

ASSOCIAÇÃO ENTRE QUALIDADE DO SONO, ESTRESSE PERCEBIDO E ÍNDICE DE MASSA CORPORAL EM ESTUDANTES DE MEDICINA DA PONTIFÍCIA UNIVERSIDAD CATÓLICA DEL ECUADOR DURANTE O SEGUNDO PERÍODO ACADÊMICO DE 2024–2025

Association Between Sleep Quality, Perceived Stress, and Body Mass Index Among Medical Students at Pontificia Universidad Católica del Ecuador During the Second Academic Term of 2024–2025

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Resumo

Contexto: A qualidade do sono é um determinante fundamental da saúde física e mental, influenciando processos metabólicos, cognitivos e neuroendócrinos. Estudantes de medicina são particularmente vulneráveis à má qualidade do sono e a altos níveis de estresse devido às demandas acadêmicas, o que pode impactar seu estado nutricional, refletido pelo índice de massa corporal (IMC). Contudo, as evidências que integram essas variáveis em contextos locais permanecem limitadas. Objetivo: Determinar a associação entre qualidade do sono e estresse percebido com o IMC em estudantes de medicina da Pontificia Universidad Católica del Ecuador durante o segundo período acadêmico de 2024–2025. Métodos: Foi realizado um estudo transversal analítico com 269 estudantes de medicina do segundo, sexto e décimo semestres. A qualidade do sono foi avaliada pelo Índice de Qualidade do Sono de Pittsburgh (PSQI), o estresse percebido pela Escala de Estresse Percebido (PSS-14), e o IMC foi calculado a partir do peso e da altura medidos. As variáveis foram categorizadas e analisadas pelo teste do qui-quadrado de Pearson para determinar associações, com nível de significância de $p < 0,05$. Resultados: Observou-se alta prevalência de má qualidade do sono (91,45%). Além disso, 95,1% dos estudantes relataram algum nível de estresse percebido. Quanto ao estado nutricional, 68,8% apresentaram IMC normal, enquanto 27,9% apresentaram sobrepeso ou obesidade. Foi encontrada associação estatisticamente significativa entre IMC e qualidade do sono ($\chi^2 = 4,60$; $p = 0,032$), com maior prevalência de má qualidade do sono entre estudantes com sobrepeso/obesidade (97,3%). Da mesma forma, foi identificada associação significativa entre IMC e estresse percebido ($\chi^2 = 5,86$; $p = 0,016$), sendo os níveis mais elevados de estresse mais frequentes entre estudantes com excesso de peso. Conclusões: Há associação significativa entre qualidade do sono, estresse percebido e IMC em estudantes de medicina. Esses achados sugerem uma interação multidimensional na qual o sono inadequado e o alto estresse se relacionam com alterações do estado nutricional. Recomenda-se a adoção de estratégias institucionais abrangentes voltadas à higiene do sono, manejo do estresse e promoção de estilo de vida saudável para melhorar o bem-estar dos estudantes.

Palavras-chave: qualidade do sono; estresse percebido; índice de massa corporal; estudantes de medicina; saúde universitária.

Abstract

Background: Sleep quality is a key determinant of physical and mental health, influencing metabolic, cognitive, and neuroendocrine processes. Medical students are particularly vulnerable to poor sleep quality and high stress levels due to academic demands, which may impact their nutritional status, reflected by body mass index (BMI). However, evidence integrating these variables in local contexts remains limited. **Objective:** To determine the association between sleep quality and perceived stress with BMI in medical students at the Pontificia Universidad Católica del Ecuador during the second academic period of 2024–2025. **Methods:** An analytical cross-sectional study was conducted in 269 medical students from the second, sixth, and tenth semesters. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI), perceived stress through the Perceived Stress Scale (PSS-14), and BMI was calculated from measured weight and height. Variables were categorized and analyzed using Pearson's chi-square test to determine associations, with a significance level of $p < 0.05$. **Results:** A high prevalence of poor sleep quality was observed (91.45%). Additionally, 95.1% of students reported some level of perceived stress. Regarding nutritional status, 68.8% had normal BMI, while 27.9% presented overweight or obesity. A statistically significant association was found between BMI and sleep quality ($\chi^2 = 4.60$; $p = 0.032$), with a higher prevalence of poor sleep among students with overweight/obesity (97.3%). Similarly, a significant association was identified between BMI and perceived stress ($\chi^2 = 5.86$; $p = 0.016$), with higher stress levels more frequent in students with excess weight. **Conclusions:** There is a significant association between sleep quality, perceived stress, and BMI in medical students. These findings suggest a multidimensional interaction in which poor sleep and high stress are related to altered nutritional status. Comprehensive institutional strategies addressing sleep hygiene, stress management, and healthy lifestyle promotion are recommended to improve student well-being.

Keywords: sleep quality; perceived stress; body mass index; medical students; university health.

INTRODUÇÃO

Sleep quality is a key determinant of physical and mental health, contributing to neuroendocrine regulation, energy metabolism, immune function, and cognitive performance. Sleep disturbances have been associated with impaired academic performance, mood disorders, increased cardiometabolic risk, and reduced quality of life. University students, particularly medical students, are vulnerable due to high academic demands, sustained cognitive workload, and continuous exposure to stressors. Studies worldwide report a high prevalence of poor sleep quality among medical students, ranging from 30% to over 70%, depending on sociocultural context and study methodology. This variability reflects the multifactorial nature of sleep, which is influenced by biological, psychological, and behavioral factors, including perceived stress, lifestyle habits, electronic device use, physical activity, and nutritional status. Academic stress is a major contributor to impaired sleep quality, interfering with sleep initiation and maintenance. Similarly, body mass index (BMI), as an indicator of nutritional status, has been associated with sleep disturbances, suggesting a bidirectional relationship mediated by hormonal and metabolic mechanisms. The coexistence of these factors may therefore have important implications for students' overall health. Despite growing evidence, local data integrating sleep quality, perceived stress, and nutritional status among university students remain limited, hindering a comprehensive understanding of their potential interaction. Therefore, this study aimed to determine the association between sleep quality, perceived stress, and BMI among medical students, providing evidence to inform future interventions in the university setting.

RESEARCH PROBLEM

Sleep is a fundamental physiological state required for homeostatic regulation, tissue repair, nervous system function, and metabolic health (Hernández et al., 2019). Although sleep requirements vary primarily by age and individual and genetic factors, adults generally require 7–9 hours per night. However, sleep quality and continuity are also essential for restorative sleep (Jurado Luque, 2016; Alves et al., 2021).

Sleep deprivation, defined as insufficient sleep duration or quality to maintain optimal health, performance, and well-being, has increased in recent decades. University students are particularly vulnerable due to high academic demands, with health sciences students showing a high prevalence of sleep disturbances. Among medical students, reported rates range from 60% to 85% (Ordoñez Luna et al., 2022). Short sleep duration may promote hormonal alterations, including decreased leptin and increased ghrelin levels, potentially increasing appetite, BMI, and obesity risk (Palate Supe, 2020). Sleep deprivation has also been associated with glucose intolerance, diabetes, sympathetic nervous system activation, hypertension, and reduced leptin secretion, further contributing to obesity (Jurado Luque, 2016).

Stress is a physiological and psychological response to perceived threats or demands. Persistent stress can disrupt metabolic and cognitive processes through activation of the hypothalamic–pituitary–adrenal axis and increased cortisol secretion (Carpio Arias et al., 2023). Elevated cortisol may promote increased energy intake, weight gain, abdominal adiposity, and reduced physical activity, resulting in positive energy balance (Rodríguez García, 2019). Among students, chronic stress may additionally contribute to irritability, gastrointestinal symptoms, increased susceptibility to infections or allergies, and tobacco or alcohol consumption (Espinosa-Castro et al., 2020).

Taken together, sleep disturbances, perceived stress, and BMI may interact through interconnected neuroendocrine, metabolic, and behavioral pathways. However, evidence integrating these factors among medical students in Ecuador remains limited, highlighting the need to investigate their association within this population.

RESEARCH QUESTION:

What is the association between sleep quality, perceived stress, and body mass index (BMI) among medical students at Pontificia Universidad Católica del Ecuador during the second academic term of 2024–2025?

JUSTIFICATION

Medical students are particularly vulnerable to poor sleep quality and stress, which may adversely affect academic performance and physical and mental health (Mishra et al., 2022a; Silva et al., 2020a). The academic demands of health sciences programs may lead students to sacrifice sleep time to complete assignments and meet curricular requirements, resulting in daytime fatigue, reduced concentration, and increased susceptibility to stress (Moreno Aguiar GN, 2020).

BMI may also be associated with sleep quality and perceived stress. Poor sleep is commonly reported in individuals with obesity, while the coexistence of sleep disturbances, obesity, and unhealthy dietary patterns may increase the risk of chronic diseases (Alafif & Alruwaili, 2023).

To date, no studies at Pontificia Universidad Católica del Ecuador have jointly evaluated the association between sleep quality, perceived stress, and BMI among medical students. Although previous research has addressed sleep disturbances, the interaction of these three variables has not been specifically investigated (Andrade & Yerovi, 2011). Therefore, this study seeks to characterize their association and provide evidence to inform interventions and strategies aimed at improving sleep and overall health among medical students.

OBJECTIVES

General Objective:

To determine the association between sleep quality, perceived stress, and BMI among medical students at Pontificia Universidad Católica del Ecuador during the second academic term of 2024–2025.

Specific Objectives:

- To assess sleep quality using the Pittsburgh Sleep Quality Index (PSQI).
- To assess perceived stress using the Perceived Stress Scale (PSS).
- To calculate BMI based on measured weight and height.
- To determine the association between sleep quality and BMI.
- To determine the association between perceived stress and BMI.

STUDY HYPOTHESES

H1: Poor sleep quality is significantly associated with a BMI above the normal range among medical students at Pontificia Universidad Católica del Ecuador.

H2: Higher levels of perceived stress are significantly associated with a BMI above the normal range among medical students at Pontificia Universidad Católica del Ecuador.

Study Population

The study population comprised medical students at Pontificia Universidad Católica del Ecuador (PUCE) enrolled in the second, sixth, and tenth academic levels during the second academic term of 2024–2025.

These academic levels were selected to represent students at different stages of medical training while minimizing potential bias related to transitional periods. Early university education involves an adaptation process associated with new academic and personal demands (Pérez-Pulido, 2016). According to the PUCE medical curriculum, problem-based learning begins in the fifth semester through the Adult, Child, and Women’s Comprehensive Health courses, while hospital-based clinical training begins in the ninth semester with IDIS VII. These transitions may involve increased academic and clinical stress. Therefore, the subsequent academic levels were selected to allow students to adapt to these educational modalities before assessment.

The study population was identified from students regularly enrolled during the first academic term of 2024 who, at the time of data collection, were attending the target academic levels.

Study Universe

The study universe comprised 471 students: 198 in the first academic level, 127 in the fifth academic level, and 146 in the ninth academic level.

Table 1. Number of students by academic level (first, fifth, and ninth semesters).

Semester	Number of students
First	198
Fifth	127
Ninth	146
Total	471

Sample Size

The calculated sample size was 333 students: 131 from the first semester, 96 from the fifth semester, and 106 from the ninth semester. Sampling was stratified by academic level to minimize selection bias. The calculation assumed a 95% confidence level and a 5% margin of error and was performed using NetQuest.

Given the anticipated high non-response rate, all 471 students in the study universe were invited to participate.

Eligibility Criteria

Inclusion criteria: (1) medical students enrolled in the second, sixth, or tenth semester during the second academic term of 2024–2025; (2) age ≥18 years; and (3) acceptance of informed consent.

Exclusion criteria: (1) use of hypnotic or sleep medications; (2) use of psychotropic medications, including antipsychotics, anxiolytics, antidepressants, or mood stabilizers; and (3) diagnosed metabolic disorders, including hypothyroidism or diabetes mellitus.

Study Variables

The dependent variable was body mass index (BMI), while sleep quality and perceived stress were the independent variables.

Data Collection Instruments and Procedures

Sleep quality was assessed using the **Pittsburgh Sleep Quality Index (PSQI)**, which evaluates seven components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. Component scores are summed to obtain a global score ranging from 0 to 21, with higher scores indicating poorer sleep quality. A score >5 was considered indicative of poor sleep quality (Hernández et al., 2019).

Perceived stress was assessed using the **Perceived Stress Scale (PSS-14)**, a 14-item self-report instrument assessing perceived stress during the previous month. Items are scored from 0 (*never*) to 4 (*very often*), with reverse scoring for items 4, 5, 6, 7, 9, 10, and 13 (Remor, 2006). Total scores range from 0 to 56, with higher scores indicating greater perceived stress. Scores of 0–

14, 15–28, 29–42, and 43–56 correspond to increasing levels of perceived stress, from minimal to very high (Torres-Lagunas et al., 2015).

BMI was calculated as weight (kg)/height² (m²) using calibrated scales and stadiometers. Regarding its validity for identifying obesity based on adiposity, a systematic review and meta-analysis reported an overall sensitivity of 50% (95% CI, 43%–57%) and specificity of 86%–94% (Jiménez & Rio-Valle, 2011).

Data were collected through a free online **Google Forms** questionnaire comprising five sections: informed consent; sociodemographic and eligibility information; the PSQI; the PSS-14; and BMI classification based on anthropometric measurements. Participants' weight and height were measured, and BMI was calculated using a digital BMI calculator. Participants then reported the corresponding BMI category in the questionnaire. Data were handled exclusively by the principal investigators to ensure confidentiality and secure data management.

Statistical Analysis

Data were processed using Microsoft Excel and **Jamovi version 2.3.28**. BMI was calculated using the *BMI–Ideal Weight* mobile application. Descriptive and inferential analyses were subsequently performed using the statistical software.

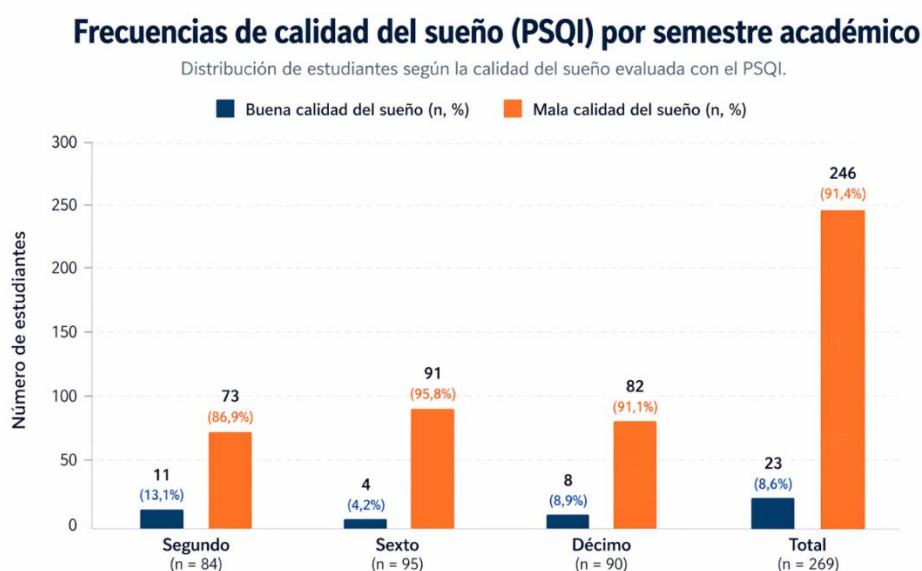
RESULTADOS E DISCUSSÃO

Of the 471 medical students enrolled at Pontificia Universidad Católica del Ecuador (PUCE) across the second, sixth, and tenth semesters, a calculated sample size of 333 participants was established. After applying the eligibility criteria, **269 students were included in the final analysis**. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI).

Overall, 23 students (8.55%) had good sleep quality, including 11 (47.8%) from the second semester, 4 (17.4%) from the sixth, and 8 (34.8%) from the tenth. In contrast, 246 students (91.45%) had poor sleep quality, including 73 (29.7%) from the second semester, 91 (37.0%) from the sixth, and 82 (33.3%) from the tenth.

Poor sleep quality predominated across all academic levels. The highest prevalence was observed in the sixth semester (95.8%), followed by the tenth (91.1%) and second semesters (86.9%). Conversely, good sleep quality was reported by 4.2%, 8.9%, and 13.1% of students in the sixth, tenth, and second semesters, respectively (Table 1).

Figure 2. Frequency of sleep quality categories by academic semester.



Source: Authors' own elaboration.

Perceived Stress

Perceived stress was assessed using the **Perceived Stress Scale (PSS-14)**. Overall, 95.1% of participants (n=256) reported experiencing stress at least occasionally, ranging from “sometimes” to “very often,” whereas 4.9% (n=13) reported rarely or never feeling stressed.

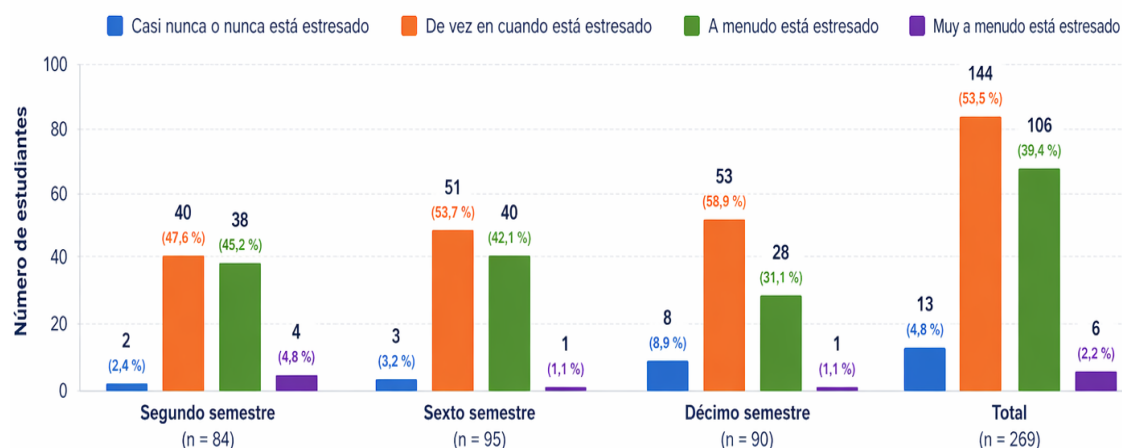
Thirteen participants (4.83%) reported rarely or never experiencing stress, including 2 (15.4%) from the second semester, 3 (23.1%) from the sixth, and 8 (61.5%) from the tenth. A total of 144 participants (53.53%) reported experiencing stress “sometimes,”

including 40 (27.8%), 51 (35.4%), and 53 (36.8%) from the second, sixth, and tenth semesters, respectively. Furthermore, 106 participants (39.41%) reported experiencing stress “often,” including 38 (35.8%), 40 (37.7%), and 28 (26.4%), respectively. Finally, 6 participants (2.23%) reported experiencing stress “very often,” including 4 (66.7%) from the second semester, 1 (16.7%) from the sixth, and 1 (16.7%) from the tenth.

By academic level, the second semester showed the highest stress intensity, with 50.0% of students reporting stress “often” or “very often.” In contrast, the sixth and tenth semesters showed a greater concentration in the “sometimes” category (53.7% and 58.9%, respectively). The tenth semester also had the highest proportion reporting little or no perceived stress (8.9%) (Figure 2).

Figure 3. Distribution of perceived stress by academic semester

PSS-14. Distribución de niveles de estrés por semestre académico



Source: Authors' own elaboration.

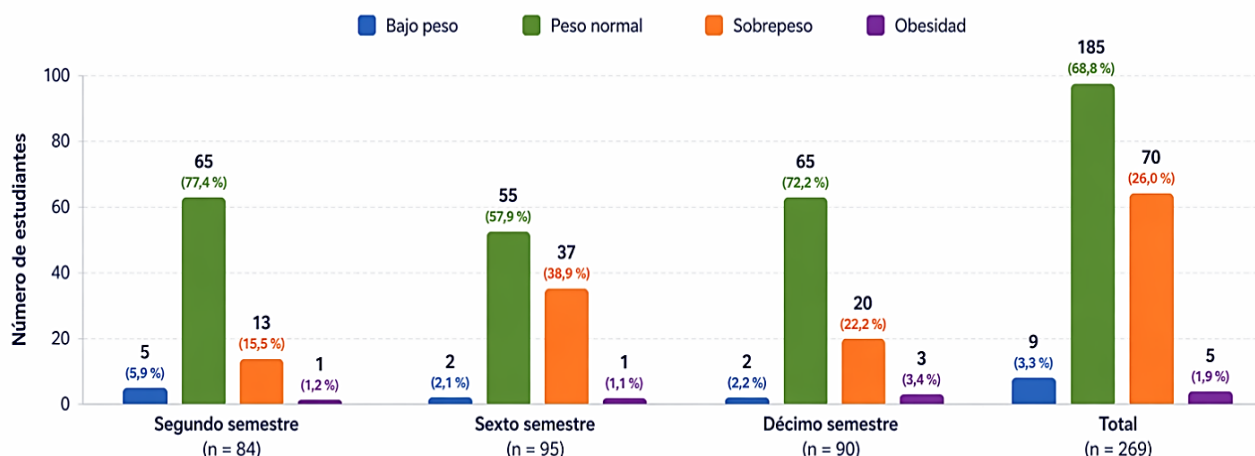
BMI was calculated from measured weight and height. Overall, 9 students (3.3%) were underweight, 185 (68.8%) had normal weight, 70 (26.0%) were overweight, and 5 (1.9%) had obesity (Figure 3).

Among students with underweight, 5 (55.6%) were in the second semester, 2 (22.2%) in the sixth, and 2 (22.2%) in the tenth. Of those with normal weight, 65 (35.1%) were in the second semester, 55 (29.7%) in the sixth, and 65 (35.1%) in the tenth. Among overweight students, 13 (18.6%), 37 (52.9%), and 20 (28.6%) were in the second, sixth, and tenth semesters, respectively. Of the five students with obesity, 1 (20.0%) was in the second semester, 1 (20.0%) in the sixth, and 3 (60.0%) in the tenth.

By academic level, normal weight predominated in the second semester (77.4%). In the sixth semester, overweight increased to 38.9%, coinciding with the highest prevalence of poor sleep quality. In the tenth semester, normal weight remained predominant (72.2%), while obesity reached its highest prevalence (3.4%). Overall, 27.9% of students had a BMI above the recommended range (overweight or obesity).

Figure 4. Distribution of body mass index by academic semester.

IMC (2). Distribución del índice de masa corporal por semestre académico



Source: Authors' own elaboration.

Statistical Analysis and Validation

Associations between categorical variables were assessed using the chi-square test (χ^2) based on contingency tables comparing observed and expected frequencies.

Perceived stress was initially categorized into four levels: rarely or never, sometimes, often, and very often stressed (Remor, 2006). BMI was categorized as underweight, normal weight, overweight, or obesity. For the analyses of sleep quality versus BMI and perceived stress versus BMI, categories were subsequently collapsed into two levels to construct 2x2 contingency tables. This approach reduced the risk of low expected cell frequencies and facilitated compliance with the assumptions of the χ^2 test.

Dichotomization also improved the clinical and epidemiological interpretability of the comparisons, particularly between low versus high perceived stress and normal versus altered BMI, which are relevant health indicators in medical students.

Association Between Sleep Quality and Body Mass Index

A significant association was observed between categorized BMI (underweight/normal weight vs. overweight/obesity) and sleep quality assessed using the Pittsburgh Sleep Quality Index (PSQI) among the 269 participants. The chi-square test showed a statistically significant association ($\chi^2 = 4.60$, $df = 1$, $p = 0.032$) (Table 2).

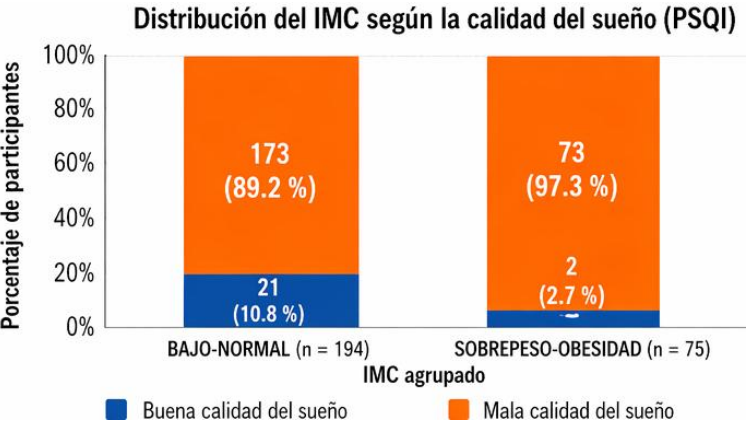
Table 2. Chi-square test for the association between BMI and sleep quality.

Prueba de chi cuadrado (χ^2)			
Parámetro	Valor	gl	p
χ^2 (observado)	4.60	1	0.032
N (total)	269		

Source: Authors' own elaboration.

Among students with low-to-normal BMI ($n = 194$), 89.2% ($n = 173$) had poor sleep quality and 10.8% ($n = 21$) had good sleep quality. Among those with overweight or obesity ($n = 75$), poor sleep quality was more prevalent (97.3%, $n = 73$), while only 2.7% ($n = 2$) reported good sleep quality.

Figure 5. Distribution of BMI categories according to sleep quality..



Source: Authors' own elaboration.

The bar heights in Figure 5 represent the observed percentages. Poor sleep quality was more prevalent among students with overweight or obesity than among those with low-to-normal BMI, suggesting an association between nutritional status and sleep quality in the study population.

Association Between Perceived Stress and Body Mass Index

A significant association was observed between categorized BMI (low-to-normal vs. overweight/obesity) and perceived stress, categorized as low (rarely/never or sometimes stressed) versus high (often or very often stressed), among the 269 participants. The chi-square test showed a statistically significant association ($\chi^2 = 5.86$, $df = 1$, $p = 0.016$) (Table 3).

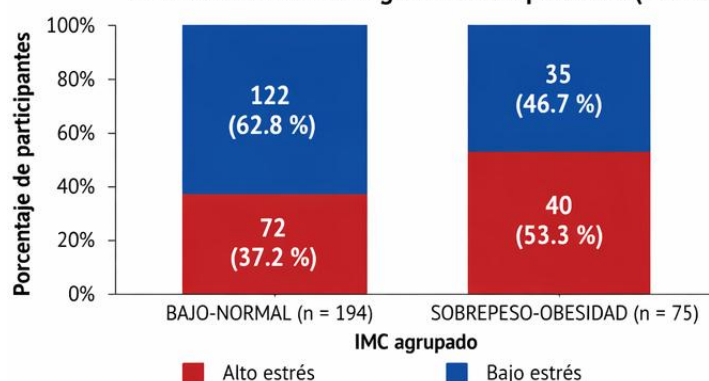
Table 3. Chi-square test for the association between BMI and perceived stress.

Prueba de chi cuadrado (χ^2)			
Parámetro	Valor	gl	p
χ^2 (observado)	5.86	1	0.016
N (total)	269	-	-

Source: Authors' own elaboration.

Among students with low-to-normal BMI ($n = 194$), 62.8% had low perceived stress and 37.2% had high perceived stress. In contrast, among those with overweight or obesity ($n = 75$), 53.3% reported high perceived stress and 46.7% reported low perceived stress.

Figure 6. Distribution of BMI categories according to perceived stress.
Distribución del IMC según el estrés percibido (PSS-14)



Source: Authors' own elaboration.

The bar heights in Figure 6 represent the observed percentages. Students with overweight or obesity showed a higher proportion of high perceived stress compared with those with low-to-normal BMI. These findings support the study hypothesis and indicate a statistically significant association between nutritional status and perceived stress in the study population.

DISCUSSION

This study identified a high prevalence of poor sleep quality (91.45%) among medical students, substantially exceeding estimates reported in other populations. In Spain, approximately 48.7% of participants were classified as having poor sleep quality (Fuentes-Senise & García-Corpas, 2022), while studies among university students have reported prevalences ranging from 60% to 85%. Similarly, 45% of undergraduate medical students at KIIT University reported poor sleep quality during the COVID-19 confinement period (Mishra et al., 2022b). The higher prevalence observed in the present study may reflect the demanding academic workload, irregular schedules, and nighttime study habits characteristic of medical training.

Perceived stress was also highly prevalent, with 95.1% of participants reporting some degree of stress, predominantly occasional or frequent. This finding is consistent with evidence identifying medical students as particularly vulnerable to stress due to academic demands, performance pressure, and continuous assessment. Notably, students in earlier academic levels showed greater stress intensity, which may be related to adaptation to the university environment and initial academic demands (Pérez-Pulido, 2016).

Regarding nutritional status, 68.8% of participants had normal BMI, whereas 27.9% were classified as overweight or obese. This proportion is clinically relevant and may reflect lifestyle factors such as irregular eating patterns, sedentary behavior, stress, and sleep disturbances, which have been described among university students (Maza-ávila et al., 2022).

A statistically significant association was observed between sleep quality and BMI ($p = 0.032$). Poor sleep quality was more prevalent among students with overweight or obesity (97.3%) than among those with low-to-normal BMI (89.2%). These findings are consistent with Hernández et al. (2019), who described an association between sleep disturbances and increased body weight, potentially mediated by hormonal changes involving decreased leptin and increased ghrelin, which may promote appetite and caloric

intake. However, the magnitude of this association has varied across studies, with some reporting increased risks of up to 66%, suggesting that the relationship may depend on population and contextual factors.

Perceived stress was also significantly associated with BMI ($p = 0.016$), with a higher proportion of elevated stress among students with overweight or obesity. This finding is consistent with evidence linking chronic stress to metabolic alterations through sustained activation of the hypothalamic–pituitary–adrenal axis and increased cortisol secretion, which may promote adiposity, particularly abdominal fat accumulation.

In an Ecuadorian study of predominantly young adults aged 18–30 years, 36.8% of participants had overweight or obesity and 77.5% reported moderate perceived stress, with women being more affected. However, no significant associations were identified between sex and BMI or between sex and perceived stress (Carpio Arias et al., 2023).

Conversely, a university-based study reported moderate stress in 72.6% of students and poor sleep quality in 72.8%, with a significant correlation between higher stress and poorer sleep ($p = 0.0001$). However, no significant associations were found between BMI and perceived stress or between BMI and sleep quality ($p = 0.141$ and $p = 0.872$, respectively) (Faris et al., 2025). These discrepancies may reflect differences in study design, sample size, variable classification, and sociodemographic characteristics.

Overall, the present findings demonstrate statistically significant associations between BMI and both sleep quality and perceived stress. Although the cross-sectional design precludes causal inference, the results highlight the potential interrelationship of these factors in medical students. These findings support the need for multidimensional strategies addressing sleep hygiene, stress management, and healthy lifestyle behaviors within medical education settings.

CONSIDERAÇÕES FINAIS

Poor sleep quality was highly prevalent among medical students (91.4%), with the highest prevalence observed in the sixth semester. Perceived stress was also highly prevalent, affecting more than 90% of participants, with greater intensity observed among students in earlier academic levels.

Although normal BMI predominated, 27.9% of students were classified as overweight or obese, with overweight most prevalent in the sixth semester and obesity in the tenth semester.

Significant associations were identified between BMI and sleep quality ($p = 0.032$) and between BMI and perceived stress ($p = 0.016$). These findings suggest that sleep quality, perceived stress, and nutritional status are interconnected health indicators among medical students. However, given the cross-sectional design, causal relationships cannot be established.

Institutional strategies addressing sleep hygiene, stress management, physical activity, and healthy dietary behaviors may help promote the overall health and well-being of medical students.

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