

BURNOUT INVENTORY FOR REFEREES (BIR): PSYCHOMETRIC PROPERTIES FOR BRAZILIAN SOCCER REFEREES**INVENTÁRIO DE *BURNOUT* PARA ÁRBITROS (BIR): PROPRIEDADES PSICOMÉTRICAS PARA ÁRBITROS BRASILEIROS DE FUTEBOL**

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RESUMO

O objetivo do estudo é analisar as propriedades psicométricas do Inventário de *Burnout* para Árbitros (BIR) oferecendo evidências de validade do instrumento por meio da análise de sua estrutura interna, estimando indicadores de confiabilidade e comparando o escore total de *Burnout* em árbitros centrais e árbitros assistentes. Participaram 284 árbitros de futebol de seis Estados brasileiros. A idade média foi 31,3 anos ($\pm 6,1$), sendo 255 do sexo masculino (89,7 %) e tempo de experiência na arbitragem médio 6,9 anos ($\pm 5,5$ anos). O BIR consiste em um questionário de 9 itens, dispostos em uma escala *likert* de 7 pontos. O resultado da análise fatorial exploratória apontou para a presença de um fator que explicou 53,1% da variância dos dados. O ajuste do modelo Comparative Fit Index = 0,923 (IC de 95% 0,883-0,950) e Non-Normed Fit Index = 0,897 (IC de 95% 0,844- 0,933), indicam adequação do modelo de um fator único. Não houve diferença de *burnout* entre árbitros assistentes e centrais. O instrumento apresentou índice de confiabilidade ômega de McDonald = 0,823. Conclui-se que o BIR apresenta estrutura fatorial centrada na dimensão exaustão física e emocional, diferente do seu modelo inicialmente proposto, e de outros estudos realizados anteriormente com o instrumento.

Palavras-chave: Esgotamento profissional. Análise fatorial. Arbitros. Inventário de Burnout para árbitros.

ABSTRACT

The objective of the study is to analyze the psychometric measurements of the Burnout Inventory for Referees (BIR) offering validity evidence of the instrument through the analysis of its internal structure, estimating reliability indicators and comparing the total score of Burnout in referees and assistant referees. Participants were 284 soccer referees from six Brazilian states. The mean age was 31.3 years old (± 6.1), being 255 male participants (89.7%), and the average experience time of the referees was 6.9 years (± 5.5 years). The BIR consists of a questionnaire of 9 items, arranged on a 7 points *likert* scale. The result of the exploratory factor analysis pointed to one factor that explained 53.1% of the data variance. The Comparative Fit Index = 0.923 (95% CI 0.883-0.950) and Non-Normed Fit Index = 0.897 (95% CI 0.844-0.933) indicates suitability to a single-factor. There was no burnout difference between referees and assistant referees. The instrument presented a reliability index (McDonald's omega) of 0.823. It is concluded that the factor structure of BIR's version for Brazilian referees focuses on a single dimension that guided the development of the instrument. This result is also different from that found in other studies carried out previously using the instrument.

Keywords: Burnout. Validation Study. Soccer. Stress. Psychological.

Introduction

The referees are key characters in a soccer match. During a soccer game, their performance is associated with a load of important decisions, capable of affecting a competition result¹. For being a neutral character in the game dispute and, at the same time, having such a present performance, the soccer referee is constantly subjected to verbal and even physical aggression, besides constant judgments of his/her concerning any decision-making, what could make this job potentially stressful^{2,3}.

In the context of professional soccer it is possible to specialize in either referees or assistant referees. The duties differ in terms of the type of participation, decision-making, exposure in the field/media and physical wear during the match. The assistant referee has the duty of assisting the referee in his/her decisions, signaling offsides, corners, faults that happen

close to him/her and inappropriate behavior of coaches or members of the coaching staff⁴. On the other hand, the referees take over responsibility for the interpretation of the rule and the decisions made during the match, and may or may not accept the assistant referee's decisions. Although both groups participate in the same type of training and physical test, the referee tends to have greater physical wear during the soccer match, as he/she needs to closely watch the players in their movement on the field^{4,5}.

The working condition of the soccer referee's job involves the ability to manage, with quality, the frequent exposure to stressors, such as dealing with crowd pressure, blamed for error, press harassment, emotional uncontrolled coaches/athletes⁵. These environmental factors can be related to the level of satisfaction and motivation at work, triggering negative emotions in the work activity, increasing the levels of stress, irritability and tension, decreasing their level of attention, concentration and memory⁶. Furthermore, these factors increase the trend for mood changes, which, added to individual factors, such as the referee's personality characteristics, are related to the onset of psychopathological conditions, such as chronic stress, anxiety and depression^{7,8}. In Brazil, the requirement to prove an employment bond outside arbitration and the fact that there is no regulation of the profession, increase the work overload, besides to the constant competition that requires a greater number of annual tests to keep or achieve better results in arbitration positions^{4,9}. The referee's exposure to this constant stressing environment can lead him/her to develop the exhaustion syndrome or burnout^{9,10}.

Burnout was initially conceptualized by Freudenberguer as a process arising from excessive demands of work, pressure and strongly associated with human relationships¹¹. Maslach and Jackson¹² created the first instrument, composed of 47 items, to evaluate burnout in professionals who provide care to other people, such as nurses, doctors, social workers and teachers. For the instrument construction, the authors started from the hypothesis that excessive work demands, other than generating emotional exhaustion feelings, leads to a reduction in the quality of work offered by the professional. This theory was raised from exploratory studies using observations and interviews¹². In the process of analyzing the internal structure, the instrument had three factors: "emotional exhaustion", related to the feeling of lack of energy to deal with stressors; "Depersonalization", characterized as the reduction of concern with job performance, becoming cold and insensitive with others; and "professional achievement", related to appreciation and satisfaction about professional growth. It was, therefore, the factor solution found for this version of the instrument that favored the development of a multidimensional theory of burnout.

Raedeke and Smith¹³ improved the concept of burnout for the sports context, based on the multidimensional theory¹² being expressed in the dimensions of physical and emotional exhaustion, reduced sense of sports achievement and depersonalization. In the multidimensional sport adapted model by Raedeke and Smith¹³, the dimension of personal achievement, was nominated as a reduced sense of sports achievement, and is concerned with dissatisfaction with sports performance and the perception of little success in their professional activity. The physical and emotional exhaustion dimension was presumed in the sports context as psychophysiological responses related to stress arising from high demands for training and competitions, which can compromise the physical, psychological and social well-being of individuals involved with sport¹⁴. On the other hand the sport devaluation dimension is characterized by indifference towards sports practice, that is, when the athlete no longer cares about his/her performance, when the sport loses its value to the athlete^{12,14,15}.

In the sports context, an analysis of the Brazilian referees showed that a percentage close to 40% of the referees had a high incidence of burnout during a sports season, characterized as a group especially predisposed to express it¹⁶. The consequences of burnout for referees involve an increase in negative emotions and feelings that can compromise mental

health and consequent career desertion^{9,17}. According to Dell, Rhind and Misia¹⁷, the number of professional soccer referees in the United Kingdom has been decreasing in the recent years, and the authors point this reduction to the difficulty that the referee has in implementing adaptive coping strategies to deal with career stress, finding in the modality's abandonment, the exit for the recovery of his/her well-being and mental health.

Despite the high rates pointing to the risk of these professionals expressing burnout, most studies in the Brazilian and international sports domains have investigated the behavior of this syndrome in athletes or coaches^{18,19}. In these past years, despite having a considerable increase in the number of studies on the sports burnout context, most were developed with samples of athletes, being the studies with referees still scarce^{20,21}. Besides the small number of studies on referees, the evaluation of burnout in this public is carried out with instruments for the general population or developed for athletes. In his study, Almeida²² reviewed 18 articles on Burnout on referees, of which only 5 used a specific instrument for referees. Most of them used the Maslach Burnout Inventory validated for the general population and the Athlete Questionnaire Burnout, validated for the athlete.

In the Brazilian context, only one specific burnout instrument for referees has evidence of validity. Brandão, Serpa, Rosado and Weinberg²³ adapted the Burnout Inventory for Referees (BIR) to Portuguese (European and Brazilian), originally developed by Weinberg, Richardson²⁴. The original BIR study²⁴ does not describe in detail the steps involved in its construction, nor the subsequent studies to survey its psychometric properties. Therefore, little is known about the original version of the instrument. Furthermore, it is not shown, in solid detail, the theoretical model that underlies the construction of the items and which is the validity evidence achieved for the instrument in its original version. Despite this limitation in the description of the instrument construction process in English, the confirmatory factor analysis carried out in the adaptation and validation study, by Brandão and collaborators²³, confirms the multidimensional model of burnout reported in the literature for athletes^{12,15}.

Despite the multidimensional model presenting acceptable adjustment indexes, reported in the BIR validation process²³, it presents discrepancies as to the number of factors and the interdependence relationship among them¹⁹. This occurs both in the general context, using the Maslach Burnout Inventory (MIB)^{25,26}, and in the sports context, using the Questionnaire Burnout Athletes (ABQ)^{23,26}. Gustafson²⁷ in his review of burnout models in athletes reflects upon the theoretical model of burnout for athletes, highlighting the centrality of the physical and emotional exhaustion dimension, instead of the existence of independency among the three dimensions. However, there are no studies that assess the factorial solution of the Burnout Inventory for Referees (BIR) in an exclusively Brazilian sample. The other studies with the Burnout Inventory for Referees for the Brazilian context did not aim to raise the psychometric properties of the instrument^{26,28}.

Considering the lack of consensus in the literature regarding the burnout dimensions, both in the general context and in the sports context, and the absence of validation studies of the BIR in an exclusively Brazilian sample, the objective of the present study was to analyze the psychometric properties of the Burnout Inventory for Referees (BIR) adapted by Brandão et al.²³, especially by providing evidence of the instrument's validity by analyzing its internal structure and estimating reliability indicators. Furthermore, it was also intended to define the levels of burnout in referees and assistant referees.

Methods

Participants

A total of 284 soccer referees (144 referees and 140 assistant referees) from six Brazilian states participated in the study, 41% of the participants were from the state of Minas Gerais, with ages ranging from 18 to 46 years old ($M = 31.3$ years old; $SD = 6.1$), 255 of whom were male (89.7% of the sample). The mean length of experience in arbitration was 6.9 years ($SD=5.5$ years), with a minimum of six months and a maximum of 22 years. Table 1 shows the description of the sample according to the state affiliation, education and socio-economic level. The socio-economic classification was calculated based on the parameters of the 2015 Brazil Criterion (buying power, education level, access to clean drinking water and paved streets in the neighborhood).

Table 1. Sample distribution according to socio-economic class, state and level of education (N= 284)

	Affiliated States			Socio-economic Level			Education				
	R	AR	%	R	AR	%	R	AR	%		
MG	55	53	34.1	Class A	12	16	10.1	Elementary	4	3	2.4
CE	32	29	23.6	Class B	27	25	18.7	High School	51	41	32.7
DF	7	8	5.8	Class B2	52	55	38.6	Higher Education	70	77	52.3
MA	8	11	7.3	Class C1	37	29	23.8	Grduate School	16	1	12.4
PE	21	12	12.7	Class C2	11	13	8.6				
PI	11	11	8,5								
Total	134	124		Total	139	138		Total	141	140	

Note: R = Referee; AR = Assistant Referee

Source: Authors

Instruments

The Burnout Inventory for Referees (BIR): originally translated into Portuguese by Brandão et al.²³ consists of a 9-item questionnaire, arranged on a 7-point likert scale, being 1 point not very intense and 7 points very intense. The minimum score is 9 and the maximum is 63 points. The adapted instrument does not have reference values for the classification of burnout. For the analysis of the referees' burnout levels, a classification was proposed in low, moderate and high levels of feelings frequency related to the syndrome, following the recommendations established by Maslach and Jackson¹¹. Thus, in the present study, the classification levels for the frequency of feelings associated with burnout in referees were calculated from the gross scores, converted into standardized scores for the calculation of the terciles (lower tercile; middle tercile; upper tercile), according to the recommendations of Dancy and Reidy²⁹. The items contemplate the three dimensions of the syndrome in the sports context: physical and emotional exhaustion (eg item 1: I feel exhausted after refereeing, item 2: I feel tired when I get up in the morning and have to face a task related to refereeing, item 8: I am completely exhausted after refereeing a game); a reduced sense of sporting accomplishment (eg item 5: I feel frustrated with the refereeing, item 6: I feel tired of refereeing, item 9: I feel I came up to my limit), and sport devaluation (eg, item 3 working with coaches and athletes is a burden for me, item 4 concerns me about the fact that refereeing is becoming emotionally colder, item 7 I became more indifferent with people after starting refereeing). The results are obtained from the sum of the given answers, with higher total scores indicating high levels of burnout. The composite reliability index for the Physical and Emotional Exhaustion dimension = 0.86, for the Depersonalization dimension = 0.65 and for Reduced Sense of Achievement = 0.74.

Sociodemographic Questionnaire: it was created specifically for the present study and aims to characterize the participant, concerning social, economic and professional aspects. Composed of 16 questions that are divided into identification, marital status, education and profession, economic classification based on the 2015 Brazil Criterion (Brazilian Association of Research Companies - ABEP) and aspects related to arbitration, Socio-Economic Class, Affiliate States, Level such as: years of experience, physical tests performed, approvals/fails, frequency of weekly physical training, physical training location, main competitions participated in and reasons for joining the arbitration.

Procedures

The project was approved by the Ethics Committee of the Universidade Federal of Minas Gerais (CAAE 53351216.4.0000.5149). All participants signed the Informed Consent Form (ICF). The choice by the participating states was made by convenience, based on the availability criteria of a qualified psychology professional, who works directly as a sports psychologist in each of these Federations, who allowed the access and consent of the management of the local arbitration committee and offered to apply the instruments. Therefore, six psychologists, one in each state, were responsible for the application of the research protocol. Referees are members of their state's football federation.

The instruments were sent to psychologists, along with a document with information about the research and application instructions that took place at the headquarters of the local federations. Online training was given to the psychologists' team to answer questions and clarify application procedures. The study is part of a larger research project that aimed to survey the psychological profile of Brazilian referees, which were evaluated personality characteristics, coping strategies, motivation and psychological adjustment of the referees. Data collection was carried out in the years 2016 and 2017.

The applications of the instruments were carried out collectively and lasted about 1 hour and 30 minutes, in all states. Soon after the applications, all the material was returned, by the psychologists responsible for collection in each state.

Statistical analysis

An exploratory factor analysis was carried out to verify the instrument's internal structure³⁰, since there is no consensus in the literature on the structure of burnout, as presented throughout the introduction. Thus, it was opted for exploratory factor analysis with an estimation of adjustment parameters, to verify the factorial solution found in the Burnout Inventory for Arbitrators (BIR).

The exploratory factor analysis, model adjustment and internal consistency analysis were performed using the FACTOR software³¹, Windows 10 version. The Mardia-Test for Multivariate Normality was carried out to explore the characteristics of the distribution of BIR scores.

The factor retention was performed using the Horn Parallel Analysis method, a statistical simulation procedure that takes place through the creation of a hypothetical set of the correlation matrix, with the same number of variables and the same number of subjects in the data set under analysis³⁰. In this procedure, the Optimal Implementation option, which uses the explained variance among the factors as a comparison criterion instead of eigenvalues from Horn's Classical Parallel Analysis. The Diagonally Weighted Least Squares (DWLS) method was used for the extraction of factors, as it is a method that does not require normal data distribution and is more recommended when the data are more to an ordinal nature, such as on a likert scale^{30,32}. The parameters are estimated using weighted least squares. This method performs better when there are problems with the sample size or other orientation in the standard error³³. The estimation method uses polychoric correlations, which

do not assume linear relations like Pearson's correlations, shown in traditional methods such as Maximum Likelihood (ML)³⁴. This option also generates adjustment adequacy indexes, the Comparative Fit Index and Non-Normed Fit Index, for the chosen model, values above 0.90 or 0.95 are generally considered acceptable, although without absolute consensus³². The rotation method used was Promin, commonly used in the literature, when it is assumed that an item can carry more than one factor. The software displays McDonald's Omega values that relate to the reliability of factors for the scale as a whole. McDonald's Omega is the recommended reliability estimator when data are ordinal and the correlations among the polychoric type items³⁵, values above 0.7 are considered acceptable^{32,35}.

To compare the referees by function based on the factorial structure of the questionnaire, SPSS version 21 software was used. Demographic data concerning the function in the arbitration were analyzed using descriptive statistics. The Mann-Whitney test was used to compare burnout scores among referees and assistant referees.

Results

The Mardia-Test for Multivariate Normality showed that the data do not follow a multivariate normal distribution ($p < 0.05$), so the polychoric correlation is recommended. The Kaiser-Meyer-Olkin (KMO) criteria, or sample adequacy index was verified, and Bartlett's Sphericity Test for adequacy of the correlation matrix model, aiming to confirm whether the data matrix was susceptible to factorization³⁰. Values found for Bartlett = 728.9 ($df = 36$; $p < 0.001$) and values found for Kaiser-Meyer-Olkin (KMO) = 0.69815, (95% CI = 0.656-0.766), KMO values above 0,5 are considered acceptable^{30,31}.

Horn's parallel analysis with bootstrapping for 500 samples, an analysis used for factor retention, indicated a unifactorial model, a different solution from that proposed by the theoretical model that considers burnout to be a 3-factor multidimensional construction. In this method, it is retained only the factors with real data variance percentage greater than the mean percentage of the hypothetical data variance, an improved method when compared to the eigenvalues from Horn's Classical Parallel Analysis³⁵. The retained factor explains 53.1% of the data variance. After this result, a new analysis was performed considering the number of factors indicated by Horn's parallel analysis. The indexes Unidimensional Congruence (UniCo) and Mean of item Residual Absolute Loadings (MIREAL) provide information about how safe it is to say that the instrument is one-dimensional. The values of UniCo = 0.94 (95% CI 0.921-0.969) and MIREAL = 0.30 (95% CI 0.252-0.336) indicates to the instrument's unidimensionality. UniCo values > 0.95 and MIREAL < 0.30, are considered acceptable as a sign of unidimensionality³⁶.

Regarding the adjustment of the model, the CFI and NNFI indexes were used, which compare the extracted model to a base model. It was obtained a Comparative Fit Index = 0.923 (95% CI 0.883-0.950) and Non-Normed Fit Index = 0.897 (95% CI 0.844-0.933), both indicating the adequacy of the single-factor model. Values above 0.9 are considered acceptable³⁵. The replicability of the factorial structure of this study in other studies was estimated using the H-Observed index, the most appropriate when using likert scales³⁰. Values above 0.8 are considered acceptable³⁵. In this study, an H-Observed index = 1.005 was found, indicating that the factorial structure found is replicable in other studies.

Table 2 shows the factorial load of the items by the factor. All factorial loads were above the limit considered acceptable³¹ of 0.30. Items 1, 6 and 9 (ex: I feel exhausted after arbitrating; I feel tired of arbitration; I feel that I am reaching my limit, respectively) presented higher factor loads, carrying more of the factor. Items 3 and 4 (Working with coaches and athletes is a burden for me; I am concerned that refereeing is making me emotionally colder, respectively) presented lower factor loads.

Table 2. Factorial loading of items by a factor of the Burnout Inventory for Arbitrators (BIR)

Item	Factor 1	Confidence Interval 95%
1	0.874	(0.816 0.910)
2	0.517	(0.404 0.629)
3	0.386	(0.241 0.530)
4	0.420	(0.258 0.554)
5	0.515	(0.392 0.625)
6	0.722	(0.615 0.817)
7	0.420	(0.276 0.552)
8	0.920	(0.878 0.950)
9	0.651	(0.547 0.725)

Source: Authors

The instrument's reliability indexes calculated using McDonald's Omega were 0.823, and values above 0.7 are considered acceptable in the literature³⁵. It has been chosen to calculate the reliability of the entire scale because it is a one-dimensional instrument, as pointed out by the results of the exploratory factor analysis.

Based on the factorial solution found, the analysis of the comparison of the questionnaire's total score between referees and assistant referees was performed. The Mann-Whitney group comparison test showed a $U = 8835$ ($p=0.1$) value. The results indicate that there is no statistically significant difference in the total scores between referees and assistant referees in this sample, as expected, confirming the study by Pedrosa⁹ using the same questionnaire.

The rating levels for the frequency of feelings related to burnout in referees were calculated from the gross scores (which ranged from 9 to 47 points in the BIR) converted into standardized scores, from which they were divided into tercile (lower tercile; middle tercile; upper tercile). Thus, for the purposes classification of burnout in referees, a BIR score of up to 14 points was considered low, moderate, from 15 to 24 points, and high above 24 points. As shown in Table 3, 46.8% of the referees had a high burnout, 35.9% of them had a moderate level of burnout and 17.3% of them had a low level. As for assistant referees, 42.9% had high levels of burnout, 32.8% of them had a moderate level and 24.3% had a low level.

Table 3. Descriptive statistics regarding the rating of the referees' burnout levels, using the BIR

Function	Classification	%	Median	Mean	SD
Referee	Low	17.3	19	20.32	7.3
	Moderate	35.9			
	High	46.8			
Assistant Referee	Low	24.3	18	18.89	6.83
	Moderate	32.8			
	High	42.9			

Source: Authors

Discussion

The study's main objective was to verify the factorial structure of the BIR for a sample of exclusively Brazilian referees, through exploratory factor analysis. The instrument's internal structure was verified to be different from that found in the version proposed by Brandão et al.²³. The original version, by Weinberg and Richardson²⁴, was built based on the multidimensional theory corresponding to the Raedeke and Smith model¹³ that explains burnout in sport. However, after testing the version on an exclusive sample of Brazilian referees, through exploratory factor analysis, this instrument led to a single factor structure.

The factorial inconsistency found in the BIR matches the results of studies with other questionnaires that evaluate burnout, built based on the three-dimensional model¹², such as the Athlete Burnout Questionnaire (ABQ)²⁶ and the Maslach Burnout Inventory (MBI)^{25,37}. This suggests, from a theoretical point of view, possible inconsistencies in the definition and operationalization of the construct.

When developing the Maslach Burnout Inventory (MBI), Maslach and Jackson¹² suggest that the three scales are interpreted independently, without providing further explanations, however, for the reasons why the three scales are part of the same construct^{27,38}. Gustafsson and collaborators²⁷ highlights that there is a certain consensus among researchers about the independence among the three factors and the centrality of the physical and emotional exhaustion dimension. According to the authors, this dimension presents greater discriminative power when burnout is studied from a clinical point of view in work environments. Thus, considering the results of the factorial analysis of this study, the interpretation of burnout for the referees' population tends a syndrome essentially associated with the physical and emotional exhaustion factor.

From the theoretical and conceptual understanding of burnout^{27,39}, the necessity to understand the previous and consequent relationships among the three dimensions is emphasized, suggesting that physical and emotional exhaustion may precede the dimensions of reduced sense of sports achievement and depersonalization. This chronologic difference among symptoms could make their connections impossible as dimensions of the same construct. According to these authors, most studies use cross-sectional designs, making it difficult to properly investigate the chronologic relationship among the three proposed dimensions. Future longitudinal studies are needed to understand the chronologic relationship among the dimensions of burnout.

In the present study, there was no difference in the total burnout scores in referees and assistant referees. The result confirms that found by Pedrosa⁹ using the same questionnaire. The authors explain that referees and assistant referees work in the same context, despite performing different functions, the general context seems to have a greater influence on the syndrome onset. From the physical and emotional exhaustion point of view, despite the role of referee presenting greater physical demand during the match, both groups participate in the same training and physical fitness test in their federations, proving to be a little relevant factor for the burnout perception.

Furthermore, it was observed that approximately 44% of the total sample of referees had a high burnout rate. In the soccer context, a popular and mass media sport in Brazil, the referee's performance is constantly evaluated, with criticism and responsibility for the results. The referee is often exposed to a hostile environment, with verbal aggression and threats from athletes, technical commissions, fans and sports officials. The appreciation of the sport in the country puts the referee's decisions in evidence, increasing the burden of pressure for his/her decisions and social punishment for the mistake^{9,16}. Another possible explanation for this finding is the lack of regulation of the profession in Brazil, which does not provide a permanent salary, which often forces the soccer referee to conciliate the arbitration task with another profession, contributing to physical and emotional exhaustion¹⁰.

In his study with leading soccer and swimming referees, Pedrosa⁹ points to professional valorization as the main variable for the onset of burnout, compared with social support and variables called by the author as personal, namely: self-esteem, anxiety and depression. A qualitative-descriptive study Brandão et al.⁴ emphasize that the intrinsic motivation related to the arbitration tasks is a determining factor for preserving the referee career. However, for a significant portion, arbitration is a means of living, although the profession is not regulated in Brazil. Besides, pressure for performance, with constant tests

required by the federations, so that the referee remains in the profession, may promote the onset of burnout⁴.

Similar results were found in Costa Rican referees⁴⁰, where 27% of the referees were at high risk or already had burnout syndrome. Also, statistically significant correlations were found among the scores on the burnout scale and factors such as depressive symptoms ($r=0.61$), hostility perception ($r=0.31$), fatigue ($r=0.5$) and lack of social support ($r=0.39$). Regarding the referees' years of experience, the authors found no statistically significant correlations with burnout, suggesting that factors such as work overload, hostility perception and lack of institutional support are crucial to the perception of professional exhaustion. However, in this study, a non-specific scale is used for the referees' population.

This study has limitations, one of which is not having carried out validity studies with other variables correlated, in the literature, with the physical and emotional exhaustion dimension of burnout, as perceived stress^{41,42}, motivation⁴³, mood states^{44,45}. Another limitation of the study was not to control the timing of the season or the frequency of referees' games, considering that these contextual variables could affect the referees' burnout scores. Also, it was a convenience sample, both of the federation and the participants' choice, for example, there are no referees from the federations in the southern region of the country and states with great relevance for soccer, as for the number of active professionals, such as Rio de Janeiro and São Paulo. This reduces the possibility of generalizing the results found. Furthermore, it was not possible to carry out multigroup confirmatory analyzes to raise indicators of metric, configural and scalar invariance of the BIR for referees and assistants. This type of analysis is extremely important when the objective is to compare the mean scores of different groups in the applied instruments to guarantee equivalence in these comparisons when estimating the existence of a factorial structure common to the groups compared. In the present study, this analysis was not possible, since the sample sizes of the two groups compared (referees and assistants) were not enough to perform multigroup analyzes⁴⁶.

Conclusions

The revised Burnout Inventory for Referees (BIR) for the Brazilian referees presented a one-dimensional factorial structure, with 9 items. Despite differing from the original version of Weinberg and Richardson²⁴ and the version adapted for the Portuguese language by Brandão and collaborators²³, the instrument presented acceptable structural and reliability indexes for its application in the context of Brazilian soccer refereeing.

Thus, it is understood that the expression of the latent construct would be different in the adaptation and validation study of the BIR²³, which could demand the adaptation and even creation of new items, more representative of the Brazilian cultural scene³². In this study, there was a significance of the physical and emotional exhaustion dimension, different from the results presented by the validation and adaptation study of the Burnout Inventory for Referees (BIR), carried out by Brandão et al.²³.

The validation processes of adapted instruments, it is expected to find a structure similar to the original proposal^{32,36}. When there are discrepancies, these can affect the understanding of the construct to be evaluated. Therefore, when using the BIR in the evaluation context, it is understood that its scores relate to physical and emotional exhaustion. When choosing to evaluate referees through the BIR, it is suggested that the professional has as a theoretical conception that the physical and emotional exhaustion dimension is the central dimension of burnout, as previously discussed^{27,37,38}.

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