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Sociodemographic, Health Behavior, and Psychological Factors Associated with Poor Sleep Quality Among Psychology Students at a Brazilian Public University

Fatores Sociodemográficos, Comportamentos de Saúde e Fatores Psicológicos Associados à Má Qualidade do Sono entre Estudantes de Psicologia de uma Universidade Pública Brasileira

Sociodemográficos, Conductas de Salud y Factores Psicológicos Asociados con la Mala Calidad del Sueño en Estudiantes de Psicología de una Universidad Pública Brasileña

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Abstract: To examine the associations between poor sleep quality and sociodemographic characteristics, sleep hygiene, sleep deprivation, and mental health among undergraduate psychology students at a Brazilian university. This was a quantitative descriptive cross-sectional study with a convenience sample of 130 psychology students (73.8% women, *M*=21, *SD*=2.6). Participants completed measures on sociodemographic characteristics, sleep quality, deprivation, and hygiene, health behaviors, self-efficacy, and stress. Multiple regression analysis using Wald chi-square test demonstrated that male sex (p<.01), older age (p<.05), higher stress (p<.001), and non-smoking (p<.05) were associated with poorer sleep quality, while greater weekly working hours (p<.01), better sleep hygiene (p<.05), and higher self-efficacy (p<.05) were associated with better sleep quality. Findings reiterate the relevance of social, psychological, and behavioral factors in comprehending sleep quality.

Keywords: Mental Health; Psychology; Stress Psychological; Sleep Quality; Students.

Resumo: Examinar as associações entre a má qualidade do sono e características sociodemográficas, higiene do sono, privação de sono e saúde mental em estudantes de graduação em psicologia de uma universidade brasileira. Esse é un studo quantitativo descritivo transversal com amostra de conveniência de 130 estudantes de psicologia (73,8% mulheres, *M*=21, *DP*=2,6). Os participantes responderam instrumentos sobre características sociodemográficas, qualidade, privação e higiene do sono, comportamentos de saúde, autoeficácia e estresse. Análise de regressão múltipla utilizando o teste qui-quadrado de Wald demonstrou que sexo masculino (p<0,01), idade avançada (p<0,05), altos níveis de estresse (p<0,001) e não fumar (p<0,05) foram associados com pior qualidade do sono.

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Enquanto, mais horas de trabalho semanais (p<0,01), melhor higiene do sono (p<0,05) e maior autoeficácia (p<0,05) foram associados com melhor qualidade do sono. Resultados reiteram a relevância de fatores sociais, psicológicos e comportamentais para compreender a qualidade do sono.

Palavras-chave: Saúde Mental; Psicologia; Estresse Psicológico; Qualidade do Sono; Estudantes.

Resumen: Examinar las asociaciones entre la mala calidad del sueño y las características sociodemográficas, la higiene del sueño, la privación del sueño y la salud mental en estudiantes de psicología de una universidad brasileña. Este es un studio cuantitativo descriptivo transversal con una muestra por conveniencia de 130 estudiantes de psicología (73,8% mujeres, M=21, DE=2,6). Los participantes completaron medidas sobre características sociodemográficas, calidad, privación y higiene del sueño, conductas de salud, autoeficacia y estrés. Análisis de regresión múltiple mediante la prueba chi-cuadrado de Wald demonstró que sexo masculino (p<0,01), edad avanzada (p<0,05), estrés más elevado (p<0,001) y no fumar (p<0,05) estaban asociados com peor calidad del sueño. Por el contrario, más horas de trabajo semanales(p<0,01), mejor higiene del sueño (p<0,05) y mayor autoeficacia (p<0,05) estaban asociados com mejor calidad del sueño. Estos hallazgos sugieren la importancia de intervenciones dirigidas a mejorar la higiene y hábitos de sueño saludables, la gestión del estrés y la autoeficácia em estudiantes. Resultados reafirman la relevancia de los factores sociales, psicológicos y conductuales para comprender la calidad del sueño.

Palabras clave: Salud Mental; Psicología; Estrés Psicológico; Calidad de sueño; Estudiantes.

Worldwide, university students, including psychology students are strongly affected by poor sleep quality (Humphries et al., 2022; Li et al., 2020; Lund et al., 2010; Mendes et al., 2019; Zochil & Thorsteinsson, 2018), who often experience insomnia and excessive daytime sleepiness (Choueiry et al., 2016; Mendes et al., 2019; Montagni et al., 2020, Souza et al., 2013). Poor sleep quality is associated with decreased academic performance (Li et al., 2020; Lund et al., 2010; Okano et al., 2019) and increased risk for mental and physical health problems among university students (Lund et al., 2010; Zhang et al., 2018), including antisocial personality, anxiety, attention deficit/hyperactivity, and depressive disorder, and somatic complaints (Choueiry et al., 2016; Li et al., 2020; Montagni et al., 2020; Zochil & Thorsteinsson, 2018).

Sleep quality is influenced by multiple factors. According to the biopsychosocial model of sleep, sleep is multidimensional and influenced by the interplay of biological, psychological, and social factors (Perrault et al., 2025). Consistent with this framework, sleep quality among university students has been associated with sociodemographic characteristics, health behaviors, and psychological factors. Evidence regarding the relationship between sociodemographic factors and sleep quality remains inconsistent. While a study indicated no significant influence of gender, age, and ethnicity on poor sleep quality (Lund et al., 2010), others observed worse sleep quality among female (Carone et al., 2020; Li et al., 2020; Montagni et al., 2020), Black (Carone et al., 2020), older, and employed students (Silva et al., 2022).

Health behaviors, particularly sleep hygiene and sleep habits, also affect sleep quality. Sleep hygiene refers to practicing physical exercise, avoiding eating before bed, adopting regular sleep schedules, reducing light and noise, and avoiding coffee, alcohol, and nicotine (De Pasquale et al., 2024). Furthermore, poor sleep habits involve later bedtime wake-up schedule and insufficient sleep duration (< 7 hours per day) (Watson et al., 2015), which are common among university students and contribute to worse sleep outcomes (Doolin et al., 2018; Humphries et al., 2022; Lund et al., 2010; Mendes et al., 2019; Montagni et al., 2020; Okano et al., 2019; Wang & Bíró, 2021; Zhang et al., 2018).

Psychological factors also play a critical role in sleep quality. Stress, which is highly prevalent among psychology students (Andrade et al., 2016; Bacchi & Licinio, 2017; Doolin et al., 2018; Matsinhe et al., 2020) due to academic demands (Andrade et al., 2016; Beiter et al., 2015; Vizzotto et al., 2017), has been highlighted as a strong predictor of poor sleep quality (Lund et al., 2010; Wang & Bíró, 2021). In contrast, individuals with higher self-efficacy may engage in adaptive coping behaviors facing stress and academic demands, which has been associated with reduced sleep disorders and better sleep quality (Dehghan et al., 2022; Przepiórka et al., 2019).

Attending psychology school involves significant life changes that can be overwhelming, may potentially affect health behaviors, mental health

and sleep quality. Despite the high prevalence of stress (Andrade et al., 2016; Bacchi & Licinio, 2017; Doolin et al., 2018; Matsinhe et al., 2020) and poor sleep quality (Humphries et al., 2022; Zochil & Thorsteinsson, 2018), many psychology students do not seek mental health support (Thomas et al., 2014), potentially exacerbating sleep problems, impairing academic performance, and reducing overall wellbeing. Understanding the factors associated with poor sleep quality among this population is relevant to identify vulnerable groups, target modifiable behaviors, and inform best interventions to enhance academic and wellbeing. However, few studies have simultaneously investigated the sociodemographic, behavioral, and psychological factors associated with poor sleep quality among psychology students. Therefore, this study aimed to examine the associations between poor sleep quality and sociodemographic characteristics, sleep hygiene, sleep deprivation, and mental health among undergraduate psychology students at a Brazilian university.

Method

Participants

A quantitative descriptive cross-sectional study was carried out with a convenience sample. The sample consisted of 130 undergraduate students enrolled in a psychology program from a large, public university in Brazil. Participants were eligible if they were at least 18 years old, enrolled as a regular undergraduate student in the psychology program; and presented in the classroom at the time of data collection.

The sample had a mean age of 21 years (*SD* = 2.6). The majority of students were female (73.8%), white (79.2%), and single (96.9%), reported not having a religion (63.1%) and unemployed (60.8%), and indicated that their mothers had completed higher education (63.1%). Among those who worked, the number of hours worked per week was 5.7 (*SD* = 10.6). Regarding housing, 78.5% of the students had moved from another to attend university; 56.6% lived with friends, and 94.6% lived off campus (Table 1).

Table 1 - *Sociodemographic Characteristics of Participants*

Variable	*n*	%
Age *M* (*SD*)	21.2 (2.6)	-
Sex		
Female	96	73.8
Male	34	26.2
Race		
White	103	79.2
Mixed-race	13	10.0
Asian	10	7.7
Black	4	3.1
Marital Status		
Single	126	96.9
Married	4	3.1
Religion		
Yes	48	36.9
No	82	63.1
Mother's Education		
Higher Education	82	63.1
None (or lower than higher education)	48	36.9
Employed		
Yes	51	39.2
No	79	60.8
Weekly Working Hours M (SD)	5.7 (10.7)	-
Moved from Another City to Attend University		
Yes	102	78.5
No	28	21.5
Living Status		
Friends	73	56.2
Family	44	33.8
Alone	12	9.2
Missing	1	0.8
Living on Campus		
Yes	7	5.4
No	123	94.6
Academic Year		
1st year	28	21.5
2nd year	29	22.3
3rd year	31	23.9
4th year	27	20.8
5th year	15	11.5

Procedures

Undergraduate students enrolled in a psychology program were invited to participate in the study. Professors volunteered their classes in advance. Core classes were conveniently selected. The questionnaire was administered in the same way within the various classes. All students completed the questionnaire in their classroom after reading and signing the informed consent form. This study was approved by the Research Ethics Committee of the University of Sao Paulo (CAAE 04393118.0.0000.5407). It took participants approximately 25 minutes to complete the questionnaire.

Measures

Sociodemographic information. Participants indicated their age, sex (biological sex at birth), race, marital status, religion, mothers' highest education, employment, whether they had moved from another city to attend university, current living status, and academic year (Doolin et al., 2018).

Poor sleep quality. This index was computed by summing the values assigned by the participants in the questions: (1) in a typical week, how many nights do you have trouble sleeping?; (2) on an average night, how many times do you wake up after falling asleep?; (3) on an average night, how long does it usually take you to fall asleep after you close your eyes?; and (4) on an average day, how often do you feel tired or sleepy? (Doolin et al., 2018). The index ranged from 3 to 19, with a higher score indicating greater poor sleep quality.

Sleep deprivation. Sleep deprivation was calculated by subtracting the number of hours of sleep required to function well the next day from the number of hours a participant normally gets in a typical night (Doolin et al., 2018). The scores were reversed to facilitate interpretation, with higher scores indicating greater sleep deprivation.

Sleep hygiene. This index was created by summing three multiple-choice questions related to the participants' sleep-promoting routine (Doolin et al., 2018). Responses ranged from "never" to "always" regarding whether the participant (1) goes to bed at the same time every night; (2) maintains a regular sleep-wake schedule throughout the week and weekends; and (3) worries about not getting enough sleep. Higher scores indicated better sleep hygiene, with a possible range of 3 to 12.

Health behaviors. Participants were asked whether they practiced physical exercises and smoked cigarettes in a typical week (yes; no). Additionally, the participants indicated on a 3-point Likert scale the number of alcoholic drinks consumed in a typical week (from 0-2; 3-6; 7-15); where a drink was defined as 12 ounces of beer, 5 ounces of wine, and 1.5 ounces of spirits.

Perceived health. Participants marked on a 4-point Likert scale how they perceived their health (from "poor" to "excellent") (Doolin et al., 2018). The score had a possible range of 1 to 4.

Stress: The Perceived Stress Scale (PSS – 10) was used to assess how much the participants considered their lives to be uncontrollable, unpredictable, and overloaded (Faro, 2015). This is a 10-item scale with responses ranging from "never" to "always". In the present study, internal consistency (Cronbach's alpha) was .79, similar to what was reported by Doolin et al. (2018).

Self-efficacy: The participants indicated their agreement on a 5-point Likert scale (from "strongly agree" (1) to "strongly disagree" (5)) with the statement "I do not believe that I can reduce the stressors in my life." A higher score indicated higher levels of self-efficacy (Doolin et al., 2018).

Data Analysis

The IBM SPSS version 23.0 and RStudio R v.4.5.1 were used to perform the data analysis. A significance level of $< .05$ was set for all analyses. Due to the right skewness of the dependent variable and the presence of only positive values, models with a normal distribution and generalized linear models with a Gamma distribution were compared. All models included the same structure of variables. Identity and log link functions were tested for the Gamma model. Model selection considered the Akaike Information

Criterion (AIC), the plausibility of the fitted values, graphical inspection of residuals, and the influence of extreme cases. Further, the Gamma model with an identity link function showed the lowest AIC and did not produce negative fitted values, and was therefore retained as the main model. Sensitivity analyses were conducted to assess the stability of the coefficients after removing cases with the greatest influence.

An adjusted associative model for poor sleep quality was obtained by performing multiple regression analysis using the Wald chi-square test with backward variable selection. The variables with the highest *p*-values were removed one by one, retaining in the final model only those with $p \leq .10$. Bonferroni's post-hoc comparisons were performed when necessary.

Results

The participants reported moderate sleep quality ($M = 8.6$, $SD = 3.1$), mean sleep deprivation of 1.6 hours ($SD = 1.3$), moderate sleep hygiene ($M = 7.0$, $SD = 1.8$), moderate stress ($M = 23.2$, $SD = 6.3$), high self-efficacy ($M = 4.0$, $SD = 1.0$), and perception of health between good and average ($M = 2.7$, $SD = 0.8$). Regarding health behaviors, most of the students did not practice physical exercise (61.8%), did not smoke cigarettes (80.9%), and drank between 0 to 2 alcoholic drinks during the week (52.7%, Table 2).

Table 2 - Sleep, Mental Health, and Health Behaviors Measures

Variables	*n*	%
Poor Sleep Quality M (SD)	8.6 (3.1)	-
Sleep Hygiene M (SD)	7.0 (1.8)	-
Sleep Deprivation M (SD)	1,6 (1.3)	-
Stress M (SD)	23,2 (6.3)	-
Self-Efficacy M (SD)	4,0 (1.0)	-
Perceived Health M (SD)	2,7 (0.8)	-
Physical Exercise		
Yes	47	35.9
No	81	61.8
Missing	2	2.3
Smoking Cigarettes		
Yes	24	18.5
No	106	81.5
Alcoholic Drinks		
0-2 drinks	68	52.3
3-6 drinks	39	30.0
7 or more drinks	22	16.9
Missing	1	0.8

The Gamma model with an identity link function showed the best comparative fit according to the AIC (AIC = 621.91), compared to the normal linear model (AIC = 629.94) and the Gamma model with a log link (AIC = 626.09). The dependent variable had strictly positive values, and the fitted values from the Gamma identity model ranged between 4.30 and 15.02, with no negative predictions. Inspection of the residuals did not indicate serious patterns of misspecification, although some cases with higher influence were identified. In a sensitivity analysis, the effects retained their direction and remained statistically significant; therefore, the model was retained.

The final multiple regression model indicated that male sex ($M_{estimated} = 9.49$; $\beta = -1.54$; CI [-2.59, -0.48]; $\chi^2_{Wald}(1) = 8.19$, $p < .01$) and non-smoking habit ($M_{estimated} = 9.31$; $\beta = -1.17$; CI [-2.31, -0.02]; $\chi^2_{Wald}(1) = 3.99$, $p < .05$) were significantly associated with higher mean poor sleep quality scores. Higher weekly working hours ($\beta = -.06$; CI [−0.10, −0.03]; $\chi^2_{Wald}(1) = 11.42$, $p < .01$), better sleep hygiene ($\beta = -.35$; CI [−0.64, −0.07]; $\chi^2_{Wald}(1) = 5.82$, $p < .05$), and higher levels of self-efficacy ($\beta = -.58$; CI [−1.09, −0.07]; $\chi^2_{Wald}(1) = 4.90$, $p < .05$) were significantly associated with lower mean poor sleep quality scores. Conversely, older age ($\beta = .26$; CI [0.05, 0.48]; $\chi^2_{Wald}(1) = 5.81$, $p < .05$) and higher levels of stress ($\beta = .17$; CI [0.10, 0.24]; $\chi^2_{Wald}(1) = 24.53$, $p < .001$) were significantly associated with higher poor sleep quality scores (Table 3).

Table 3 - Adjusted associative model for Poor Sleep Quality among Psychology Students

Variables	Factors	Estimated mean	β	*df*	*Wald* χ^2	*p*	Wald 95% CI	
							LL	UL
Intercept	-	-	4.86	1	1.87	0.174	-2.10	11.83
Sex								
	Male	9.49	-	-	-	-	-	-
	Female	7.96	-1.54	1	8.19	0.005	-2.59	-0.48
Academic Year								
	1st year	7.93	-0.60	1	0.39	0.531	-2.48	1.28
	2nd year	8.95	0.42	1	0.20	0.657	-1.44	2.29
	3rd year	8.20	-0.33	1	0.14	0.706	-2.02	1.36
	4th year	10.01	1.48	1	2.91	0.091	-0.22	3.18
	5th year	8.53	-	-	-	-	-	-
Smoking Cigarettes								
	No	9.31	-		-	-	-	-
	Yes	8.14	-1.17		3.99	0.048	-2.31	-0.02
Alcoholic Drinks								
	0-2 drinks	8.14	-	-	-	-	-	-
	3-6 drinks	9.34	1.21	1	4.53	0.035	0.10	2.32
	7 or more drinks	8.69	0.55	1	0.73	0.395	-0.72	1.82
Age	-	-	0.26	1	5.81	0.017	0.05	0.48
Weekly Working Hours	-	-	-0.06	1	11.42	0.001	-0.10	-0.03
Stress	-	-	0.17	1	24.53	<0.001	0.10	0.24
Sleep Hygiene	-	-	-0.35	1	5.82	0.017	-0.64	-0.07
Self-efficacy	-	-	-0.58	1	4.90	0.029	-1.09	-0.07

An effect of the academic year was also observed in the model, the 4th year students demonstrated a tendency for higher mean poor sleep quality scores than the students from the other years. However, Bonferroni's post-hoc comparisons indicated that this effect was not significant.

Discussion

The findings of this study were consistent with the biopsychosocial model of sleep, showing that multiple dimensions were associated with poorer sleep quality reported by participants. Consistent with previous studies (Okano et al., 2019; Vizzotto et al., 2017), the results showed that male students had a significantly higher estimated mean poor sleep quality score. However, the literature demonstrates mixed results regarding the relationship between the sleep quality of university students and sex. Some studies reported no differences in sleep quality between sexes (Choueiry et al., 2016; Lund et al., 2010), while others reported higher poor sleep quality scores among women (Carone et al., 2020; Li et al., 2020; Montagni et al., 2020) and among men (Okano et al., 2019; Vizzotto et al., 2017). A previous study showed that poor sleep habits, including shorter sleep duration and greater sleep irregularity, was associated with poor sleep quality among men (Okano et al., 2019). Additionally, within the biopsychosocial model of sleep, literature suggests that sex-based differences in biological factors, such as circadian system and metabolism, may affect self-reported sleep quality and prevalence

of sleep outcomes (Lok et al., 2024).

Older students reported poorer sleep quality. The literature presents discrepant results regarding the effect of age on the sleep quality of university students. A study described no differences in sleep quality across age groups (Choueiry et al., 2016). Souza et al. (2013) indicated a greater tendency to sleepiness among younger students, whereas Silva et al. (2022) showed that increasing age was related to shorter sleep duration among nursing students. Although not assessed in the present study, evidence shows that aging affects neurobiological mechanisms underlying sleep outcomes (Carrier et al., 2017).

The results showed that lower weekly working hours were associated with poorer sleep quality. However, this finding should be interpreted with caution, as weekly working hours may reflect a range of related factors not assessed in this study. Literature has shown that poor sleep is influenced by multiple work-related variables, such as profession, work climate, time pressure, and job satisfaction (Fietze et al., 2022). Therefore, the mechanisms underlying this association cannot be determined from the present sample and should be further investigated.

Non-smoking was associated with poorer sleep quality. This finding was unexpected, as evidence suggests that nicotine consumption is associated with reduced sleep hygiene, directly interfering with sleep quality (Carone et al., 2020; De Pasquale et al., 2024; Wang & Bíró, 2021). Given this inconsistency, the present result may be particular of this sample and should be interpreted with caution.

Better sleep hygiene was associated with lower levels of poor sleep quality, consistent with previous research (Doolin et al., 2018; Humphries et al., 2022; Li et al., 2020). Inadequate sleep hygiene, including substance use, lack of physical exercise, irregular sleeping schedules, using the bed for activities other than sleep, engaging in stimulating activities around bedtime (e.g., watching television, studying, using a cellphone), and worrying before bed, has been previously described by university students (Humphries et al., 2022; Li et al., 2020; Lund et al., 2010).

In line with previous studies (Alotaibi et al., 2020; Lund et al., 2010; Wang & Bíró, 2021), stress was associated with poor sleep quality. Consistently, undergraduate psychology students reported high levels of stress (Andrade et al., 2016; Bacchi & Licinio, 2017; Doolin et al., 2018; Matsinhe et al., 2020). The academic milieu is overloaded with many risk factors for stress, such as the pressure for high academic performance and success (Beiter et al., 2015; Limone & Toto, 2022), overwhelming workload, challenging changes (Andrade et al., 2016; Bacchi & Licinio, 2017; Vizzotto et al., 2017), evaluations, and concerns for the professional future (Bacchi & Licinio, 2017; Beiter et al., 2015). Undergraduate students also highlighted as stressful specific characteristics of a Brazilian psychology program, such as assessments centered at the end of the semester and very basic subjects concentrated in the initial years (Andrade et al., 2016).

Conversely, higher self-efficacy was associated with lower levels of poor sleep quality. These results are consistent with previous studies showing that self-efficacy is a protective factor for sleep quality and efficiency (Dehghan et al., 2022; Przepiórka et al., 2019). Indeed, high self-efficacy improves the management of challenging situations, stress control (Timkova et al., 2020), and engagement in healthy lifestyles (Bektas et al., 2021).

Consistent with prior research (Alotaibi et al., 2020; Dehghan et al., 2022; Lund et al., 2010; Przepiórka et al., 2019; Wang & Biró, 2021; Zhang et al., 2018), better sleep hygiene, lower stress levels, and higher self-efficacy were associated with lower poor sleep quality scores, suggesting that behavioral and psychological factors play an important role in sleep quality. Although the current findings are not sufficient to support programmatic recommendations, they highlight domains that may be relevant for intervention development. In this sense, sleep health education programs and initiatives to promote coping strategies, stress management, and self-efficacy represent promising approaches (Bani Issa et al.,

2023; Gaiotto et al., 2021; Lim et al., 2023). However, future studies are needed to test the effectiveness of such interventions to improve sleep quality among Brazilian psychology students.

The results should be interpreted within the limitations of this study. The convenience sample may have introduced bias to the study. Additionally, relying on self-report measures could have led to memory bias. However, the participants had a high level of education and knowledge related to psychological assessments and research methods, which could have increased the objectivity of their responses. The findings are not easily generalizable given that the study was carried out only at one university. The moderate sample size most likely reduced the ability to detect the predictive effect of some variables. For example, although it was hypothesized that the academic year might influence poor sleep quality and the results showed a significant correlation between both variables, Bonferroni's post-hoc comparisons did not reveal a significant difference. The number of participants was moderate, and the Bonferroni correction is quite conservative, both of which could have impaired the power of the test and might explain the lack of significant differences. Future studies should include larger samples and multicenter investigations to confirm the findings of the present study. Given the cross-sectional design, causal relationships cannot be drawn, highlighting the importance of longitudinal research with larger samples to better understand how sociodemographic, behavioral, and psychological factors influence changes in sleep quality over time. Another limitation of this study is the lack of assessment of biological factors related to sleep quality, which should be examined in future studies alongside these variables.

Final Considerations

This study investigated the associations between poor sleep quality and sociodemographic characteristics, sleep hygiene, sleep deprivation, and mental health among undergraduate psychology students of a Brazilian university. A notable strength of this study lies in its pre-COVID-19 data collection, ensuring that the findings remain unaffected by the considerations arising from pandemic-related shutdowns. The results showed that sex, age, smoking cigarettes, weekly working hours, sleep hygiene, self-efficacy, and stress were associated with poor sleep quality. These findings reiterate the relevance of social, psychological, and behavioral factors in comprehending sleep quality. They also highlight potential groups at higher risk for poor sleep quality, such as older male students. Additionally, this study suggests factors that warrant further investigation through longitudinal and experimental studies among psychology students.

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