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Original Article

Sleep quality and quality of life among health sciences university students

Qualidade do sono e qualidade de vida em estudantes universitários da área da saúde

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ABSTRACT

Objective: to analyze the prevalence of poor sleep quality and its correlation with quality of life among health sciences university students. **Methods:** this cross-sectional analytical study was conducted with 369 students enrolled in health sciences programs at a public university. Sleep quality was assessed using the Pittsburgh Sleep Quality Index, and quality of life was evaluated using the World Health Organization Quality of Life-BREF. Data were analyzed using descriptive statistics, inferential tests, and correlation analyses, with a significance level of 5%. **Results:** the prevalence of poor sleep quality was 75.3%. The median overall quality-of-life perception score was 75.0. A significant association was observed between poor sleep quality and the presence of insomnia and anxiety, as well as lower scores in the physical and psychological domains. Poor sleep quality was negatively correlated with all quality-of-life domains, with the strongest correlations observed in the physical and psychological domains. **Conclusion:** poor sleep quality was highly prevalent and was associated with emotional factors and reduced quality of life. **Contributions to practice:** these findings highlight the need for institutional strategies aimed at prevention, mental health promotion, and sleep monitoring. **Descriptors:** Quality of Life; Sleep Initiation and Maintenance Disorders; Students, Health Occupations; Prevalence.

RESUMO

Objetivo: analisar a prevalência da má qualidade do sono e sua correlação com a qualidade de vida em estudantes universitários da área da saúde. **Métodos:** estudo transversal e analítico, realizado com 369 estudantes de cursos da área da saúde de uma universidade pública. A qualidade do sono foi avaliada pelo *Quality Index Questionnaire Pittsburgh Sleep*. Já a qualidade de vida pelo *World Health Organization Quality of Life-BREF*. Os dados foram analisados por estatística descritiva, testes de inferências e correlação, com nível de significância de 5%. **Resultados:** a prevalência de **má qualidade do sono foi** de 75,3%. A percepção geral da qualidade de vida apresentou mediana de 75,0. Verificou-se associação significativa entre a má qualidade do sono e a presença de insônia e ansiedade e menores escores nos domínios físico e psicológico. Correlação negativa entre o má qualidade do sono e todos os domínios da qualidade de vida, com maior magnitude nos domínios físico e psicológico. **Conclusão:** a má qualidade do sono mostrou-se altamente prevalente e associada a fatores emocionais e à redução da qualidade de vida. **Contribuições para a prática:** os achados evidenciam a necessidade de estratégias institucionais de prevenção, promoção da saúde mental e monitoramento do sono.
Descritores: Qualidade de Vida; Distúrbios do Início e da Manutenção do Sono; Estudantes de Ciências da Saúde; Prevalência.

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Introduction

Sleep is a vital function characterized by the temporary suspension of consciousness and alertness, accompanied by reduced metabolism, muscle relaxation, and decreased responsiveness to sensory stimuli[1]. During this period, essential processes of physical and mental recovery take place, allowing the body to reorganize after wakefulness. Adequate sleep is associated with improved cognitive functions, such as reasoning and language, while also enhancing creativity, reducing stress, and promoting better quality of life[1-2].

Among the most common sleep disturbances, ineffective sleep pattern stands out. According to NANDA International, the nursing diagnosis of ineffective sleep pattern is defined as difficulty experiencing the natural and periodic suspension of relative consciousness, resulting in impaired functioning[3]. University students are exposed to excessive use of electronic devices, anxiety, fatigue, alcohol consumption, caffeine intake, consumption of sugar-sweetened beverages, and reduced engagement in healthy lifestyle behaviors. These stressors make them more vulnerable to sleep-related problems[3-4].

Quality of life, in turn, is understood as an individual's perception of their own position in life within the context of the culture and value systems in which they live, as well as in relation to their goals, expectations, personal standards, and concerns[1]. Among university students, quality of life may be negatively affected by sleep disorders, particularly insomnia[4].

A previous study has reported a high prevalence of sleep disturbances in this population. One study found that 71% of students had poor sleep quality, and nearly half (49.1%) reported a sleep latency of 31 to 60 minutes, indicating substantial difficulty initiating sleep. Regarding quality of life, higher scores reflecting poorer sleep quality were negatively correlated with all quality-of-life domains, reinforcing that sleep impairment directly affects students' physical, psychological, social, and environmental well-being[5].

Sleep disturbances may compromise the physical, occupational, cognitive, and social performance of university students, negatively affecting both quality of life and academic achievement[6]. Furthermore, university students are more susceptible to mental health and sleep-related problems, with up to a threefold higher risk of psychological disorders compared with the general population, which may lead to poor academic performance and increased dropout rates. Factors such as chronic stress, lack of time, and difficulty maintaining a balanced routine further aggravate this situation, impairing both quality of life and sleep quality[7].

Mental health problems, alterations in sleep patterns, and reduced quality of life among undergraduate students therefore constitute a global public health concern[7]. In this context, the development of health-related interventions aimed at improving sleep patterns and quality of life in this population is of particular importance[8].

There is a scarcity of studies investigating poor sleep quality and quality of life, particularly among health sciences students attending public universities[1,7]. This gap is especially relevant in the context of the present study, which was conducted in a region historically marked by social inequalities, lower average income, and limited access to health and educational services compared with other regions of the state and the country. There is also a need to better understand how poor sleep quality and quality of life manifest among university students through the use of validated instruments capable of providing accurate assessments of these outcomes.

The analysis of these indicators may contribute to a better understanding of the impact of sleep disturbances on quality of life, providing evidence to support the development of institutional strategies focused on student support, monitoring, health promotion, and preventive interventions. Ultimately, these efforts may foster a healthier academic experience and reduce the negative consequences associated with poor sleep quality and diminished quality of life among health sciences students.

Therefore, the aim of this study was to analyze the prevalence of poor sleep quality and its correlation with quality of life among health sciences university students.

Methods

Study design, setting, and period

This cross-sectional analytical study was performed in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines. The research was conducted at a public higher education institution located in northern Minas Gerais, Brazil. Data were collected in person between March and May 2025.

Population and sample: inclusion and exclusion criteria

The study population consisted of students enrolled in the Nursing, Medicine, Dentistry, Psychology, and Physical Education programs. Sample size was calculated based on a finite population of 1,719 students actively enrolled in February 2025. Assuming a conservative estimated prevalence of 50%, a 95% confidence level, and a 5% margin of error, the minimum required sample size was calculated as 315 participants. Participants were selected through convenience sampling based on accessibility, as well as students' interest and willingness to voluntarily participate in the study.

Eligible participants were students aged 18 years or older who were officially enrolled and actively attending their academic programs. Students who were absent during data collection or who declined to sign the informed consent form were excluded. A total of 369 university students participated in the study.

Study protocol

Participants were recruited through announcements on social media, institutional bulletin boards, and direct communication in classrooms. Students who met the eligibility criteria and expressed interest in participating provided written informed consent before enrollment.

Data collection was conducted in person during classroom sessions using a printed self-administered questionnaire. Students completed the questionnaire in the classroom alongside their peers and could either fill it out immediately or take it home for private completion and return it later. The average completion time was approximately 15 minutes. Data collection was scheduled at times that did not interfere with academic activities, such as before classes, during breaks, or after lectures.

Variables

The variables of interest included participants' sociodemographic and clinical characteristics, namely age, sex, marital status, academic program, academic year, income, skin color, municipality of origin, presence of comorbidities, use of psychotropic medications (including treatment duration and potential adverse effects), and engagement in non-pharmacological therapies.

Sleep quality was assessed using the Pittsburgh Sleep Quality Index–Brazilian version (PSQI-BR)[9]. Quality of life was evaluated using the World Health Organization Quality of Life-BREf (WHOQOL-BREF)[10].

Data sources and measurement

Sociodemographic and clinical data were collected through a self-administered questionnaire specifically developed for this study. The questionnaire included information on sex, age, self-reported race/skin color, marital status, academic program, academic year, employment status, family income (in minimum wages), self-reported comorbidities, and self-reported medication use.

Sleep quality was assessed using the PSQI-BR, a standardized instrument designed to evaluate sleep quality over the previous month. PSQI-BR consists of 19 self-reported items organized into seven components, each scored 0-3: 1) subjective sleep quality; 2) sleep latency; 3) sleep duration; 4) habitual sleep efficiency; 5) sleep disturbances; 6) use of sleep medication; and 7) daytime dysfunction related to sleep. The sum of the component scores yields a global sco-

re, classifying sleep quality as good (0-4 points), poor (5-10 points), or indicative of a sleep disorder (>10 points). For the purposes of this study, poor sleep quality was defined as a PSQI-BR score ≥5, whereas scores <5 indicated good sleep quality[9].

Quality of life was assessed using the WHOQOL-BREF[10], which comprises 26 items distributed across four domains: physical, psychological, social, and environmental. WHOQOL-BREF also includes two general questions evaluating overall quality of life and satisfaction with health. Responses are recorded on a five-point Likert scale, with higher scores indicating better perceived quality of life. Domain scores were transformed to a 0-100 scale. Because no established cutoff points exist for the WHOQOL-BREF, higher scores were interpreted as reflecting better quality of life.

Statistical analysis

Data were analyzed using the software SPSS®, version 24. Initially, descriptive analyses of sociodemographic variables, clinical characteristics, and quality-of-life scores were performed, with results presented as absolute and relative frequencies.

To assess associations between sociodemographic variables, quality-of-life domains, and sleep quality, measured using the dichotomized PSQI-BR (good vs poor sleep quality), bivariate analyses were conducted using Pearson's Chi-square test. For analytical purposes, WHOQOL-BREF domain scores were dichotomized according to the median (<median and ≥median), given the absence of predefined cutoff points and the non-normal distribution of the data, as verified by the Shapiro-Wilk test ($p \leq 0.05$) in most domains.

Based on the results of the bivariate analyses, all categorical variables associated with the PSQI-BR at $p<0.20$ were initially included in a Poisson regression model with robust variance to estimate adjusted prevalence ratio (PR) and their respective 95% confidence interval (CI).

Variables were subsequently removed sequentially according to their statistical significance until the final model retained only those with $p<0.05$ or those considered potential confounders of the outcome.

Model fit was assessed using Pearson's Chi-square test, whereas predictive adequacy was evaluated through analysis of fitted values and standardized residuals. No systematic patterns or influential outliers were identified. A significance level of 5% ($p<0.05$) was adopted for all analyses.

In addition, correlations between the total PSQI-BR score and WHOQOL-BREF domain scores were assessed using Spearman's correlation coefficient, given the nonparametric distribution observed for most WHOQOL-BREF domains.

Ethical considerations

In accordance with the ethical principles established by the Brazilian National Health Council, this study was approved by the Research Ethics Committee at *Universidade Estadual de Montes Claros* (Opinion No. 6.320.239/2023; Certificate of Presentation for Ethical Consideration No. 73849723.6.0000.5146).

Results

A total of 369 health sciences students participated in the study, the majority of whom were female (n=268; 72.6%) and aged 22 years or younger (mean age: 22.45±4.10 years). Regarding sleep quality, 278 participants (75.3%) were classified as having poor sleep quality according to the PSQI-BR (score >5). The median overall quality-of-life perception score was 75.0 (75.0–75.0).

In the bivariate analysis assessing the association between sleep quality and the independent variables (Table 1; Table 2), statistically significant associations at a significance level of up to 20% ($p<0.20$) were identified for sex, the presence of symptoms of depression, anxiety, and insomnia, use of medications for insomnia or anxiety, and all quality-of-life domains assessed by the WHOQOL-BREF. These variables were selected for inclusion in the Poisson regression model with robust variance.

Table 1 – Distribution of sociodemographic variables and bivariate analysis according to sleep quality (PSQI--BR) among health sciences students (n=369). Montes Claros, MG, Brazil, 2025

Variables	n (%)	Sleep quality (PSQI-BR)		p-value*
		Good (n=91)	Poor (n=278)	
		n (%)	n (%)	
Sex				
Male	101 (27.4)	33 (32.7)	68 (67.3)	0.028
Female	268 (72.6)	58 (21.6)	210 (78.4)	
Age group (years)				
≤22	230 (62.3)	60 (26.1)	170 (73.9)	0.414
>22	139 (37.7)	31 (22.3)	108 (77.7)	
Race/skin color (self-reported)				
White	129 (35.0)	34 (26.4)	95 (73.6)	0.580
Black, brown, or other	240 (65.0)	57 (23.8)	183 (76.3)	
Marital status				
With a partner	22 (6.0)	6 (27.3)	16 (72.7)	0.769
Without a partner	347 (94.0)	85 (24.5)	262 (75.5)	
Academic program				
Nursing	185 (50.1)	41 (22.2)	144 (77.8)	0.269
Medicine	76 (20.6)	25 (32.9)	51 (67.1)	
Physical Education (Bachelor's or Licensure Degree)	58 (15.7)	12 (20.7)	46 (79.3)	
Other	50 (13.6)	13 (26.0)	37 (74.0)	
Academic semester				
1st-5th	232 (62.9)	55 (23.7)	177 (76.3)	0.580
6th-10th	137 (37.1)	36 (26.3)	101 (73.7)	
Engaged in paid employment				
No	242 (65.6)	63 (26.0)	179 (74.0)	0.399
Yes	127 (34.4)	28 (22.0)	99 (78.0)	
Family income (Brazilian minimum wages)				
≤1	86 (23.3)	18 (20.9)	68 (79.1)	0.285
2-3	169 (45.8)	39 (23.1)	130 (76.9)	
≥4	114 (30.9)	34 (29.8)	80 (70.2)	

*Pearson's Chi-square test; PSQI-BR: Pittsburgh Sleep Quality Index – Brazilian version

Table 2 – Distribution of clinical and quality-of-life variables and bivariate analysis according to sleep quality (PSQI-BR) among health sciences students (n=369). Montes Claros, MG, Brazil, 2025

Variables	n (%)	Sleep quality (PSQI-BR)		p-value*
		Good (n=91)	Poor (n=278)	
		n (%)	n (%)	
Depression				
No	332 (90.0)	87 (26.2)	245 (73.8)	0.039
Yes	37 (10.0)	4 (10.8)	33 (89.2)	
Anxiety				
No	245 (66.4)	79 (32.2)	166 (67.8)	<0.001
Yes	124 (33.6)	12 (9.7)	112 (90.3)	
Insomnia				
No	331 (89.7)	91 (27.5)	240 (72.5)	<0.001
Yes	38 (10.3)	0 (0.0)	38 (100)	
Medication use for insomnia or anxiety				
No	295 (79.9)	86 (29.2)	209 (70.8)	<0.001
Yes	74 (20.1)	5 (6.8)	69 (93.2)	
WHOQOL-BREF domains				
Overall quality-of-life perception				
<75	81 (22.0)	9 (11.1)	72 (88.9)	0.001
≥75	288 (78.0)	82 (28.5)	206 (71.5)	
Satisfaction with health				<0.001
<75	179 (48.5)	29 (16.2)	150 (83.8)	
≥75	190 (51.5)	62 (32.6)	128 (67.4)	
Physical domain				
<68	220 (59.6)	22 (10.0)	198 (90.0)	<0.001
≥68	149 (40.4)	69 (46.3)	80 (53.7)	
Psychological domain				
<62	168 (45.5)	15 (8.9)	153 (91.1)	<0.001
≥62	201 (54.5)	76 (37.8)	125 (62.2)	
Social domain				
<67	190 (51.5)	32 (16.8)	158 (83.2)	<0.001
≥67	179 (48.5)	59 (33.0)	120 (67.0)	
Environmental domain				
<62	169 (45.8)	24 (14.2)	145 (85.8)	<0.001
≥62	200 (54.2)	67 (33.5)	133 (66.5)	

*Pearson's Chi-square test; WHOQOL-BREF: World Health Organization Quality of Life-BREF; PSQI-BR: Brazilian Version of the Pittsburgh Sleep Quality Index

In the multivariable Poisson regression analysis with robust variance, poor sleep quality was significantly associated with the presence of insomnia (PR=1.12; 95%CI: 1.03–1.21; p=0.009), anxiety (PR=1.12; 95%CI: 1.01–1.25; p=0.029), lower scores (<68) in the physical domain (PR=1.49; 95%CI: 1.26–1.75; p<0.001), and lower scores (<62) in the psychological domain (PR=1.19; 95%CI: 1.06–1.34; p=0.004) of the WHOQOL-BREF (Table 3).

The global PSQI-BR score showed significant negative correlations with all WHOQOL-BREF domains, indicating that higher levels of poor sleep quality were associated with lower perceived quality of life. A moderate correlation (ρ > |0.40|) was observed for the psychological domain (ρ=−0.562; p<0.01), and a strong correlation (ρ > |0.60|) was found for the physical domain (ρ=−0.614; p<0.01), demonstrating that poorer sleep quality was strongly associated with lower scores in these aspects of quality of life (Table 4).

Table 3 – Prevalence ratio and 95% confidence interval for factors associated with sleep quality among health sciences students according to Poisson regression with robust variance (n=369). Montes Claros, MG, Brazil, 2025

Variables	PR	95%CI	p-value*
Insomnia			
No	1.00		
Yes	1.12	1.03–1.21	0.009
Anxiety			
No	1.00		
Yes	1.12	1.01–1.25	0.029
Physical domain			
≥68	1.00		
<68	1.49	1.26–1.75	<0.001
Psychological domain			
≥62	1.00		
<62	1.19	1.06–1.34	0.004

*Pearson's Chi-square test; CI: Confidence interval; PR: Prevalence ratio

Table 4 – Spearman correlations between the global PSQI-BR score and WHOQOL-BREF domain scores among health sciences students (n=369). Montes Claros, MG, Brazil, 2025

Variables	1	2	3	4	5	6	7
1. PSQI-BR	1						
2. Overall quality-of-life perception	−0.306*	1					
3. Satisfaction with health	−0.375*	0.478*	1				
4. Physical domain	−0.614*	0.449*	0.522*	1			
5. Psychological domain	−0.562*	0.499*	0.538*	0.642*	1		
6. Social domain	−0.375*	0.280*	0.282*	0.438*	0.521*	1	
7. Environmental domain	−0.362*	0.494*	0.319*	0.520*	0.501*	0.483 *	1

*Correlation significant at the p<0.01 level (two-tailed); PSQI-BR: Brazilian Version of the Pittsburgh Sleep Quality Index

Discussion

The present study found a high prevalence of poor sleep quality, affecting 75.3% of participants. These findings are consistent with previous studies in which, among 1.234 university students, 65.5% presented PSQI-BR scores higher than 5 and were therefore classified as having poor sleep quality[11]. Similarly, different sleep profiles were identified among 1.526 university students, of whom 8.2% were classified as belonging to the "insomnia risk" profile, characterized by high levels of stress, difficulty initiating sleep, and pronounced daytime dysfunction[12].

Regarding insomnia, participants who reported this condition had a 12% higher prevalence of poor sleep quality compared with those without insomnia. Similar findings have been reported, with 70.5% of university students presenting poor sleep quality and insomnia being identified as the main indicator associated with inadequate sleep in 98.7% of participants[12]. Poor sleep quality and insomnia are associated with adverse health outcomes and impaired

overall performance, as insufficient sleep is linked to greater vulnerability to stress, particularly among health sciences students, who frequently face demanding and extensive academic workloads[6].

Furthermore, insomnia is associated with psychological distress and impaired sleep patterns[1,4]. Both conditions are related to insufficient rest, poor sleep hygiene, and bedtime procrastination. Prolonged sleep latency and excessive daytime sleepiness represent persistent challenges that are negatively associated with both sleep quality and quality of life among university students[12-13].

Similarly, the presence of anxiety symptoms was associated with a 12% higher prevalence of poor sleep quality, and 33.6% of participants reported this condition. Anxiety symptoms among university students may be related to multiple factors inherent to the academic environment, including the transition into university life, academic overload, and financial constraints. This stage of life may be associated with increased vulnerability to the development of anxiety symptoms[14]. The prevalence of self-reported anxiety symptoms among medical students was 36.1%, and 67.1% of those with anxiety presented poor sleep quality (PSQI-BR ≥6), demonstrating a significant association between inadequate sleep and anxiety symptoms. The use of sleep medications was reported by 13.7% of participants, with a significant association observed between anxiety symptoms and the use of these medications[15].

Another relevant aspect concerns the specific challenges experienced by health sciences students, including regular exposure to human suffering, illness, and death, which may contribute to greater emotional burden[12]. These students frequently share common characteristics, such as difficulty sleeping, irregular sleep patterns, and low levels of physical activity. In addition, seeking treatment and psychological support remains hindered by concerns about appearing vulnerable and feelings of insecurity. In this context, physical activity has been described as a factor associated with a lower prevalence of poor sleep quality, as it promotes relaxation, better emotional regulation, reduced anxiety levels, and improved sleep quality[16].

Regarding quality of life, direct and indirect associations between poor sleep quality and quality-of-life domains have been observed among university students. Previous research demonstrated that most students reported feelings of boredom within the university environment and high levels of pressure arising from academic demands, while more than one-quarter perceived their academic performance as poor or fair[17].

In the present study, students with lower scores in the physical domain of quality of life (<68 points) had a 49% higher prevalence of poor sleep quality. These findings are consistent with a study involving 3.380 university students, in which poor sleep quality was indirectly associated with physical health-related quality of life, accounting for 36.9% of the total observed effect. Additional evidence indicates that poorer sleep quality is associated with negative mood, low self-esteem, lower satisfaction with physical well-being, and greater daytime sleepiness, whereas higher levels of physical quality of life are related to healthier eating habits and better weight management[18].

Likewise, in the psychological domain, participants with scores below 62 points had a 19% higher prevalence of poor sleep quality. Previous studies have demonstrated a significant association between sleep quality and mental health-related quality of life[19]. Furthermore, evidence suggests that a substantial proportion of university students experience high levels of worry, reinforcing the negative association between poor sleep quality and impaired psychological well-being[17]. Findings indicate that sleep is one of the factors contributing to students' overall perception of quality of life[20]. Therefore, sleep quality constitutes an important indicator of quality of life[21], and educational interventions focused on sleep hygiene may represent promising strategies for improving the psychological and physical domains of quality of life among university students[22].

Nevertheless, the innovative nature of the pre-

sent study should be highlighted, given the scarcity of Brazilian studies investigating the prevalence of poor sleep quality and its associated factors. Further national studies addressing this important and contemporary topic in academic settings, particularly among health sciences students, are warranted.

Study limitations

Several limitations of this study should be acknowledged. The sample consisted predominantly of women, particularly students enrolled in Nursing and Medicine programs, which traditionally have a higher proportion of female students. This may have introduced selection bias and limited the external validity of the findings. Furthermore, potential sex-related differences in symptom presentation were not explored. Another important limitation is the use of self-reported measures for insomnia, anxiety, and depression without the application of validated assessment instruments.

Finally, convenience sampling restricted to specific academic programs within a single institution limits the generalizability of the findings to other university populations. Future studies should therefore include students from different academic programs and regions and seek a more balanced gender distribution. Despite these limitations, the innovative nature of this study should be emphasized, given the scarcity of Brazilian research, particularly within the context of the present study, investigating the prevalence of poor sleep quality and its association with quality of life among health sciences students, highlighting the relevance and timeliness of this topic in academic settings.

Contributions to practice

The findings of this study have important implications for health practice and university settings by demonstrating the high prevalence of poor sleep quality among health sciences students and its association with insomnia, anxiety, and impairments in the physical and psychological domains of quality of life. These results provide scientific evidence to support the development and strengthening of institutional strategies aimed at promoting mental health and improving well-being in higher education. Preventive initiatives, such as sleep hygiene education programs, psychosocial support services, and emotional support interventions, may help reduce risk factors and mitigate the negative effects of poor sleep quality on academic performance and overall health.

Conclusion

The present study demonstrated that most health sciences university students experienced poor sleep quality despite reporting a generally positive perception of quality of life. Significant associations were observed between poor sleep quality and the presence of insomnia, anxiety, and lower scores in the physical and psychological domains of the WHOQOL-BREF. In addition, significant correlations were identified between poor sleep quality and both the physical and psychological domains.

These findings highlight the importance of physical functioning and mental and emotional well-being in coping with academic demands. Impairments in these factors may negatively affect mental health, physical health, quality of life, sleep quality, and academic performance.

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Author contributions

Conception and design of the study, or analysis and interpretation of data; drafting of the manuscript or critical revision of its intellectual content; final approval

of the version to be published; and accountability for all aspects of the work in ensuring the accuracy and integrity of any part of the manuscript: **Andrade C, Martins BG, Silva DVA, Freitas ALX, Gusmão ROM, Torres JPRV, Araújo DD**.

Data availability

All data supporting the findings of this study are fully available within the article.

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