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Original Article

DO SPORT EXPERIENCES PREDICT BASIC PSYCHOLOGICAL NEED SATISFACTION AND FRUSTRATION IN ATHLETES?

EXPERIÊNCIAS ESPORTIVAS PREDIZEM A SATISFAÇÃO E FRUSTRAÇÃO DAS NECESSIDADES PSICOLÓGICAS BÁSICAS EM ATLETAS?

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RESUMO

O objetivo desse estudo transversal foi analisar o papel preditor das experiências esportivas sobre a satisfação e a frustração das necessidades psicológicas básicas de atletas universitários. Participaram 135 atletas de ambos os sexos (120 homens e 15 mulheres) praticantes das seguintes modalidades: futsal (n=39); handebol (n=15); vôlei (n=24); basquetebol (n=41) e Tênis de mesa (n=16). Foram utilizados os seguintes instrumentos: The *University Sport Experience Survey* e o *Psychological Need States in Sports* (PNSS-S). A análise dos dados foi conduzida por meio dos testes de *Kolmogorov-Smirnov*, Correlação de Pearson e Regressão Linear Múltipla ($p<0,05$). Os principais achados demonstram que habilidades básicas apresentou predição positiva sobre a satisfação de autonomia ($\beta=0,34$; $p<.05$), as habilidades sociais apresentaram predição positiva sobre a satisfação de competência e relacionamento ($\beta=0,52$ e 33; $p<.05$, respectivamente). Comportamento inapropriado apresentou predição positiva sobre a frustação de autonomia, competência e relacionamento ($\beta=0,38$, 0,37 e 0,37; $p<.05$ respectivamente). Concluiu-se que as experiências esportivas de habilidades básicas e sociais podem exercer um papel na satisfação das necessidades psicológicas básicas de atletas, enquanto o comportamento inapropriado pode favorecer a frustação de todas as necessidades psicológicas básicas (autonomia, competência e relacionamento) em atletas universitários

Palavras-chave: Experiências esportivas; Necessidades psicológicas básicas; Atleta Universitário.

ABSTRACT

This study analyzed the predictive role of sport experiences on satisfaction and frustration of basic psychological needs among college athletes. A total of 135 athletes participated. Two instruments were used: University Sport Experience Survey and Psychological Need States in Sports. Kolmogorov-Smirnov, Pearson's correlation, and Multiple Linear Regression tests ($p<0.05$) were used in data analysis. Results: basic skills had a positive prediction on autonomy satisfaction ($\beta=0.34$; $p<.05$), social skills had a positive prediction on competence and relatedness satisfaction ($\beta=0.52$ and 33; $p<.05$). Inappropriate behavior a positive prediction on autonomy, competence and relatedness frustration ($\beta=0.38$, 0.37 and 0.37). In conclusion sport experiences concerning basic and social skills play predictive role in satisfying the basic psychological needs, whereas inappropriate behavior can favor the frustration of all basic psychological needs athletes.

Keywords: Sport experiences; Basic psychological needs; College athletes.

Introduction

In the context of university sports, athletes face a series of challenges related to social, cultural and individual aspects when trying to balance their sporting and academic trajectories[1,2]. This dual demand frequently results in increased pressure, time constraints, and heightened performance expectations, which makes the motivational dynamics of university athletes particularly complex. Given this specificity, studies emphasize the need to better understand which psychosocial factors contribute to athletes' persistence, well-being, and performance in higher education environments[3-6].

Rather than focusing solely on the general benefits of sports participation, recent evidence highlights that the quality of sport experiences plays a more decisive role in shaping athletes' motivation and psychological functioning[7,8]. Positive experiences—such as supportive relationships, opportunities for skill development, and autonomy-supportive climates—are

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associated with healthier psychological adjustment[9-12], whereas negative experiences, including excessive pressure, interpersonal conflicts, or perceptions of incompetence, have been linked to emotional exhaustion, dropout intentions, and risky behaviors[13-17]. This shift from merely quantifying participation to examining the nature of sport experiences is particularly relevant in university sports, where athletes must navigate both academic and athletic demands simultaneously[18,19].

In this context, previous studies have emphasized the importance of identifying factors that foster motivation in college athletes as a means of supporting both academic and athletic achievement[3-6]. University student-athletes face unique developmental and organizational challenges, particularly those related to balancing sport and academics—often referred to as the "dual career" pathway—which can significantly affect their motivation and psychological functioning[1,2]. Motivation is widely recognized as a key psychological characteristic that sustains individuals' engagement and persistence in sport activities[20,21]. A particularly robust theoretical framework for understanding motivational processes in this population is Self-Determination Theory (SDT)[22], a comprehensive macro-theory of human motivation, development, and well-being. SDT posits that individuals' motivational quality exists along a continuum ranging from amotivation to controlled forms of motivation and, ultimately, to autonomous motivation. Progression along this continuum depends largely on the degree to which the social environment supports or thwarts the satisfaction of Basic Psychological Needs (BPN)[22].

The three BPN—autonomy, competence, and relatedness—are considered essential psychological nutrients for optimal functioning. Autonomy involves experiencing volition and psychological freedom in one's actions; when frustrated, individuals tend to feel pressured, coerced, or controlled[20]. Competence reflects the perception of effectiveness and capability while interacting with the environment; when thwarted, it elicits feelings of failure, inefficacy, and low confidence. Relatedness denotes feeling connected, respected, and valued by others; its frustration is marked by experiences of isolation or exclusion[20,22]. Importantly, research increasingly shows that need satisfaction and need frustration are not opposite ends of a continuum but distinct psychological processes, each associated with different patterns of well-being and maladjustment[10,20]. Empirical studies in sport settings have reinforced that supportive environments—characterized by autonomy-supportive coaching, constructive feedback, and positive interpersonal interactions—are linked to greater satisfaction of the three needs, whereas controlling or stressful sport experiences tend to promote need frustration, undermining motivation and well-being[20, 23].

Within university sport programs, the satisfaction or frustration of these needs tends to be directly influenced by the quality of athletes' interactions with coaches, teammates, and institutional structures. University athletes frequently navigate dual roles—athletic and academic—which intensify their exposure to environments that may simultaneously support and thwart their needs[24]. Autonomy-supportive coaching, opportunities for meaningful decision-making, constructive feedback, and a cooperative team climate have been shown to promote more self-determined motivation, greater well-being, and sustained engagement in sports. Conversely, environments marked by excessive performance pressure, controlling coaching behaviors, limited athlete voice, or institutional constraints (e.g., inflexible academic schedules, lack of resources) can foster need frustration, contributing to burnout, dropout intention, and maladaptive outcomes[20-22]. These characteristics make SDT a particularly relevant theoretical lens for understanding motivational dynamics among university athletes, whose experiences are shaped by complex social and organizational demands.

Although studies that observe sporting experiences and basic psychological needs are emerging, Melo et al.[23] observed, in Brazilian university athletes, that the basic psychological needs combined, that is, relatedness, competence and autonomy satisfaction, together and

separately, were related to the development of sport experiences through life skills. However, existing research is still limited in scope, often focusing on need satisfaction without simultaneously examining need frustration, or analyzing sport experiences only descriptively rather than as predictors of motivational functioning. Moreover, very few studies have tested these relationships specifically among university athletes, whose sport experiences are shaped by the unique academic–athletic interface.

Additionally, in the Brazilian context, university sports differ substantially from those in North America and Europe due to variations in institutional support, financial resources, and the developmental function of collegiate athletics. Despite these contextual particularities, empirical evidence exploring how Brazilian university sport environments promote or hinder BPN satisfaction and frustration remains scarce, which reinforces the importance of conducting studies in this setting[12,19,25].

Therefore, understanding how the university sports context affects the variables is extremely important to seeking greater development for these athletes. By examining how sport experiences predict both satisfaction and frustration of basic psychological needs in Brazilian university athletes, the present study contributes conceptually by integrating SDT with the sport experiences framework, and methodologically by addressing a gap in a population still understudied in the international literature. In view of the above, the present study aimed to analyze the predictive role of college athletes' sport experiences with satisfaction and frustration of basic psychological needs.

Methods

Design of study

This observational study has a cross-sectional design and is quantitative in nature. It was developed and structured through the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for observational research.

Participants

College athletes of both sexes, participating in the 2023 Pernambuco University Games, were invited to join this research. They were recruited in the qualifying phase of Pernambuco for the Brazilian University Games. Participants were selected non-probabilistically and by convenience. The inclusion criteria for this study were: 1) Being at least 18 years old; 2) Being playing the sport for at least three months; and 3) Being registered in the Pernambuco University Games as an athlete. In its turn, the exclusion criterion established was the athlete not having answered at least one of the questionnaires. Only those who signed the Free and Informed Consent Form (FICF) participated in the research.

Instruments

The sociodemographic questionnaire was developed by the researchers themselves; it contained information about age, sex, length of practice, main modality, and hours of training per week.

To measure university sport experiences, the University Sport Experiences Scale - Portuguese (USES-BR) was used, developed by Rathwell & Young[26] and validated for the Brazilian context[27]. The scale is composed of 39 items aimed at measuring sport experiences based on eight dimensions: initiative (e.g. "I am more committed"); basic skills (e.g., "I believe I have improved my creative skills"); interpersonal relationships (e.g., "I value other people's social contexts more"); social skills and teamwork (e.g., "I am better at supporting others"); adult network and social capital (e.g., "I feel more supported by the off-campus community"); stress (e.g., "I am often stressed"); social exclusion (e.g., "I often feel left out") and

inappropriate social behavior (e.g., "I am often exposed to leaders who look down on me.") The participants responded to a 7-point Likert-type ascending scale: 1 (Totally Disagree), 2 (Disagree), 3 (Somewhat Disagree), 4 (Uncertain), 5 (Somewhat Agree), 6 (Agree), 7 (Totally Agree). Cronbach's alpha values for the eight dimensions were: initiative ($\alpha = 0.89$), basic skills ($\alpha = 0.81$), interpersonal relationships ($\alpha = 0.85$), social skills ($\alpha = 0.88$), adult network ($\alpha = 0.83$), stress ($\alpha = 0.87$), social exclusion ($\alpha = 0.83$) and inappropriate behavior ($\alpha = 0.91$), considered excellent[28].

The Psychological Need States in Sports (PNSS-S) was developed by Bhavsar et al.[29] and validated for the Brazilian context by Freire et al.[30]. The PNSS-SB assesses the perceptions of psychological need states of athletes, both youths and adults. The scale contains 26 items distributed across six dimensions: satisfaction with autonomy (e.g., "I have a say in how things are done"), frustration with autonomy (e.g., "I feel excessive pressure"), satisfaction with competence (e.g., "I feel confident that I can perform well"), frustration with competence (e.g., "I feel incapable"), relatedness satisfaction (e.g., "I like the people around me") and relatedness frustration (e.g., "I feel excluded"). All items refer to either the satisfaction of three psychological need states or the frustration of three psychological need states. Responses are provided on a 7-point Likert-type ascending scale: 1 and 2 (Strongly Disagree), 3 to 5 (Neither Agree nor Disagree), 6 and 7 (Strongly Agree). Higher scores reflect stronger perceptions of satisfaction or frustration of the three basic psychological needs. Cronbach's alpha values for the six dimensions were: autonomy satisfaction ($\alpha = 0.86$), autonomy frustration ($\alpha = 0.90$), competence satisfaction ($\alpha = 0.88$), competence frustration ($\alpha = 0.92$), relatedness satisfaction ($\alpha = 0.85$) and relatedness frustration ($\alpha = 0.91$), considered excellent[28].

Procedures

To ensure ethical aspects, this research followed the criteria of the Ethics in Research with Human Beings, in accordance with Resolution No. 466/12 of the Brazil National Health Council, under approval of the Federal University of Vale do São Francisco's research ethics committee, with opinion No. 3.576.805. Data collection was carried out from July to October 2023, at the competition venues for each of the modalities (futsal, basketball, handball, volleyball, and table tennis) in the moments leading up to the games. After authorization from the coaches, the athletes were brought together and, upon agreeing to participate in the research, they received the same instructions for answering the questionnaires. Although data collection occurred in group settings, athletes completed the questionnaires individually, with sufficient space between respondents. Confidentiality and anonymity were emphasized, and coaches were instructed to avoid remaining close during questionnaire completion to reduce peer or authority pressure. Any questions that arose were answered by the researchers present, reinforcing data confidentiality. The participants had approximately 30 minutes to complete the questionnaires.

Data analysis

The data were analyzed using SPSS software version 25.0 for conduction of descriptive and inferential statistical tests. Initially, data normality was verified using the Kolmogorov-Smirnov test. Bootstrapping procedures (1000 resamplings; 95% CI BCa) were performed to obtain greater reliability of results, to correct deviations from normality of the sample distribution and differences among group sizes, and also to present a 95% confidence interval for the differences among the means[31]. Mean and standard deviation were adopted as measures of central tendency and dispersion. Pearson's correlation was used to investigate the relationship between university sport experiences and satisfaction and frustration of basic psychological needs. Six multiple linear regression models were conducted using the enter method to input variables in order to verify the association of university sport experiences with satisfaction and frustration of basic psychological needs. Six regression models were conducted

because each basic psychological need (autonomy, competence, and relatedness) comprises two distinct dimensions—satisfaction and frustration—which represent theoretically independent motivational states in SDT. Therefore, separate models allowed clearer interpretation of the unique contribution of sport experiences to each outcome. Variance Inflation Factors (VIF) were calculated to analyze multicollinearity indicators (VIF < 5.0). It was adopted–a significance level of $p < 0.05$. A post hoc power analysis conducted in GPower 3.1 indicated that the final sample size of 135 participants provided a statistical power of 89.95% for detecting small-to-moderate effect sizes ($f^2 = 0.15$) in the regression models with eight predictors, assuming $\alpha = .05$.

Results

A total of 141 college athletes participated in the research, but six athletes failed to answer one questionnaire or more. Thus, the participants were 135 athletes of both sexes, 120 male and 15 female, participating in the University Games in the following modalities: futsal (n = 39); handball (n = 15); volleyball (n = 4); basketball (n = 41) and table tennis (n = 16). The athletes had an average age of 23.43 years (SD = 9.77) and were playing the sport for 69.71 months (SD = 65.67), with a training frequency of 2.43 times a week (SD = 1.29).

Table 1 presents a descriptive analysis for the dimensions concerning sport experiences and the satisfaction and frustration of the college athletes' basic psychological needs. The mean scores on the USES-BR 1-7 response scale, from highest to lowest, were: initiative (M = 5.91; SD = 0.99), interpersonal relationships (M = 5.87; SD = 0.99), social skills (M = 5.85; SD = 0.95), basic skills (M = 5.15; SD = 1.44), adult network (M = 4.81; SD = 1.48), stress (M = 3.44; SD = 1.60), social exclusion (M = 2.92; SD = 1.59) and inappropriate behavior (M = 2.60; SD = 1.53). The mean scores on the PNSSS 1-7 response scale, from highest to lowest, were: competence satisfaction (M = 5.73; SD = 1.08), relatedness satisfaction (M = 5.71; SD = 0.97), autonomy satisfaction (M = 5.30; SD = 1.43), autonomy frustration (M = 3.95; SD = 1.80), relatedness frustration (M = 2.20; SD = 1.39), and competence frustration (M = 2.09; SD = 1.53).

Regarding the correlations, it is possible to observe the following significant ($p<0.05$) and positive correlations between the dimensions of sport experiences and satisfaction of basic psychological needs: with autonomy satisfaction, the dimensions of initiative (r=0.18), basic skills (r=0.33), interpersonal relationships (r=0.22) and social skills (r=0.20); competence satisfaction with social skills (r=0.37), adult network (0.27), stress (r=0.18) and inappropriate behavior (r=0.21); and with relatedness satisfaction, the dimensions of initiative (r=0.18), social skills (r=0.32), adult network (r=0.23) and inappropriate behavior (r=0.18). In their turn, the dimensions of university sport experiences that showed correlation with frustration of basic psychological needs were: the dimensions of initiative (r=0.29), basic skills (r=0.34), interpersonal relationships (r=0.24) and inappropriate behavior (r=0.24) with autonomy frustration; with competence frustration, the dimensions of stress (r=0.26), social exclusion (r=0.33) and inappropriate behavior (r=0.42); finally, the dimensions of social exclusion (r=0.25) and inappropriate behavior (r=0.36) correlated with relatedness frustration.

Table 1. Descriptive analysis and correlation concerning the dimensions of sport experiences with satisfaction and frustration of college athletes' basic psychological needs

Variables	Sport experiences								Basic psychological needs					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Initiative	-	0.58**	0.63**	0.55**	0.18*	-0.04	-0.06	0.04	**0.18****	**0.29****	0.05	0.02	**0.18***	0.06
2. Basic skills		-	0.64**	0,33**	0.18*	-0,01	0.03	0.17	**0,33****	**0.34****	0.04	-0,01	0,14	0.09
3 Interpersonal relationships			-	0.63**	0.34**	0.18*	0.04	0.12	**0.22***	**0.24****	0.08	-0.05	0.13	-0.02
4. Social skills				-	0.57**	0,27**	0.12	0.17	**0.20***	0.04	**0.37****	0.04	**0.32****	0.03
5. Adult network					-	0.41**	0.23**	0.16	0.13	-0.09	**0,27****	-0,01	**0.23****	-0.08
6. Stress						-	0.64**	0.54**	-0.04	-0.09	**0.18***	**0.26****	0.17	0.11
7. Social Exclusion							-	0.76**	0.02	0.04	0.13	**0,33****	0,14	**0.25****
8. Inappropriate Behavior								-	0.06	**0.24****	**0.21***	**0.42****	**0.18***	**0.36****
9. Autonomy satisfaction									-	0.47**	-0.03	0.19*	0.01	0.15
10. Autonomy frustration										-	-0.19*	0.36**	-0.20*	0.37**
11. Competency satisfaction											-	-0.17	0.57**	-0.11
12. Competence frustration												-	0.05	0.70**
13. Relatedness satisfaction													-	-0.12
14. Relatedness frustration														-
Mean	5.91	5.15	5.87	5.85	4.80	3.44	2.92	2.60	5.30	3.95	5.73	2.08	5.71	2.20
Standard deviation	0.99	1.44	0.99	0.95	1.48	1.60	1.59	1.53	1.43	1.80	1.08	1.53	0.97	1.39

Note: * p>0.05; **p>0.01
Source: The authors

Multiple regression analyses (Table 2) revealed that the six models that included college athletic experiences explained a significant amount of satisfaction or frustration of basic psychological needs (r^2 between 0.09 and 0.19, $p < 0.05$). Specifically, the domain of basic skills presented a positive prediction on autonomy satisfaction ($\beta = 0.34$, $p < 0.01$), the domain of social skills presented a positive prediction on competence satisfaction ($\beta = 0.52$, $p < 0.001$) and relatedness satisfaction ($\beta = 0.33$, $p < 0.05$). Inappropriate behavior showed a positive prediction for autonomy frustration ($\beta = 0.38$, $p < 0.01$), competence frustration ($\beta = 0.37$, $p < 0.01$) and relatedness frustration ($\beta = 0.37$, $p < 0.01$). These findings reveal that scores indicating inappropriate behavior on the part of sports leaders act as predictors for frustration of basic psychological needs.

Table 2. College sport experiences as predictors of satisfaction and frustration of Braziliancollege athletes' basic psychological needs.

Predictors	Autonomy satisfaction	Autonomy frustration	Competence satisfaction	Competence frustration	Relatedness satisfaction	Relatedness frustration
	β (95%CI)	β (95%CI)	β (95%CI)	β (95%CI)	β (95%CI)	β (95%CI)
Initiative	-0.11 (-0.51;0.19)	0.22 (-0.01; 0.83)	-0.15 (-0.41; 0.10)	0.12 (-0.18; 0.54)	0.07 (-0.17; 0.31)	0.08 (-0.23; 0.45)
Basic skills	**0.34** (0.10; 0.58)**	0.14 (-0.11; 0.48)	0.06 (-0.12; 0.22)	-0.00 (-0.24; 0.24)	0.12 (-0.08; 0.24)	0.10 (-0.13; 0.32)
Interpersonal relationships	-0.02 (-0.41; 0.36)	0.11 (-0.26; 0.66)	-0.24 (-0.54; 0.20)	-0.19 (-0.69; 0.11)	-0.24 (-0.50; 0.02)	-0.20 (-0.64; 0.10)
Social skills	0.15 (-0.17; 0.62)	-0.16 (-0.77; 0.16)	**0.52*** (0.30; 0.87)**	0.06 (-0.31; 0.50)	**0.33* (0.07; 0.60)**	0.11 (-0.21; 0.54)
Adult network	0.06 (-0.15; 0.27)	-0.08 (-0.35; 0.15)	0.05 (-0.11; 0.19)	-0.11 (-0.33; 0.10)	0.06 (-0.10; 0.18)	-0.16 (-0.35; 0.05)
Stress	-0.15 (-0.35; 0.08)	-0.15 (-0.42; 0.08)	0.02 (-0.14; 0.17)	0.13 (-0.10; 0.34)	0.07 (-0.10; 0.18)	-0.03 (-0.23; 0.17)
Social Exclusion	0.03 (-0.22; 0.28)	-0.09 (-0.39; 0.19)	-0.13 (-0.27; 0.09)	0.04 (-0.25; 0.26)	-0.03 (-0.19;0.15)	0.02 (-0.22; 0.25)
Inappropriate Behavior	0.04 (-0.20; 0.27)	**0.38** (0.17; 0.73)**	0.22 (-0.01; 0.33)	**0.37** (0.13; 0.61)**	0.11 (-0.09; 0.23)	**0.37** (0.11; 0.56)**
R^2	0.09	0.19	0.16	0.15	0.09	0.12
F	**2.538***	**4.873*****	**4.256*****	**3.998*****	**2.611***	**3.200****
DW	1.579	1.363	1.604	1.500	1.705	1.742

Note: * p>0.05; **p>0.01 ***p>0.001. Only standardized regression coefficients that were less than the 0.05 significance level are highlighted in bold. β = Standardized regression coefficient; CI = 95% confidence interval
Source: Authors

Discussion

The present research investigated the predictive role of sport experiences in the satisfaction and frustration of basic psychological needs of college athletes. The results reported in this investigation may provide new information for future studies involving sport experiences and satisfaction and frustration of basic psychological needs within the Brazilian university sports context. The main findings show that basic skills presented a positive prediction for autonomy satisfaction, while social skills had a positive predictive role for competence and relatedness satisfaction. On the other hand, inappropriate behavior presented a positive prediction for autonomy, competence and relatedness frustration.

In terms of our objectives, the linear regression model showed that basic skills are associated to autonomy satisfaction in university athletes ($\beta = .34$; $R^2 = .09$). These findings

allow for understanding that the ability to be proactive, to set goals, to make an effort, to plan, and to have discipline, as well as the individual's academic, athletic, and personal contexts, are more evident in college athletes who have their basic psychological need for autonomy satisfied. Autonomy is considered the most central aspect of the SDT because it influences several positive factors within the sports context[20,22]. With positive sport experiences through basic skills, autonomy satisfaction transforms daily training into meaningful tasks so that the athlete feels autonomous and, therefore, optimizes their performance. In this way, as basic skills progress, autonomy satisfaction tends to be boosted. Thus, the findings of the present investigation corroborate those reported in the literature, showing that basic skills are positively related, rather than deterministic "precursors," to autonomy satisfaction[20,22].

Social skills had a positive predictive role for competence and relatedness satisfaction. These findings show that feelings of connection and the intention to cultivate emotional bonds with the people inserted in the context are important factors for competence in sports activities, bonding and social interaction[20,22]. Thus, we understand that sport experiences through social skills acquired within sports represent a context in which the athlete feels capable of performing their tasks and responsibilities inside and outside the sporting context, in addition to creating bonds both inside and outside sports. From this perspective, the findings are in line with the literature, showing that social skills are positive associated to competence and relatedness satisfaction within the university sports context[20,22]. Furthermore, Eather et al.[32] observed, in a systemic review, that sports participation is related to interpersonal communication and pro-social behavior, i.e., social interaction and bonding. In addition, the regression coefficients found in this study (β values ranging from .32 to .53) reinforce the robustness of these associations.

Finally, our findings showed that negative sport experience as inappropriate behavior had a positive predictive role for frustration of the three basic psychological needs (competence, autonomy and relatedness). These findings show that, when college athletes perceive that behaviors, interactions or expectations are inappropriate, they feel frustrated in the three basic psychological needs and harm their development both inside and outside the sports context[33]. These findings corroborate those reported by Mahoney et al.[34], who argued that, for Australian runners, negative sport experiences were positively associated with frustration of the three basic psychological needs. In a cross-sectional study with judo fighters, that lack of engagement was associated with frustration of the three basic psychological needs[35]. Thus, as inappropriate behavior progresses, frustration as to relatedness, competence and autonomy tends to grow. Thus, the findings of the present investigation corroborate those reported in the literature, showing that inappropriate behavior is related to the frustration of basic psychological needs[33-35]. However, consistent with the cross-sectional design, these findings represent statistical associations rather than causal effects. Regression coefficients (β = .37 to .38) and R^2 values (ranging from .12 to .19) demonstrate moderate explanatory power, but do not imply directionality or temporal precedence.

A relevant aspect to consider is the specific sociocultural context of Brazilian university sport. Unlike countries where collegiate sport is highly structured and integrated into the educational system, Brazilian university competitions often lack stable funding, organizational support, and consistent training conditions[36]. Athletes frequently balance academic demands, employment, and irregular training schedules. These contextual constraints may intensify both positive and negative sport experiences, shaping how basic psychological needs are satisfied or frustrated. Furthermore, Brazilian university teams often rely on volunteer coaches and limited institutional infrastructure, which may amplify the impact of interpersonal dynamics and organizational stressors on athletes' motivational experiences[36]. Therefore, the associations observed in this study should be interpreted within the unique structural and cultural characteristics of Brazilian university sport.

The present findings also contribute to the theoretical refinement of SDT by suggesting that different types of sport experiences may relate differently to the satisfaction and frustration of basic psychological needs[22,37]. For instance, positive interpersonal experiences (e.g., social skills) were more strongly linked to relatedness and competence satisfaction, whereas negative experiences (e.g., inappropriate behavior) showed consistent associations with the frustration of all three needs[21,22]. This asymmetry aligns with recent SDT work indicating that need satisfaction and need frustration are not opposites on a continuum but operate as distinct motivational processes[37]. Therefore, our findings reinforce the conceptual distinction between these dimensions and highlight the importance of examining both simultaneously in university sports contexts.

From an applied perspective, these findings point to practical recommendations for coaches, sport coordinators, and university administrators. Autonomy-supportive strategies, such as giving athletes choices, encouraging initiative, and providing constructive rationales, may strengthen the benefits of basic skill development. Promoting prosocial interactions and teamwork activities may further enhance competence and relatedness satisfaction. Conversely, institutions should actively monitor and address inappropriate behaviors, negative leader–athlete interactions, and organizational stressors that could contribute to need frustration. Universities may also benefit from implementing formal coach education programs, mentorship structures, and athlete-support services to create motivationally healthy environments. These initiatives could mitigate the negative impact of structural limitations commonly found in Brazilian university sport.

Despite the important findings presented in this study, regarding sport experiences and the factors involving satisfaction and frustration of basic psychological needs in college athletes, some limitations need to be pointed out. Firstly, it is important to acknowledge that the study's cross-sectional design and reliance on self-report measures limit causal inference, and future research should corroborate these associations using longitudinal or experimental designs. Future studies may also investigate specific interventions, such as autonomy-supportive coach training, programs aimed at developing athletes' interpersonal and basic sport skills, and institutional policies that reduce controlling or unsupportive behaviors in sport environments. Secondly, because the sample was recruited through non-probabilistic convenience sampling, the findings cannot be generalized to all Brazilian university athletes. Therefore, the results should be interpreted within the specific context of the Pernambuco University Games. In addition, it is worth highlighting that other experiences the participants have in other spheres of life were not investigated, and it is known that all day-to-day experiences affect the satisfaction and frustration of basic psychological needs. Finally, data collection was carried out in a single location, reaching only the niche of a specific region; therefore, a possible limitation is the absence of data from other regions of Brazil. Thus, future investigations should carry out longitudinal studies that allow for different measurements of sport experiences in different contexts, with a greater scope, so that results that are more generalized to the country's reality can be obtained.

Conclusion

Based on the findings, it can be concluded that there were associations between different dimensions of sport experiences and basic psychological needs among university athletes. Basic and social skills were positively related to the satisfaction of autonomy, competence, and relatedness needs, whereas inappropriate behaviors by sport leaders were associated with greater frustration of these needs. Regression analyses indicated that basic skills and social skills contributed to variance in need satisfaction, while inappropriate leader behavior

contributed to variance in the frustration of autonomy, competence, and relatedness, reinforcing the relevance of interpersonal dynamics in athletes' motivational experiences.

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