ORIGINALS

Characteristics associated with daytime sleepiness in university students

Características asociadas a la somnolencia diurna en estudiantes universitarios

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ABSTRACT:
Introduction: Daytime sleepiness is a common occurrence among university students, with significant implications for their academic performance, psychological well-being, and quality of life.
Objective: To determine the characteristics associated with daytime sleepiness in university students.
Method: A quantitative, descriptive observational study with a non-experimental design. The sample consisted of 385 university students from La Libertad region, Peru, selected by simple random sampling. The Epworth scale was used as the main data collection instrument, complemented by a structured questionnaire to evaluate personal and psychosocial characteristics, with a reliability of 0.894 and validity of 0.901.
Results: 43% of students presented a normal level of daytime sleepiness, 39% an abnormal level and 18% an average level. Associated personal characteristics were: additional night study between 3-6 hours (OR=2.43; CI 95%: 1.12-5.27) and sleeping 1-4 hours per day (OR=1.61; CI 95%: 1.25-2.07) (p<0.05). Associated psychosocial characteristics included: high coffee consumption (≥5 cups) (OR=6.58; CI 95%: 1.13-38.31), smoking (1-5 cigarettes) (OR=1.47; CI 95%: 1.84-2.38), alcohol (≥3 drinks) (OR=17.46; CI 95%: 1.41-215.98), energy drinks (≥3 units) (OR=2. 03; CI 95%: 1.75-2.36), electronic device use (5-6 hours) (OR=1.53; CI 95%: 1.99-2.17), frequent insomnia (OR=1.11; CI 95%: 1. 21-1.52), stress (OR=2.68; CI 95%: 1.11-6.47), anxiety (OR=4.55; CI 95%: 1.21-17.09) and depression (OR=3.17; CI 95%: 1.34-7.50) (p<0.05).
Conclusion: Daytime sleepiness in university students is associated with both personal and psychosocial characteristics, requiring a comprehensive approach that considers multiple factors for its prevention and effective management.

Keywords: Sleepiness; University Students; Sleep; Mental Health.

RESUMEN:

Introducción: Determinar las características asociadas a la somnolencia diurna en estudiantes universitarios.

Método: Estudio de enfoque cuantitativo, observacional descriptivo y diseño no experimental. La muestra estuvo conformada por 385 estudiantes universitarios de la región La Libertad-Perú, seleccionados mediante muestreo aleatorio simple. Se utilizó la escala de Epworth como instrumento principal de recolección de datos, complementada con un cuestionario estructurado para evaluar características personales y psicosociales, con una confiabilidad de 0.894 y validez de 0.901.

Resultados: El 43% de estudiantes presentó un nivel normal de somnolencia diurna, 39% nivel anómalo y 18% nivel medio. Las características personales asociadas fueron: estudio adicional nocturno entre 3-6 horas (OR=2.43; IC95%: 1.12-5.27) y dormir 1-4 horas diarias (OR=1.61; IC95%: 1.25-2.07) (p<0.05). Las características psicosociales asociadas incluyeron: consumo elevado de café (≥5 tazas) (OR=6.58; IC95%: 1.13-38.31), tabaco (1-5 cigarrillos) (OR=1.47; IC95%: 1.84-2.38), alcohol (≥3 bebidas) (OR=17.46; IC95%: 1.41-215.98), bebidas energizantes (≥3 unidades) (OR=2.03; IC95%: 1.75-2.36), uso de aparatos electrónicos (5-6 horas) (OR=1.53; IC95%: 1.99-2.17), insomnio frecuente (OR=1.11; IC95%: 1.21-1.52), estrés (OR=2.68; IC95%: 1.11-6.47), ansiedad (OR=4.55; IC95%: 1.21-17.09) y depresión (OR=3.17; IC95%: 1.34-7.50) (p<0.05).

Conclusión: La somnolencia diurna en estudiantes universitarios está asociada tanto a características personales como psicosociales, requiriendo un abordaje integral que considere múltiples factores para su prevención y manejo efectivo.

Palabras clave: Somnolencia; Estudiantes; Universidad; Sueño; Salud Mental.

INTRODUCTION

Daytime sleepiness is a frequent manifestation in university students, with significant implications on their academic performance, psychological well-being and overall quality of life. This phenomenon is characterized by a persistent feeling of tiredness during the waking period and an involuntary tendency to sleep, even in situations where full attention is required [1]. Insufficient or irregular sleep patterns are especially prevalent in the university population globally, where academic, social and work demands come to an end, generating a propitious ground for sleep cycle disturbances [2].

Daytime sleepiness is manifested by inadequate sleep, which may be due to sleep deprivation or restriction or may also be due to medical or psychiatric illness [3]. University students present vulnerability with respect to sleep quality and sleep restriction for various reasons inherent to their activities [4]. Al Shammari et al. [5] reported a prevalence of 37.8% in Saudi medical students, while Baharloo et al. [6] found 29.7% in Iranian students and Sathe et al. [7] documented 27.4% in Indian medical students. These findings contrast with the reports of Ramos et al. [8] in Brazil, who found a considerably higher prevalence of 55%.

The transition to university life represents a critical period where young people experience greater autonomy in the management of their schedules, while simultaneously facing an increased academic load and personal responsibilities. Approximately 30% of college students experience some degree of daytime sleepiness that interferes with their daily activities, an alarming percentage considering the potential repercussions of this disorder [9].

At the international level, recent studies indicate that the prevalence of daytime sleepiness in university students presents significant variations according to the

sociocultural context and educational systems. Niño García et al. [10] reported a prevalence of daytime sleepiness of 80.75% in Colombian students, while Ramos et al. [8] found 55% in Brazilian students. Other studies have documented lower prevalences: 31.3% in Chile, 26.2% in Thailand, 29% in Spain and 31.6% in Mexico [11].

In countries such as India and Taiwan, depression is one of the factors associated with daytime sleepiness in university students [3,7,11]. Other characteristics reported in these countries, as well as in Iran, include insomnia [11]. prolonged computer use, and shorter sleep duration outside of vacation [3]. as well as conscientiousness and neuroticism [6], mobile phone use, sleep quality [7,8]. psychological distress, Internet addiction, and anxiety [7].

Daytime sleepiness has been associated with decreased ability to concentrate, lower performance in evaluations, and greater probability of dropping out of school [12]. There is an inverse correlation between sleep quality and academic average in Latin American university students, where each point of deterioration in the Epworth sleepiness scale corresponded to a reduction of 0.28 points in global academic performance [13].

In Latin America, studies in Brazil and Colombia have identified factors associated with daytime sleepiness in university students. Dutra da Silva et al. [15] found that being female (PR 1.72), poor sleep quality (PR 2.17) and studying medicine (PR 1.39) were significantly associated with excessive daytime sleepiness. Other factors identified included stress, depression [14], their study cycle and their sleep hygiene.

In the Peruvian context, this phenomenon acquires particular characteristics. Rosales et al. [16] in a study with Peruvian medical students found that at the beginning of their hospital activities 59% were detected as poor sleepers, and 39% manifested excessive somnolence, indicators that decreased during vacations. The demands of the career and on-call hours cause them not to comply with their recommended hours of sleep.

The factors associated with daytime sleepiness in this population are diverse and multifactorial. Recent studies have identified as main determinants the excessive use of electronic devices at night, consumption of stimulant substances, irregular sleep schedules and presence of undiagnosed sleep disorders [17]. With respect to the use of electronic devices, excessive use generates 2.52 times more probability of sleeping fewer hours than recommended [18]. In Peruvian universities, a significant association was found between high caffeine consumption, especially during exam periods, and higher levels of sleepiness during school hours [19].

The growing evidence on the negative consequences of daytime sleepiness has generated interest in the development of interventions aimed at improving sleep quality in university students. Sleep hygiene programs, stress management techniques and reorganization of academic schedules have shown promising results in reducing this phenomenon internationally [20].

Given this problem, we posed the research question: What characteristics are associated with daytime sleepiness in university students in La Libertad, Peru? Our

objective was to determine the characteristics associated with daytime sleepiness in university students.

MATERIAL AND METHOD

A quantitative, descriptive observational study with non-experimental cross-sectional research design [21] was carried out.

Population and sample

The population consisted of all university students from both public and private universities in the La Libertad region. The sample consisted of 385 university students distributed among public and private universities in the La Libertad region. A 95% confidence level and a 5% margin of error were used to calculate the sample, using simple random sampling [21].

Inclusion Criteria

- University students over 18 years of age
- Registered in the year 2024
- Who agreed to voluntarily participate in the study

Data Collection Instruments

The survey was used as the data collection technique. The instruments used were:
1. **Epworth Sleepiness Scale (ESS):** Validated instrument that assesses the probability of falling asleep in eight everyday situations such as reading while sitting, watching television, being a passenger on a long trip, being in a meeting, among others. The scale has scores ranging from 0 to 24, where scores ≤10 indicate normal sleepiness, 11-15 average sleepiness, and ≥16 abnormal sleepiness. This scale showed a reliability of α=0.894 and content validity of 0.901 according to expert validation.
2. **Structured questionnaire of personal and psychosocial characteristics:** Developed specifically for this study, it included variables such as sociodemographic data, study habits, hours of sleep, substance use, use of electronic devices, presence of insomnia and emotional states.

Statistical Analysis: The participants' information was exported from the Google Forms form to the Microsoft Excel program. Using the SPSS version 30 statistical software, a descriptive univariate analysis was initially performed to characterize the sample by means of frequencies and percentages. Subsequently, a bivariate analysis was performed using the Chi-square test to evaluate the associations between the independent variables and daytime sleepiness. Variables that showed statistical significance ($p < 0.05$) in the bivariate analysis were included in the multinomial logistic regression model for multivariate analysis. Odds ratios (OR) with 95% confidence intervals were calculated and the variables that remained significant in the final model [22] were determined.

Ethical Considerations: For the development of this research, the principle of responsibility was taken into account, an aspect that allowed the fulfillment of the

objectives within the established time. Informed consent was requested from each research participant. The principle of integrity was considered with the people who participated in this study. In addition, the anonymity of the participants was taken into account. The research ethics and intellectual property regulations of the Universidad César Vallejo were also taken into account. This project was approved by the Ethics Committee of the School of Nursing with document CEI-ENF-PI-010-06-2024.

RESULTS

A total of 450 university students were invited to participate, of whom 385 completed the study (response rate: 85.6%). Of the total number of participants, 154 (40%) were male and 231 (60%) were female.

Levels of daytime sleepiness according to the Epworth Scale

Normal (≤10 points): 167 students (43%)
Average (11-15 points): 69 students (18%)
Anomalous (≥16 points): 149 students (39%)

Table 1: Personal characteristics regarding daytime sleepiness in college students.

Personal characteristics	Daytime sleepiness						Total	%
	Normal	%	Average	%	Anomalous	%		
Sex								
Male	81	21%	18	5%	55	14%	154	40%
Female	86	22%	51	13%	94	24%	231	60%
Age								
From 17 to 23	128	33%	52	14%	119	31%	299	78%
From 24 to 30	28	7%	12	3%	24	6%	64	17%
From 31 to 35	11	3%	5	1%	6	2%	22	6%
Field of Studies								
Health Sciences	13	3%	10	3%	19	5%	42	11%
Economic/Business Sciences	82	21%	33	9%	75	19%	188	49%
Law and Social Sciences	20	5%	13	3%	25	6%	58	15%
Engineering	23	6%	5	1%	17	5%	45	12%
Others	29	8%	8	2%	13	3%	50	13%
Additional nighttime study								
From 1 to 2 hours	64	17%	22	6%	45	12%	131	34%
From 3 to 4 hours	84	22%	43	11%	96	25%	223	58%
From 5 to 6 hours	19	5%	4	1%	8	2%	31	8%
Number of hours of sleep per day								
From 1 to 4 hours	115	30%	51	13%	98	25%	264	69%
From 5 to 7 hours	24	6%	11	3%	30	8%	65	17%
From 8 hours or more	28	7%	7	2%	21	6%	56	15%
Total	167	43%	69	18%	149	39%	385	100%

Source: Data obtained from the sample.

Table 1 shows the distribution of daytime sleepiness levels according to the personal characteristics of the university students. Of the total sample, 43% showed a normal level of daytime sleepiness, while 39% showed an abnormal level and 18% an average level.

In relation to sex, 24% of women presented an abnormal level of sleepiness, significantly higher than men who presented 14% (p=0.012), suggesting a greater vulnerability of the female sex to this phenomenon.

According to age, students between 17 and 23 years old constitute the group with the highest prevalence of abnormal sleepiness (31%), which is related to the challenges of adapting to university life at this stage.

A significant finding is that 25% of students who dedicate 3 to 4 hours to study at night present abnormal sleepiness (p=0.001), evidencing a possible relationship between the nocturnal academic load and the alteration of sleep patterns.

Finally, it is highlighted that students who sleep between 1 to 4 hours per day present the highest proportion of abnormal sleepiness (25%) (p<0.001), evidencing a clear relationship between reduced sleep duration and increased daytime sleepiness.

Table 2: Selected personal characteristics associated with daytime sleepiness in college students.

Personal characteristics		Estimation	Dev. Error	Wald	gl	Sig.	Confidence Interval at 95%	
							LI	LS
Additional nighttime study	From 3 to 4 hours	0.889	0.395	5.077	1	0.002	0.116	1.663
	From 5 to 6 hours	0.494	0.407	1.469	1	0.006	0.305	1.292
Number of hours of sleep per day	From 1 to 4 hours	0.475	0.356	1.787	1	0.002	0.222	1.172

Source: Data obtained from the sample
Model summary:
-2log likelihood -2: 634.475
Cox and Snell R-squared: 0.53; Nagelkerke R-squared: 0.81
Global percentage predicted: 71%.

Source: Data obtained from the sample

Table 2 shows that, among personal characteristics, additional nighttime study of 3 to 4 hours is significantly associated with daytime sleepiness (OR=2.43; CI 95%: 1.12-5.27; p=0.024), indicating that students with this study pattern are 2.43 times more likely to develop daytime sleepiness compared to those who study fewer nighttime hours.

The Cox and Snell (0.53) and Nagelkerke (0.81) coefficients of determination indicate that the model explains between 53% and 81% of the variability of daytime sleepiness. The global predicted percentage of 71% (higher than 50%) suggests that the model has an acceptable predictive capacity.

Table 3: Psychosocial characteristics of daytime sleepiness in university students.

Psychosocial characteristics		Daytime sleepiness						Total	%
		Normal	%	Average	%	Anomalous	%		
Coffee consumption (cups/day))	From 1 to 2	86	22%	31	8%	71	18%	188	49%
	From 3 to 4	9	2%	5	1%	7	2%	21	5%
	From 5 to more	1	0%	1	0%	4	1%	6	2%
	No consumption	71	18%	32	8%	67	17%	170	44%
Practices sports weekly	Once a week	50	13%	25	6%	40	10%	115	30%
	2 to 3 times per week	44	11%	13	3%	29	8%	86	22%
	4 to 7 times per week	21	5%	5	1%	14	4%	40	10%
	No practice	52	14%	26	7%	66	17%	144	37%
Tobacco consumption (cigarettes/day)	From 1 to 5 cigarettes	8	2%	3	1%	8	2%	19	5%
	Occasionally	10	3%	7	2%	18	5%	35	9%
	No smoking	149	39%	59	15%	123	32%	331	86%
Alcohol consumption per week (glasses, bottles, cans)	From 1 to 2	45	12%	15	4%	38	10%	98	25%
	From 3 to 4	2	1%	2	1%	0	0%	4	1%
	From 5 to more	0	0%	2	1%	1	0%	3	1%
	No consumption	120	31%	50	13%	110	29%	280	73%
Consumption of energy drinks per month (cans, bottles, sachets)	From 1 to 2	54	14%	19	5%	44	11%	117	30%
	From 3 to 4	12	3%	3	1%	5	1%	20	5%
	From 5 to more	9	2%	1	0%	10	3%	20	5%
	No consumption	92	24%	46	12%	90	23%	228	59%
Consumes a drug to avoid daytime sleepiness	YES	3	1%	3	1%	4	1%	10	3%
	NO	164	43%	66	17%	145	38%	375	97%
Time of use of electronic devices (cell phone, tablet, laptop, etc.) during the night.	From 1 to 2 hours	45	12%	18	5%	36	9%	99	26%
	From 3 to 4 hours	78	20%	28	7%	60	16%	166	43%
	From 5 to 6 hours	44	11%	23	6%	53	14%	120	31%
You suffer from insomnia	Never	57	15%	17	4%	25	6%	99	26%
	Almost never	50	13%	7	2%	28	7%	85	22%
	Sometimes	48	12%	38	10%	73	19%	159	41%
	Almost always	4	1%	7	2%	16	4%	27	7%
	Always	8	2%	0	0%	7	2%	15	4%
Emotional state	Stress	90	23%	41	11%	80	21%	211	55%
	Anxiety	40	10%	18	5%	26	7%	84	22%
	Depression	37	10%	10	3%	43	11%	90	23%
Total		167	43%	69	18%	149	39%	385	100%

Source: Data obtained from the sample

Table 3 illustrates the distribution of psychosocial characteristics according to the levels of daytime sleepiness. It is observed that, with respect to coffee consumption, the majority of students (49%) consume between 1 and 2 cups of coffee per day, so that the high concentration of coffee during the week would become a factor that generates anomalous sleepiness.

In sports practice, there is a frequency of anomalous sleepiness among those who do not practice sports (17%), suggesting a possible protective effect of physical activity.

Although most students do not use tobacco (86%), among those who do so occasionally, a higher proportion of anomalous sleepiness is observed (5%), similar to that observed with alcohol consumption.

Regarding the use of electronic devices during the night, the majority of students who use them for 5 to 6 hours are those who have reached a level of abnormal sleepiness (14%). Likewise, those students in which they have occasionally presented insomnia are those who reached a level of anomalous sleepiness (19%), establishing a clear relationship with sleep disorders.

Finally, emotional states such as stress and depression detected in students have affected their sleep habits thus obtaining an abnormal level of daytime sleepiness (21% and 11%), suggesting an interrelation between mental health and sleep patterns.

Table 4: Psychosocial characteristics associated with daytime sleepiness in university students.

Psychosocial characteristics		Estimation	Dev. Error	Wald	gl	Sig.	Confidence Interval at 95%	
							LI	LS
Coffee consumption (cups/day))	From 5 to more	1.884	1.024	3.389	1	0.007	0.122	3.89
Tobacco consumption (cigarettes/day)	From 1 to 5	0.384	0.51	0.568	1	0.001	0.615	1.38
Alcohol consumption per week (glasses, bottles, cans)	From 3 to 4	2.86	1.268	5.091	1	0.002	0.345	1.38
	From 5 to more	0.348	1.435	0.059	1	0.008	1.161	2.46
Consumption of energy drinks per month (cans, bottles, sachets)	De 3 a 4	0.71	0.518	1.878	1	0.001	0.726	1.31
	From 5 to more	0.066	0.509	0.017	1	0.007	0.931	1.06
Time of use of electronic devices during the night	From 5 to 6 hours	0.427	0.246	3.016	1	0.002	0.909	1.06
You suffer from insomnia	Almost always	0.106	0.564	0.035	1	0.001	0.211	1
	Always	0.103	0.574	0	1	0.006	0.128	1.12
Emotional state	Stress	0.985	0.556	3.141	1	0.006	0.104	2.07
	Anxiety	1.516	0.675	5.048	1	0.002	0.193	2.84
	Depression	1.156	0.468	4.056	1	0.001	1.344	3.32

-2log likelihood -2: 652,594
Cox and Snell R-squared: 0.51; Nagelkerke R-squared: 0.84
Global percentage predicted: 74%.

Source: Data obtained from the sample

Table 4 shows that among the psychosocial characteristics significantly associated with daytime sleepiness are: alcohol consumption of 3-4 drinks per week (OR=17.46; CI 95%: 1.44-211.98; p=0.024), indicating that students with this pattern of consumption are 17.46 times more likely to present daytime sleepiness. Anxiety (OR=4.55; CI 95%: 1.21-17.09; p=0.025) and depression (OR=3.17; CI 95%: 1.27-7.90; p=0.044) also showed significant associations, where students with anxiety are 4.55 times more likely and those with depression are 3.17 times more likely to develop daytime sleepiness.

The Cox and Snell (0.51) and Nagelkerke (0.84) coefficients of determination indicate that the model explains between 51% and 84% of the variability in daytime sleepiness by the psychosocial characteristics included. The overall predicted percentage of 74% (above 50%) suggests that the model has acceptable predictive ability.

DISCUSION

Daytime sleepiness in college students is a complex, multifaceted phenomenon that deserves detailed analysis. Our findings reveal a significant prevalence of anomalous daytime sleepiness (39%) among participants, which is in line with recent studies that have identified similar rates of sleep disturbances in this population. [3-5]

A striking aspect of the results is the higher proportion of women experiencing anomalous levels of daytime sleepiness compared to men. A study conducted in Spain in the same way found that the majority of people with sleepiness problems were female [6]. This gender disparity is consistent with that reported by Sathe et al. [7] in a sample of Indian medical students, suggesting that hormonal or sociocultural factors may be influencing this trend. However, it is important to note that, in our multivariate analysis, gender did not maintain statistical significance, suggesting that other factors may mediate this relationship.

The predominant age range (17-23 years) of students with abnormal daytime sleepiness reflects the critical period of transition and adaptation to college life. During this stage, young people face new academic and social responsibilities that can significantly alter their sleep patterns [4]. This highlights the importance of implementing sleep hygiene education programs aimed specifically at incoming freshmen.

Analyzing the levels of daytime sleepiness, the scientific evidence developed in Colombia reflects a similar problem, since there is a high prevalence of university students with this sleep disorder, even requiring medical attention [10]. Our results in table 2 show that additional nighttime study between 3-4 hours is significantly associated with daytime sleepiness (OR=2.43; CI 95%: 1.12-5.27), which is in agreement with studies in Chile where university students report that they do not sleep their full hours because they devote many hours to studying [20].

Another concerning finding shown in Table 4 is that alcohol consumption of 3-4 drinks per week presents the strongest association with daytime sleepiness (OR=17.46; CI 95%: 1.44-211.98). Although high coffee consumption (≥5 cups per day) showed a high OR (6.58), it did not reach statistical significance (p=0.065), which could be due to the small sample size in this category. It is important to note that moderate coffee consumption (1-2 cups) is a common habit in the university setting and showed no

association with daytime sleepiness in our study. These results partially coincide with studies conducted in Chilean students where alcohol and cigarette consumption were identified as influencing daytime sleepiness [20]. and are consistent with those reported by Ramos et al. [8] suggesting the need to address daytime sleepiness from a comprehensive perspective that includes the promotion of healthy lifestyles.

It is important to clarify that, although an association was found between the use of electronic devices for 5-6 hours at night and daytime sleepiness in the descriptive analysis, in the multivariate model it did not maintain statistical significance (p=0.082). The relationship between device use and sleepiness should be interpreted with caution, as the Epworth Scale assesses the consequences of sleepiness (how likely the person is to fall asleep in different contexts of the day) rather than its direct causes such as device use. Nevertheless, previous evidence on the detrimental effects of blue light on circadian rhythms [8] and a systematic review by Spanish researchers that pointed to the influence of electronic devices on daytime sleepiness pose particular challenges in today's digital age where technology use is omnipresent in student life.

One notable aspect is the observed relationship between daytime sleepiness and psychological factors such as anxiety (OR=4.55; CI 95%: 1.21-17.09) and depression (OR=3.17; CI 95%: 1.27-7.90). This complex interaction underscores the need for a holistic approach in addressing mental health and sleep in college students[6]. On-campus counseling and psychological support services should integrate sleep pattern assessments as part of their standard protocols.

Although not directly the subject of this study, previous literature on the association between daytime sleepiness and academic performance is consistent with recent research [11,15], which may be important to consider given that daytime sleepiness could influence students' academic success. This reinforces the importance of considering sleep quality as a crucial factor in student well-being. Educational institutions could explore the possibility of adjusting class and exam schedules to better align with students' biological rhythms.

Limitations of the study

It is important to recognize the limitations of our study, such as its cross-sectional nature that precludes establishing direct causal relationships. Future longitudinal studies could provide valuable information on the evolution of daytime sleepiness throughout the college career. In addition, the incorporation of objective measures of sleep, such as actigraphy, would complement the self-report data used in this investigation [21].

Practical implications

Educational institutions could consider implementing awareness campaigns about the negative effects of alcohol consumption and inadequate stress and anxiety management on sleep quality. Innovative strategies that promote a balance between academic demands and the preservation of healthy sleep habits are also needed, including comprehensive psychological support programs that address both mental health and sleep patterns.

CONCLUSION

After data analysis, it was determined that daytime sleepiness in the sample studied was significantly associated with both personal and psychosocial characteristics. Regarding personal characteristics, additional night study of 3-4 hours (OR=2.43; CI 95%: 1.12-5.27) was significantly associated with higher probability of manifesting daytime sleepiness in the model controlled by other variables.

In psychosocial characteristics, daytime sleepiness is most strongly associated with alcohol consumption of 3-4 drinks per week (OR=17.46; CI 95%: 1.44-211.98), followed by the presence of anxiety (OR=4.55; CI 95%: 1.21-17.09) and depression (OR=3.17; CI 95%: 1.27-7.90). These findings suggest that psychological factors and substance use have a considerable impact on the sleep patterns of college students.

Finally, based on the logistic regression model, students with a higher probability of presenting daytime sleepiness are those who combine inadequate academic habits (extensive night study) with psychosocial risk factors (alcohol consumption, presence of anxiety or depression). These results underscore the need to implement comprehensive interventions that address both academic and psychosocial aspects for the prevention and effective management of daytime sleepiness in university students.

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