 October 2016, http://www.gnu.org/licenses/gpl-2.0-standalone.html, the University of Auckland, New Zealand) running in R version 3.2.3. In order to analyse the data, the statistical package SPSS version 24.0 (SPSS Inc., Illinois, USA) for Windows was used for the descriptive analysis and comparison of means. The comparisons were carried out for competition level (EURO, ACB, LEB and U16) and quarters, from first to forth one (Q1, Q2, Q3 and Q4, respectively).

The sequential analysis program GSEQ 5.1 was also used for Windows (Bakeman et al., 2009) to carry out the sequential analyses. The results of the lag sequential analysis were interpreted by using the adjusted residuals obtained for each of the given behaviours (La and SP grouped according to their duration) in the two first lags studied. Afterwards, an analysis of their relationship with each of the target behaviors (the same grouped categories; e.g., 1st lag = from LA to SP and from SP to LA, and 2nd lag = from LA to LA). Each of the prospective lags (plus one or two) showed whether the target behaviours have an activating or inhibitory effect on the subsequent state (LA or SP grouped). LA and SP were grouped according to divide the duration in quartiles. The grouping for the LA was: LAQ1 = durations of <16 s, LAQ2 = durations between 16 and 28 s, LAQ3 = durations between 28 and 46 s, and LAQ4 duration >46 s. With respect to SP, the groups were: STQ1 = durations of <14 s, STQ2 = durations between 14 and 22 s, STQ3 = durations between 22 and 38 s, and STQ4 duration >38 s.

A one-way ANOVA with Bonferroni post-hoc test was executed in order to compare means of LA and ST event by 1) levels and 2) quarters. The effect size of the differences was calculated and qualitative interpretations were provided as follows: 0-0.19 trivial; 0.2-0.59 small; 0.6-1.19 moderate; 1.2-1.99 large; > 2 very large (Cohen, 1988; Hopkins, 2002). Coefficient of variation (CV) was calculated, standard deviation divided by the mean per 100, for LA and ST variables. Levels of p <0.05 were adopted as an indicator of significance.

Results

Descriptive analysis

A total of 3,093 observations was used for analysis. The number of events per game of LA were (71.4 ± 5.6) being the highest in matches ACB (ACB > LEB [d = 2.01, *very large*], > U16 [d = 1.11, *moderate*] and > EUR [d = 1.33, *large*]) as well as the number of F. For the event OUT: U16> LEB [d = 1.17, *moderate*], > ACB [d = 1.99, *large*] and> EUR [d = 2.62, *very large*]. As for TL and TM, the ACB is the competition where it occurs most frequently per game assuming 14% and 6% of the shares, respectively.

In the quarter analysis highlights the increase of TO during the Q4 of the game, assuming 7% of the total shares of the Q4. Lower FT during the Q1 compared with the other three (Q1 < Q2 [*d* = 0.74, *moderate*], <Q3 [*d* = 0.67, *moderate*] and <Q4 [*d* = 0.75, *moderate*]). The number of LA shares increased by Q2 compared to Q4 [*d* = 0.04, *trivial*], Q3 [d = 0.32, *small*] and Q1 [*d* = 0.51, *small*].

LA had an average (95%CI) duration of 34.6 s (32.1-37.1 s), while ST was 31.8 s (28.3-34.5) s, obtaining a work / rest ratio of 1.1. Most of LA's actions were concentrated below the 44 s of duration (72.8% of the total of the events) and almost 85% of all are below the minute of duration. Very few balls in play (around 1%) last more than 120 s. In terms of ST events, 75.9% had a duration of less than 39 s, although there was a high percentage of ST events (24.1%, corresponding to FT and TO) above 41 s. Finally, the 13.1% of ST shares have a duration of less than 10 s.

Figure 1 showed mean (95%CI) duration of LA the four different leagues: U16: 34.4 s (31.9-37.0 s), LEB: 36.5 s (34.0-39.1 s), ACB: 33.0 s (30.6-35.4 s) and EUR: 34.4 s (31.7-37.1 s). As well as SP: U16: 27.1 s (24.9-29.4 s), LEB: 30.2 s (27.7-32.7 s), ACB: 33.0 s (30.0-36.0 s) and EUR: 36.9 s (33.7-40.1 s). There were differences in ST between EUR with LEB and U16 (p <0.01, *d* = 0.25 small: p <.01, *d* = 0.37 *small*) and ACB with U16 (p <.01, *d* = 0.21 *small*).

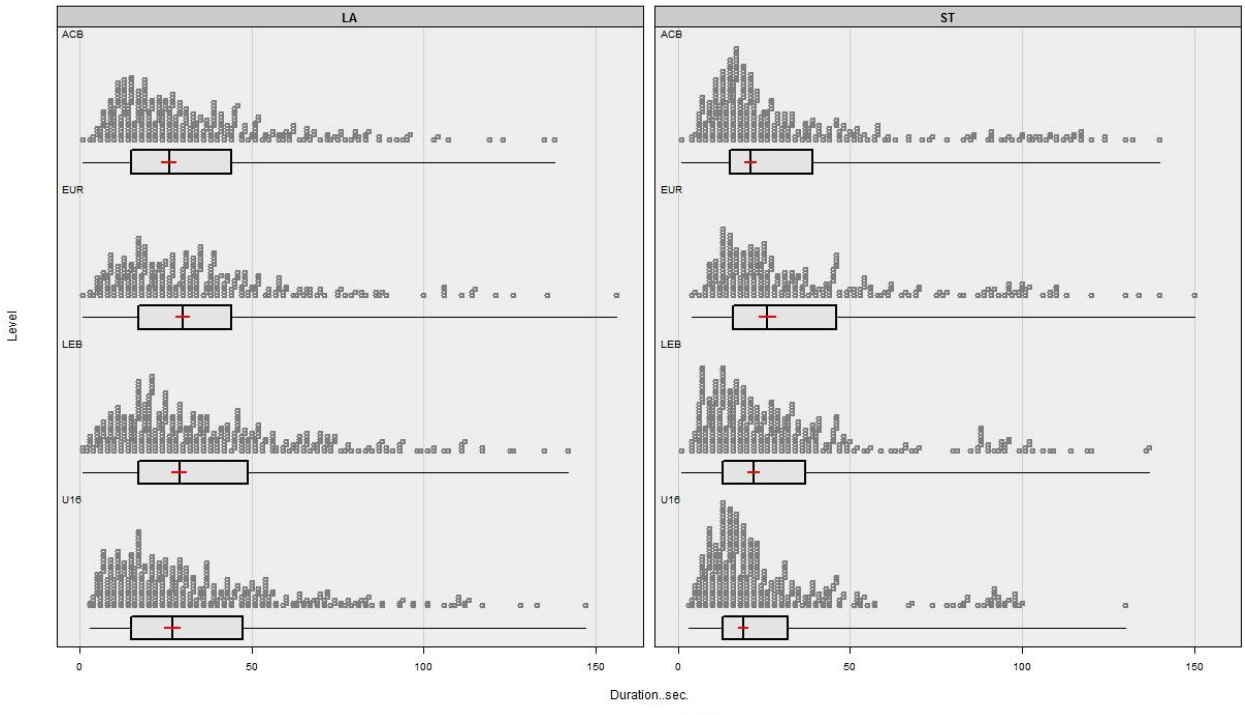

Figure 1. Frequency of the durations of live-actions (LA) and Stoppages (ST) in EURO (Euroleague or elite European League), ACB (Spanish first division), LEB (3rd Spanish division) and U16 (Spain U16 championship).

Mean (95%CI) duration for LA between quarters were as follows: Q1: 37.1 s (34.2-40.1), Q2: 33.1 s (30.7-35.5 s), Q3: 35.2 s (32.6-37.7 s) and Q4: 33.6 s (31.3-36.0 s). For ST event, significant differences were found between Q1 with Q2 and Q4 (p<.01: *d* =-0.25 *small*: p<.01: *d* = -0.32 *small*), respectively (Figure 2).

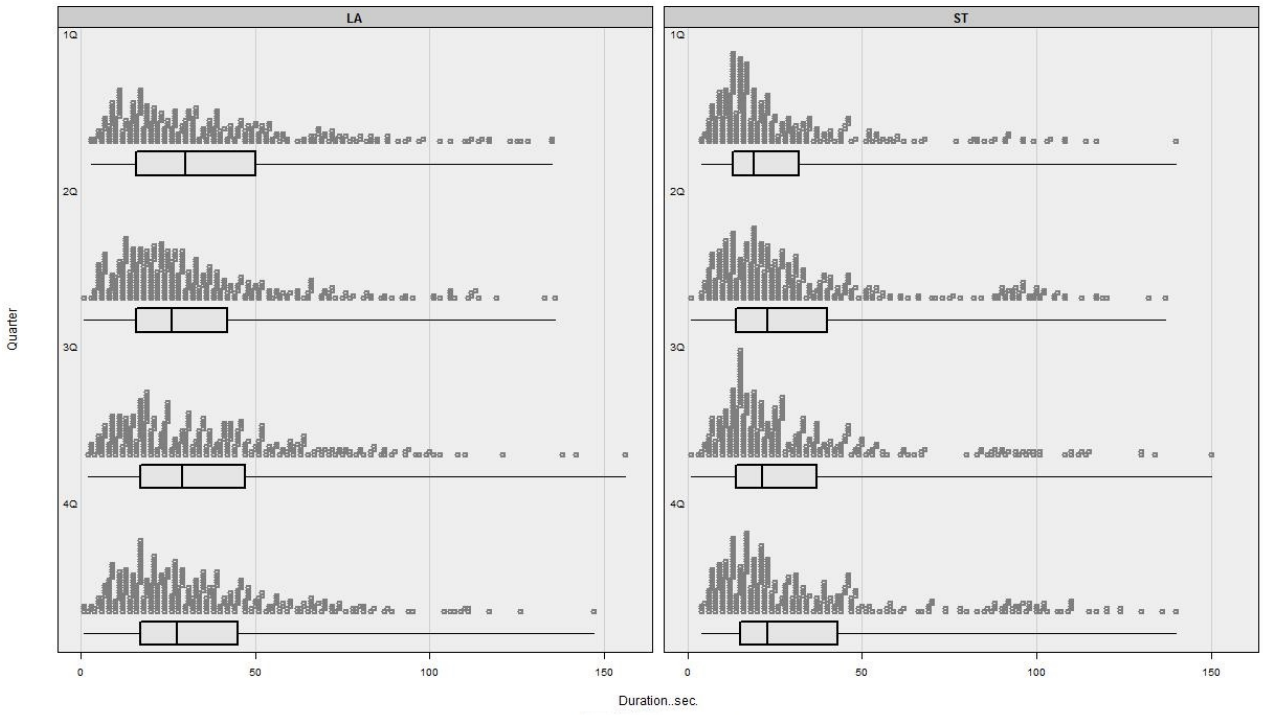

Figure 2. Frequency of the durations of live-actions (LA) and Stoppages (ST) by quarters. 1Q is first quarter, 2Q is the second quarter, 3Q is the third quarter and 4Q is the fourth quarter.

Sequential analysis

In Table 2, the results of adjusted residuals (RSAJ) are shown for three types of analysis. Firstly, as the lag +1, LA was taken as a function of the duration and considering as conditioned variables the four sub-categories of ST. For interpretation, values above 1.96 or below -1.96 significantly highlight the activation or inhibition, respectively, of these categories with respect to the criterion category (Bakeman et al., 2009).

As can be appreciated, short ball durations in play triggered the presence of short stopped ball durations (STQ1) and inhibited the long stopped ball durations (STQ3 and STQ4). On the same line, longer duration balls brought with it a later presence of long-term stopped balls for the lag +1. This same tendency also occurred for the second of the delays, that is to say, with the next ball in play once it was resumed, being that again the presence of short ball durations in game (LAQ1) was inhibited and the presence of durations was activated long (STQ4) of ball in play. On the other hand, when the ST variables were considered as focal behaviour, no significant transitions were found towards periods of less or longer duration, with the exception of the STQ1-LAQ3 pattern.

Table 2. Values of adjusted residuals of the sequential analysis.

	Target variables							
	lag +1				lag +2			
Given variables	SPQ_1	SPQ_2	SPQ_3	SPQ_4	LAQ_1	LAQ_2	LAQ_3	LAQ_4
LAQ_1	7.08*	0.36	-2.58*	-4.76*	0.67	0.46	-1.42	0.23
LAQ_2	1.23	-0.52	-0.49	-0.18	1.50	0.22	-0.13	-1.59
LAQ_3	-2.61*	1.30	-0.23	1.49	-0.12	0.05	1.60	-1.43
LAQ_4	-5.67*	-1.07	3.21*	3.44*	-2.00*	-0.71	0.00	2.68*
Given variables	LAQ_1	LAQ_2	LAQ_3	LAQ_4				
SPQ_1	0.30	-0.92	1.98#	-1.27				
SPQ_2	-0.27	0.08	0.57	-0.34				
SPQ_3	1.21	0.08	-1.85	0.46				
SPQ_4	-1.24	0.73	-0.62	1.10				

Note: * is *p<.01, # is p<.05.* LAQ1 = durations of <16 s, LAQ2 = durations between 16 and 28 s, LAQ3 = durations between 28 and 46 s, and LAQ4 duration> 46 s. SPQ1 = durations of <14 s., SPQ2 = durations between 14 and 22 s, SPQ3 = durations between 22 and 38 s, and SPQ4 duration> 38 s.

Discussion

The present study evaluated the time in which basketball players were actually playing, and time when the game was stopped with a specific perspective to event`s durations and sequential patterns between them. The main results of the study indicated that regardless of the competitive level and the games' quarters, the average duration of activity and break is around 30 s (35 and 31 s for LA and SP, respectively), however, there is a high variability in both states (CV = 75%). This high variability encompasses scenarios of prolonged demands (e.g., long duration) where the duration of LA is greater than 120 s of continuous play along with ultra-short passages that do not exceed 5 s of activity. Considering the sequential aspect of events, as has been previously proposed (Fernandez, Camerino, Anguera, & Jonsson, 2009), the estimated patterns showed probabilities of transition between events over those estimated by random. It should be noted, for example, that reduced live periods also activated SP of short duration, while longer durations of LA time implied the later presence (lag +1) of longer periods of SP. However, same patterns did not happen when the SP were considered as focal or criteria category, where it practically did not activate the presence of any particular LA time, with the exception of STQ1 with LAQ3.

In all categories and quarters, the competition showed that 85% of LA action were below one-minute duration and breaks were shorter than 39'' in the 75,9% of cases. These data were in contrast with previous values recorded in seasonal and tournament Australian games were mean playing time and break periods were longer (Klusemann, Phyne, Hopkins & Drinkwater, 2013). These data indicate that short conditioning intervals (20- to 50 s) with work to rest ratio of 1 may be more specific for basketball game-based training. Furthermore, basketball players need a high metabolic capacity in order to be prepare for worse scenarios during games with durations above 120 s of playing time and short breaks times (10-to 20 s).

Considering the competitive level of the games, the results showed that as the level was higher, SPs had a longer average duration. There are many factors that can justify these results, from tactical decisions, such as the type of defence (e.g, individual, zone...) or the use of TO strategically by coaching staff (e.g: breaking the opponent's winning streak) that can influence the dynamics of the game and, therefore, the scoreboard (Toro, Andrés, Gómez, Godoy, Lorenzo, & Sampaio, 2010), although it does not seem to affect the player's physical response (Sampaio, Leser, Baca, Calleja-Gonzalez, Coutinho, Gonçalves et al., 2016). The importance of the competitive level seems to have an impact on the decisions made in the game and, therefore, on the dynamics involved within it. In the same way, referee's decisions have a great impact, which is why normally referees are more likely to review dubious plays with more thoroughness. This favours the recovery of the players, because during the ST the player is passively standing or performing a very low intensity activity (walking) that promotes a short-medium passive recovery of the athlete, which could help them to maintain high intensity levels for longer periods of time when the ball is in play (Dupont, Blondel, & Berthoin, 2003). The results found were in contrast to previous studies where no differences were found in the duration of ST in junior international vs. national players (Ben Abdelkrim et al., 2010), or in professional versus semi-professional (Scanlan, Tucker, Dascombe, Berkelmans, Hiskens, & Dalbo, 2015). In the present work, these differences exist in the duration of the SP between different competitive levels. Studies in soccer have shown that a higher competitive level is usually linked to a greater weight of the stopped ball, being in many cases a goal to set pieces what elucidates the winner of the match (Castellano, Casamichana, & Lago, 2012).

Regarding the number of sub-events, a greater number of FT and TO were observed in the higher-level leagues (EUR and ACB). This fact can be justified that in higher level of competition, quality of the players was greater and, therefore, the level of play increases, producing more fouls on the opponent (e.g., playing at the limit of the regulation), which carries with it a greater number of free throws (García et al., 2010). In addition, it should be noted that in elite basketball, some of the TO are predetermined by televisions for the advertising during games. In other cases, it is the coaches themselves who use all the TOs allowed to stop rival streaks or correct and propose improvements in the team itself (Sampaio, Lago-Peñas, & Gómez, 2013). Regarding the OUT sub-event, the lower level of the players in the U16

and LEB leagues means that there is a greater number of times the ball goes out of the field in opposition to the higher-level players, who have greater control of possession of the ball (Abdelkrim et al., 2007), not accumulating so many turnovers.

According to the comparison between game quarters, the results showed that Q1 and Q3 were the ones that had the longest average effective game time. Conversely, Q2 and Q4 had more time of ST, which can be explained by the deterioration of the conditional capacity of the players as the quarters of the game pass (Brewer, Dawson, Heasman, Stewart, & Cormack, 2010). In the study by Scanlan and colleagues (2015) they observed a detriment in the duration of the high intensity actions as the quarters go on. This could be aligned to the results of the present work, where it has been found that during the last quarter of the game, the LA periods were of shorter duration, coinciding nevertheless with the high intensity actions (Scanlan et al., 2015). There are numerous physiological factors that can explain this fall in performance over the course of the game, mainly the depletion of muscle glycogen, the increase in body temperature, dehydration or muscle damage (Duffield, Coutts, & Quinn, 2009; Sirotic, Coutts, Knowles, & Catterick, 2009). During a game of basketball, Q1 and Q3 are preceded by warm-up and half-time break, respectively, which suggests that the player is more rested and, therefore, can be used to the maximum without causing or incurring stoppages. The conditional aspect is accompanied by the strategic value that marks the periods before the break (Q2) and, especially, at the end of the game (Q4), where the result is acquiring a key weight in the dynamics of the game and where they begin to use strategies adapted to the momentary needs of the teams (e.g. make quick fouls, ask for time-out) (García-Rubio, Gómez, Cañadas, & Ibáñez, 2015).

In team sports, different tactical responses have been proposed as a means of influencing the duration of actions during the match (Andersson, Randers, Heiner-Møller, Krustrup, & Mohr, 2010). In basketball, even matches can be defined by strategic issues mainly carried out in the last part of the game. A greater number of sub-events of FT and TO, causes that the game stops in a greater number of times, and that mentioned actions are of greater duration in the 2nd and 4th quarter. The importance of these last actions in the final outcome means that the player is under great psychological pressure (Ferreira, Volossovitch, & Sampaio, 2014; Gómez, Lorenzo, Jiménez, Navarro, & Sampaio, 2015), which will lead them to take more time on the execution and increase the duration.

Although the study does not seek a broad generalization of the results but rather provide relevant information on the dynamics of the game, there are a number of limitations that need to be considered when attempting to interpret the results. It should be noted, for example, that the result has not been included in the score, instantaneous and final, which probably would have allowed to refine the description of how the teams handle this dynamic of LA and ST. A recent study (Gómez, Bastida-Castillo, García-Rubio, Pino-Ortega, & Ibáñez, 2019) suggests that when the result is not adjusted there is a greater physical demand, which, although it seemed illogical at first (e.g., less physical exigency in an equal match), must be interpreted in the sense that when there is a clear difference in the score between the teams, they seem to be involved in a more 'permissive' dynamic and, as a consequence, with fewer interruptions during the game. Another of the limitations encountered may be the regular differentiation of the games according to their importance or the moment of the season, since league or playoff matches could affect the duration of the actions (Gomes, Rebello-Mendes, Almeida, Zanetti, Leite, & Figueira, 2017; Moreno, Gómez, Lago, & Sampaio, 2013).

Conclusion

The main conclusion of the study was that the live actions and stoppages have a similar average duration - close to 30 seconds each one. Nevertheless, there is a high variability in the durations of LA and ST, regardless of the level of competition and the game´s period (i.e. quarter). However, there were some differences between them that could be considered to propose specific intervention strategies for training in youth and elite teams. The second conclusion of the present work was that, although the duration of LA and ST is highly random since the dynamics of the game is altered by a multitude of factors, there is a certain relationship where short LA durations activate short rest periods. The same would occur with long durations. However, this relationship is more variable when we take the SP as the main period.

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