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Key variables for predicting scoring success in Brazilian basketball games

Abstract

The objective of this study was to identify the variables that can predict the number of points scored by teams in Brazil's national basketball league. A total of 182 NBB games were analyzed using scouting variables including free-throw, 2-point, and 3-point shooting percentages; free-throw, 2-point, and 3-point attempts; number of defensive and offensive rebounds; number of assists, steals, turnovers, violations, and fouls committed and received. A Multiple Linear Regression analysis (SPSS, v.19) was used to determine which variables predict the number of points scored in a game. The prediction of the number of points scored was achieved (a) without considering shooting variables, (b) considering only shooting-related variables, and (c) considering all analyzed variables, explaining 30.5%, 62.9%, and 63.2% of the variation in scoring behavior, respectively. These findings can be used to enhance basketball training by focusing on the most determinant variables for scoring in games.

Keywords: basketball technical indicators, tactical action, game dynamics, statistical analysis, basketball

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Victor Hugo Alves Okazaki, Emanuel Messias Oliveira de Carvalho
Department of Physical Education, State University of Londrina, Brazil

Correspondence: Victor Hugo Alves Okazaki, Department of Physical Education, State University of Londrina, Brazil, Tel +55 (43)99979-4047, Email vhaokazaki@gmail.com

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Introduction

Basketball is a dynamic and complex sport[1] that requires the execution of specific technical skills and tactical actions during the game.[2] As the sport becomes increasingly competitive, understanding the interaction between these specific in-game actions can be the deciding factor between victories and defeat.[3] The analysis of these technical and tactical indicators has been conducted through statistical analysis of scouting data, which monitors the behavior of players and teams during games.[4]

Statistical analysis of games is a crucial tool for planning and organizing training, controlling the learning process, and identifying the key factors that determine basketball game outcomes.[5] To describe the determining factors of basketball games, several studies[6–9] have sought to identify which statistical indicators can distinguish winning teams from losing ones. Generally, the main indicators that differentiate teams include successful 2-point and 3-point shots, successful free throws, defensive rebounds, assists, steals, and fouls received.[5–9] Despite the contributions of these studies to our understanding of key statistical indicators in differentiating winners from losers, these analyses have been conducted exclusively on European leagues. Therefore, it is also essential to analyze other basketball leagues to understand the unique factors that different levels of performance and basketball schools contribute to game-winning strategies.

Understanding the factors that determine the number of points scored in a basketball game is another crucial aspect of success in this sport.[2,3] However, basketball is a complex sport where all in-game actions interact with each other.[9–11] Thus, predicting the points scored in a game cannot be done solely based on the number of shots taken. It is necessary to comprehend the significance of other game indicators, such as the relationship between technical skills and in-game actions.[7] Therefore, the analysis of point prediction in games through statistical indicators warrants further attention. Notably, most studies in the literature focus on European and North American basketball. Understanding the factors that determine scoring in other leagues, such as Brazil's basketball league, can enhance our understanding of the specific characteristics that basketball exhibits when played in different regions of the world.

The objective of this study was to identify the variables that can predict the number of points scored by teams in Brazil's national basketball league. Specifically, a statistical prediction analysis of point scoring was conducted through a three-stage approach: (a) without considering shooting variables, (b) considering only shooting-related variables, and (c) considering all analyzed variables (technical skills and tactical actions). The results of this study can provide valuable insights for athletes, coaches, and basketball practitioners by identifying the most critical variables for scoring in Brazil's basketball league games.

Methods

Sample

The study was conducted by analyzing 182 games (adult male category) from the regular season of the 2nd Edition of "Novo Basquete Brasil" (NBB2) during the 2009/2010 season. Official statistical analyses of all games were used, which were made available online by the Liga Nacional de Basquete (LNB). Each participating team had its own scouts responsible for the game analysis, who were trained by the league prior to the start of the championship.

Study procedures

Initially, data from the game statistics of Novo Basquete Brasil (NBB) were accessed through the official website (http://www.liganacionaldebasquete.com.br). To avoid bias due to one team having a greater number of possessions than the other a factor that could skew the results of the dependent variables the variables were normalized based on the number of possessions. This normalization process has been performed and recommended in previous studies.[12,13] The normalization was achieved by multiplying the dependent variable of interest by 100 and dividing the result by the number of possessions in the game. The formula proposed by Oliver[14] was used to calculate possessions: PB = (Field Goals Attempted - Offensive Rebounds + Turnovers - 0.4 x Free Throws Attempted).

The technical fundamentals and game actions analyzed included: 2-point field goal percentage, 2-point field goals attempted, 3-point field goal percentage, 3-point field goals attempted, free throw percentage, free throws attempted, defensive rebounds, offensive rebounds, assists (passes to a teammate that lead directly to a score), steals (recovering the ball by intercepting an opponent's pass or dribble), turnovers, violations (infractions such as traveling, double dribble, and errant passes), fouls committed, and fouls received.

Next, statistical analyses were conducted to test for normality, homoscedasticity, and independence of data using the Kolmogorov-Smirnov, Bartlett, and Box-M tests, respectively. Following this, a Multiple Linear Regression analysis was performed to identify which independent variables predict the number of points scored. The final score of the game was the dependent variable, while the technical fundamentals and game actions were the independent variables. The analyses were conducted under the following conditions:

(a) Since shots are directly responsible for scoring in basketball, the variables related to shooting were excluded (2-point field goal percentage, 2-point field goals attempted, 3-point field goal percentage, 3-point field goals attempted, free throw percentage, and free throws attempted). This first analysis aimed to understand the contribution of the remaining variables in organizing gameplay to maximize shot opportunities and points scored.

(b) The second analysis focused exclusively on the shooting variables to identify the importance of each in contributing to the scoring.

(c) The third analysis included all available variables in the scout to determine whether there was any change in the weight of the variables when considering a comprehensive view.

(d) The fourth analysis utilized all the study variables to identify the prediction of scoring across different classifications of games.

Results

Table 1 presents the mean values of the variables analyzed across all Brazilian basketball teams.

Table 1 Variables analyzed across all Brazilian basketball teams

Variables	Mean (SD)
3Pts Attempted	31,14 (7,57)
2Pts Attempted	48,10 (8,32)
L-L Attempted	27,18 (8,47)
Offensive Rebounds	12,29 (4,98)
Deffensive Rebounds	28,12 (6,24)
Assists	18,25 (6,29)
Steals	9,77 (4,09)
Fauls Drawn	24,38 (5,23)
Fauls Committed	25,64 (5,23)
Turnovers	13,41 (4,81)
Violations	3,32 (2,43)
3Pts %	35,80 (11,43)
2Pts %	26,85 (5,99)
Freethrow %	27,18 (8,47)

Multiple regression without shooting variables

The multiple regression analysis allowed for the prediction of team scoring based on the variables, excluding shooting-related variables. The analysis performed using the Stepwise method identified the following variables in descending order of contribution to the regression: assists, turnovers, defensive rebounds, and fouls drawn (Table 2). However, this model was only able to explain 30.5% of the variation in the number of points scored.

Table 2 Contributions of models (r and R^2) to the prediction of the number of points and statistical coefficients (F and P) from the multiple linear regression analysis using the Stepwise method

Model	r	R^2	F	Significance
1	0,487	0,237	F1,362=112,4	P<0,001
2	0,520	0,271	F1,361=16,7	P<0,001
3	0,539	0,290	F1,360=9,9	P<0,005
4	0,552	0,305	F1,359=7,8	P=0,005

Legend: Model 1 – Assists; Model 2 – Assists + Turnovers; Model 3 – Assists + Turnovers + Defensive Rebounds; Model 4 – Assists + Turnovers + Defensive Rebounds + Fouls Drawn.

Considering all the variables in the model found by multiple linear regression analysis, it was found r=0.552 (R^2=0.305; F1, 359=7.8; P=0.005) for the following prediction equation for the number of points (Table 3): Number of Points = 68.55 + 1.52 * (Assists) + (-0.70) * (Turnovers) + 0.45 * (Defensive Rebounds) + 0.49 * (Personal Fouls Received) (Equation 1)

Table 3 Variables used for the development of the prediction model for the number of points, statistical coefficients, and prediction constants from the Stepwise method

Model	Variable	B	Constant	T	Significance	R
1	Assists	1,45	84,98	10,6	P<0,001	0,487
2	Assists	1,52	94,47	11,3	P<0,001	0,487
	Turnovers	-0,80	94,47	-4,1	P<0,001	-1,21
3	Assists	1,49	81,14	11,1	P<0,001	0,487
	Turnovers	-0,75	81,14	-3,8	P<0,001	-1,21
	Defensive Rebounds	0,47	81,14	3,1	P=0,002	0,185
4	Assists	1,52	68,55	11,4	P<0,001	0,487
	Turnovers	-0,70	68,55	-3,6	P<0,001	-1,21
	Defensive Rebounds	0,45	68,55	3,0	P=0,003	0,185
	Faults Drawn	0,49	68,55	2,8	P=0,005	0,101

Multiple regression for shooting technical variables

The multiple regression analysis allowed for the prediction of team scoring based on the variables (considering shooting variables). The analysis performed using the Stepwise method revealed the following descending order of contribution to the regression: assists, turnovers, defensive rebounds, and personal fouls received (Table 4). This model was able to explain 62.9% of the variation in the number of points.

Considering the variables included in the prediction model for the number of points, it was found that r=0.793 (R^2=0.629; F1, 357=11.1; P=0.001). This model allowed the development of the following prediction equation for the number of points (Table 5): Number of Points = -102.78 + 1.17 * (2 Pts %) + 0.95 * (3 Pts %) + 1.09 * (2 Pts Attempted) + 0.93 * (3 Pts Attempted) + 0.73 * (Free Throws Attempted) (Equation 2)

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Table 4 Contributions of the models (r and R^2) for the prediction of the number of points and statistical coefficients (F and P) of the multiple linear regression analysis using the Stepwise method

Model	R	R^2	F	Significance
1	0,567	0,321	F1,362=171,5	P<0,001
2	0,719	0,517	F1,361=145,8	P<0,001
3	0,734	0,539	F1,360=17,6	P<0,001
4	0,749	0,561	F1,359=17,6	P<0,001
5	0,786	0,618	F1,358=53,5	P<0,001
6	0,793	0,629	F1,357=11,1	P<0,001

Legend: Model 1 - Percentage of 2-point shots; Model 2 - Percentage of 2-point shots + percentage of 3-point shots; Model 3 - Percentage of 2-point shots + percentage of 3-point shots + 2-point shots attempted; Model 4 - Percentage of 2-point shots + percentage of 3-point shots + 2-point shots attempted + 3-point shots attempted; Model 5 - Percentage of 2-point shots + percentage of 3-point shots + 2-point shots attempted + 3-point shots attempted + free throws attempted; Model 6 - Percentage of 2-point shots + percentage of 3-point shots + 2-point shots attempted + 3-point shots attempted + free throws attempted + percentage of free throws.

Table 5 Variables used for the development of the prediction model for the number of points, statistical coefficients, and prediction constants from the Stepwise method

Model	Variable	B	Constant	T	Significance	R
1	2 Pts %	1,19	44,59	13,09	P<0,001	0,567
2	2 Pts %	1,12	19,83	14,49	P<0,001	0,567
	3 Pts %	0,81	19,83	12,07	P<0,001	0,485
3	2 Pts %	1,17	-2,96	15,31	P<0,001	0,567
	3 Pts %	0,85	-2,96	12,81	P<0,001	0,485
	2 Pts Attempted	0,38	-2,96	4,20	P<0,001	-0,010
4	2 Pts %	1,19	-31,07	15,88	P<0,001	0,567
	3 Pts %	0,87	-31,07	13,47	P<0,001	0,485
	2 Pts Attempted	0,62	-31,07	5,86	P<0,001	-0,010
	3 Pts Attempted	0,47	-31,07	4,19	P<0,001	0,055
5	2 Pts %	1,17	-86,92	16,66	P<0,001	0,567
	3 Pts %	0,97	-86,92	15,65	P<0,001	0,485
	2 Pts Attempted	1,05	-86,92	9,14	P<0,001	-0,010
	3 Pts Attempted	0,91	-86,92	7,50	P<0,001	0,055
	FT Attempted	0,71	-86,92	7,32	P<0,001	0,105
6	2 Pts %	1,17	-102,78	16,91	P<0,001	0,056
	3 Pts %	0,95	-102,78	15,54	P<0,001	0,485
	2 Pts Attempted	1,09	-102,78	9,58	P<0,001	-0,010
	3 Pts Attempted	0,93	-102,78	7,73	P<0,001	0,055
	FT Attempted	0,73	-102,78	7,63	P<0,001	0,105
FT %	0,19	-102,78	3,33	P=0,001	0,135	

Multiple regression for all analyzed variables

The multiple regression analysis allowed for the prediction of team scoring based on all variables. The analysis performed using the Stepwise method revealed the following descending order of contribution to the regression: percentage of 2-point shots, percentage of 3-point shots, offensive rebounds, turnovers, free throw percentage, violations, and 3-point shots attempted (Table 6). This model was able to explain 63.2% of the variation in the number of points.

Table 6 Contributions of the models (r and R^2) for the prediction of the number of points and statistical coefficients (F and P) of the multiple linear regression analysis using the Stepwise method

Model	r	R^2	F	Significance
1	0,567	0,321	F1,362=171,5	P<0,001
2	0,719	0,517	F1,361=145,8	P<0,001
3	0,756	0,572	F1,360=46,2	P<0,001
4	0,781	0,610	F1,359=34,9	P<0,001
5	0,789	0,623	F1,358=12,7	P<0,001
6	0,792	0,628	F1,357=4,8	P=0,029
7	0,795	0,632	F1,356=4,3	P=0,039

Legend: Model 1 - Percentage of 2-point shots; Model 2 - Percentage of 2-point shots, percentage of 3-point shots; Model 3 - Percentage of 2-point shots, percentage of 3-point shots, Offensive Rebounds; Model 4 - Percentage of 2-point shots, percentage of 3-point shots, Offensive Rebounds, Turnovers; Model 5 - Percentage of 2-point shots, percentage of 3-point shots, Offensive Rebounds, Turnovers, Free Throw Percentage; Model 6 - Percentage of 2-point shots, percentage of 3-point shots, Offensive Rebounds, Turnovers, Free Throw Percentage, Violations; Model 7 - Percentage of 2-point shots, percentage of 3-point shots, Offensive Rebounds, Turnovers, Free Throw Percentage, Violations, 3-Point Shots Attempted.

Considering all the variables included in the multiple linear regression analysis, it was found that r=0.795 (R^2=0.632; F1,356=4.3; P=0.039) for the following prediction equation for the number of points (Table 7): Number of Points = 1.63 + 1.20 * (2Pts %) + 0.97 * (3Pts %) + 1.29 * (Defensive Rebounds) + (-1.01) * (Turnovers) + 0.20 * (Free Throw %) + (-0.74) * (Violations) + (-0.20) * (3Pts Attempted) (Equation 3)

Table 7 Variables used for the development of the prediction model for the number of points, statistical coefficients, and prediction constants from the Stepwise method

Model	Variable	B	Constant	T	Significance	R
1	2 Pts %	1,19	44,59	13,09	P<0,001	0,567
2	2 Pts%	1,12	19,83	14,49	P<0,001	0,567
	3 Pts%	0,81	19,83	12,07	P<0,001	0,485
3	2 Pts%	1,20	-1,49	16,24	P<0,001	0,567
	3 Pts %	0,93	-1,49	14,16	P<0,001	0,485
	Off. Rebound	1,03	-1,49	6,80	P<0,001	0,009
4	2 Pts%	1,20	6,59	17,08	P<0,001	0,567
	3 Pts %	0,97	6,59	15,42	P<0,001	0,485
	Off. Rebound	1,15	6,59	7,83	P<0,001	0,009
	Turnovers	-0,85	6,59	-5,91	P<0,001	-0,121
5	2 Pts%	1,20	-7,24	17,37	P<0,001	0,567
	3 Pts %	0,96	-7,24	15,37	P<0,001	0,485
	Off. Rebound	1,20	-7,24	8,29	P<0,001	0,009
	Turnovers	-0,90	-7,24	-6,31	P<0,001	-0,121
	FT %	0,20	-7,24	3,56	P<0,001	0,135
6	2 Pts%	1,19	-3,09	17,20	P<0,001	0,567
	3 Pts %	0,96	-3,09	15,49	P<0,001	0,485
	Off. Rebound	1,21	-3,09	8,37	P<0,001	0,009
	Turnovers	-0,95	-3,09	-6,62	P<0,001	-0,121
	FT %	0,19	-3,09	3,36	P=0,001	0,135
	Violations	-0,62	-3,09	-2,20	P=0,029	-0,101
7	2 Pts%	1,20	1,63	17,37	P<0,001	0,567
	3 Pts %	0,97	1,63	15,67	P<0,001	0,485
	Off. Rebounds	1,29	1,63	8,66	P<0,001	0,009
	Turnovers	-1,01	1,63	-6,91	P<0,001	-0,121
	FT %	0,20	1,63	3,52	P<0,001	0,135
	Violations	-0,74	1,63	-2,57	P=0,011	-0,101
	3 Pts Attempted	-0,20	1,63	-2,07	P=0,039	0,055

Citation: Okazaki VHA, Carvalho EMO. Key variables for predicting scoring success in Brazilian basketball games. *MOJ Sports Med.* 2024;7(3):90–95. DOI: 10.15406/mojsm.2024.07.00171

Discussion

The present study aimed to identify the technical fundamentals and game actions that best predict scored points. To this end, a multiple linear regression analysis was used, considering technical fundamentals and game actions under the following conditions:

(a) without shooting variables (number of attempts and shooting percentage),

(b) only with shooting technical variables, and

(c) with all fundamentals and technical actions together.

For organizational purposes, each of these analysis conditions was presented separately.

Prediction of points without considering shooting variables

Technical fundamentals and game actions, excluding shooting-related variables, were capable of predicting the number of points scored in the game. The prediction model included the following variables: assists, turnovers, defensive rebounds, and personal fouls received.

Assists were the first variable to enter the model, showing the greatest contribution to predicting team points. This result was expected, as this variable is related to success in the game[4,6,7,12] and an assist only occurs when a shot is made. Points scored through free throws would not be related to the number of assists. Therefore, teams should try to organize plays to create better conditions for shots through a higher number of assists. It is crucial for athletes to be trained both in performing basic dribbling and passing fundamentals and in perceptual aspects of tactical decision-making in the game. This approach allows for more assists, increasing the chance of scoring points in the game.

Turnovers were found to have an inverse relationship with the number of points scored. Interestingly, this variable contributed more to the multiple linear regression model than defensive rebounds. Even if teams have possession of the ball, they must be cautious not to lose it. Since a turnover results in the team losing the opportunity to score points and simultaneously gives the opposing team a chance, turnovers were also a variable that contributed to predicting team points.[9] Therefore, it is essential for coaches to develop players' efficiency in technical fundamentals and game actions to minimize errors during games.

Several authors have emphasized the importance of defensive rebounds in the game.[4–6,12,13] This fundamental ensures more ball possessions for a team to create more scoring opportunities. Moreover, each defensive rebound reduces the opposing team's chance to score points.[9] Thus, proper training for acquiring rebounds is of fundamental importance. Athletes should be capable of performing essential fundamentals for mastering this technique, such as appropriate body positioning to block opponents and timing the ball to secure the rebound.

Personal fouls received were also identified by the multiple linear regression model as a factor influencing points scored. Fouls can be a determining factor in the game, as they can generate new free throw opportunities. For example, fouls committed during a shot or after the fifth foul of a team grant the team that was fouled the right to perform free throws. Therefore, the more fouls a team receives, the more free throw opportunities it will have. Thus, it would be beneficial for teams to focus on driving to the basket and being more aggressive in their attacks during the game, as these factors can lead to more free throw opportunities and thus more chances to score points.

Despite the significant contribution of the model with these variables (assists, turnovers, defensive rebounds, and personal fouls received), it was able to explain only 30.5% of the variation in points scored. Therefore, it is also important to consider separate and combined analyses including shooting variables for better prediction of the number of points.

Prediction of points using only shooting variables

The regression analysis considering only shooting variables presented a model consisting of the following variables: percentage of 2-point shots, percentage of 3-point shots, 2-point shots attempted, 3-point shots attempted, free throws attempted, and free throw percentage. This model was able to explain 62.9% of the variation in the number of points.

The first variable to be included in the model was the percentage of 2-point shots. This result was expected as this variable is directly related to success in basketball.[4,5,15] Since 2-point shots are the most frequently attempted shots during games,[9] having a higher percentage in this type of shot provides a greater possibility of scoring points.

The percentage of 3-point shots showed less contribution to the multiple linear regression model compared to 2-point shots. This can be explained by the lower efficacy of this type of shot[16] as well as the fact that 3-point shots are less frequently attempted during games,[9,17] despite providing an extra point when successful.

The percentage of free throws showed the lowest contribution to the statistical model. Although free throws have the highest effectiveness among shooting attempts, they are performed less frequently during games compared to 2-point shots, for example.[9,17] What was most notable was that free throws attempted had a greater weight compared to free throw percentage. This was explained by the fact that the efficacy of free throws is very similar across games, regardless of the team performing them, making the number of times a team attempts free throws contribute more to predicting the number of points than the efficiency itself.

For the variables related to shot attempts, it was observed that 2-point shots have greater contribution to the statistical model compared to 3-point shots or free throws. Some studies by Ibañez et al.,[8,17,18] suggest that 2-point shots are the most frequently attempted, comprising over 50% of shots during a game, whereas 3-point shots account for 15 to 20% of shots, and free throws average over 20% of shots during a game. Therefore, 2-point shot attempts are more utilized and more effective for scoring points. 3-point shot attempts, despite being less frequent during the game, are more important due to the higher points they provide when converted. Free throws, while showing a good contribution relative to total shots attempted during the game, have less impact in the statistical model because they contribute fewer points per successful attempt (only 1 point).

Prediction of points using technical fundamentals and game actions

The multiple linear regression analysis, considering a model that included all technical fundamentals and game actions, showed the following variables with significant contributions to predicting the number of points: percentage of 2-point shots, percentage of 3-point shots, offensive rebounds, turnovers, percentage of free throws,

violations, and attempted 3-point shots. This model was able to explain 63.2% of the variation in the number of points and demonstrated that, when considering all analyzed variables, more technical fundamentals and game actions were included compared to the previous models.

The effectiveness of shots continued to be the determining factor for scoring. Specifically, the effectiveness of 2-point shots remained more important in predicting the number of points[3,4,5,15] compared to the effectiveness of 3-point shots. This supports the earlier explanations that 2-point shots are more frequently used and more effective compared to 3-point shots.

An interesting result was observed when offensive rebounds showed greater contribution to the model compared to defensive rebounds in the initial multiple linear regression analysis. This may be due to the greater dependence of offensive rebounds on shooting effectiveness. When an offensive rebound is obtained, the team has the chance to take another shot. In some situations, for example, the rebound happens close to the basket, allowing the player to have a better position for a higher probability of scoring. In contrast, acquiring a defensive rebound requires the team to structure a new offensive action, which does not necessarily guarantee a higher chance of scoring.

Turnovers also contributed negatively to the model. In addition, the variable violation was included in this model. Since a violation results in the team losing the opportunity to attempt a shot, this variable also negatively impacts the model. Furthermore, a violation results in the loss of possession and gives the opponent the opportunity to score. This variable likely did not appear in previous statistical analyses due to its low absolute frequency in games.

The percentage of free throw shots also featured in the regression model considering all analyzed variables. In this model, the greater contribution of this variable was explained by the fact that better effectiveness in free throws allows for higher scoring in the game. Therefore, as free throws represent approximately 20 to 30 percent of shots in a game,[8,17,18] ensuring excellent performance in this type of shot is crucial for scoring more points during the game.

Among the attempted shot variables, only 3-point shots appeared. This variable entered the model with a negative contribution. Consequently, a high number of 3-point shots attempted by a team might hinder its ability to score more points. This can be explained by the lower effectiveness of 3-point shots compared to 2-point shots and free throws.[9] The 3-point shot requires a high level of precision, making it more challenging to convert into a basket.[16] Thus, teams should aim for shots closer to the basket, reserving 3-point shots for specialists and specific game situations.

Limitations

This study was conducted only with male teams from professional Brazilian basketball. Future investigations are suggested with female teams and professional basketball teams from other countries. The analysis was limited to technical indicators and in-game actions. Further analyses of tactical actions and offensive and defensive systems that determine the number of points in basketball games are also recommended.

Conclusion

The prediction analysis of scoring, considering technical fundamentals and in-game actions without shooting variables, was based on the variables of assists, turnovers, defensive rebounds, and fouls received. When considering only the shooting-related variables, the prediction of scoring showed progressive contributions from the percentages of 3-point shots, 2-point shots, and free throws, as well as the attempted 3-point shots, 2-point shots, and free throws. When all technical variables and game actions were considered, the prediction of points included the percentage of 2-point and 3-point shots, offensive rebounds, turnovers, free throw percentage, violations, and attempted 3-point shots. This study can be used by coaches, players, and basketball managers in Brazil as a basis for understanding the fundamental factors for success in basketball, as it provides indicators of game effectiveness that can be utilized to modify individual athlete training and team preparation. Future studies could explore the influence of situational factors such as game context, player positions, and opponent strategies to deepen the understanding of scoring dynamics in basketball.

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Conflicts of interest

The author declares that there are no conflicts of interest.

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