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Revista Hacia la promoción de la SALUD

ISSN: 0121-7577 e-ISSN: 2462-8425

Prevalence and Factors Associated with Sleep Health Literacy among Dentistry, Nursing, and Psychology Students

Received February 28, 2025, accepted August 12, 2025

How to cite
Campo-Arias A, Herazo E, Pedrozo-Pupo JC. Prevalence and Factors Associated with Sleep Health Literacy among Dentistry, Nursing, and Psychology Students. Hacia Promoc. Salud. 2025; 30(2): 33-42. DOI: 10.17151/hpsal.2025.30.2.4

Abstract

Objective: To determine the prevalence and factors associated with sleep health literacy among university students in Santa Marta, Colombia. **Methodology:** A cross-sectional study was conducted with students enrolled in nursing, dentistry, and psychology programs. Sleep health literacy was assessed using the Sleep Beliefs Scale (Kuder–Richardson reliability coefficient = 0.78). **Results:** The study included 346 students aged 18 to 45 years (M = 20.73, SD = 3.08); 70.52% were female. Scores on the Sleep Beliefs Scale ranged from 0 to 20 (M = 11.05, SD = 3.91). The proportion of correct responses varied from 10.41% (item 15, "getting up when it is difficult to fall asleep") to 87.86% (item 19, "sleeping in a quiet, dark room"). A total of 178 students (55.44%) demonstrated limited sleep health literacy. Psychology students obtained higher literacy scores than those enrolled in nursing and dentistry (Pearson $\chi^2 = 8.47$, $p = 0.02$). **Conclusion:** A considerable proportion of nursing, dentistry, and psychology students presented limited sleep health literacy. Further research is required to clarify associated factors and to strengthen educational interventions that promote adequate sleep health literacy among university populations.

Keyword

Literacy; sleep; prevalence; risk factors; university students; cross-sectional studies (Source: *MeSH, NLM*).

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Prevalencia y factores asociados a alfabetización en salud del sueño en estudiantes de enfermería, odontología y psicología

Resumen

Objetivo: determinar la prevalencia y los factores asociados a la alfabetización en salud del sueño en estudiantes universitarios de Santa Marta, Colombia. **Metodología**: se diseñó un estudio transversal en el que participaron estudiantes de enfermería, odontología y psicología. La alfabetización en salud del sueño se cuantificó con la Escala de Creencias sobre el Sueño (Kuder-Richardson de 0,78). **Resultados**: participaron 346 estudiantes entre 18 y 45 años (M = 20,73; DE = 3,08); 70,52 % eran mujeres. Las puntuaciones en la Escala de Creencias sobre el Sueño se observaron entre cero y 20 (M = 11,05; DE = 3,91. Las respuestas correctas estuvieron entre 10,41 % (ítem 15, "levantarse cuando es difícil conciliar el sueño") y 87,86 % (ítem 19, "dormir en una habitación tranquila y oscura"); y 178 estudiantes (55,44 %) puntuaron para limitada alfabetización en salud del sueño. Los estudiantes de psicología mostraron mejor alfabetización que los estudiantes de enfermería y odontología (chi-cuadrado de Pearson = 8,47; p = 0.02). **Conclusiones**: un alto porcentaje de estudiantes de enfermería, odontología o psicología presenta limitada alfabetización en salud de sueño. Se necesitan más estudios en esta área de conocimiento.

Palabras clave

Alfabetización; sueño; prevalencia; factores de riesgo; estudiantes universitarios; estudios transversales (Fuente: *DeCS, MeSH, BIREME*).

Prevalência e fatores associados à alfabetização em saúde do sono entre estudantes de odontologia, enfermagem e psicologia

Resumo

Objetivo: Determinar a prevalência e os fatores associados à alfabetização em saúde do sono entre estudantes universitários em Santa Marta, Colômbia. **Metodologia**: Foi elaborado um estudo transversal no qual participaram estudantes de enfermagem, odontologia e psicologia. A alfabetização em saúde do sono foi quantificada usando a Escala de Crenças do Sono (Kuder-Richardson 0,78). **Resultados**: 346 estudantes entre 18 e 45 anos participaram (M = 20,73; DP = 3,08); 70,52 % eram mulheres. As pontuações na Escala de Crenças do Sono variaram de zero a 20 (M = 11,05; DP = 3,91). As respostas corretas variaram de 10,41 % (item 15, "levantar quando é difícil adormecer") a 87,86 % (item 19, "dormir em um quarto silencioso e escuro"), e 178 estudantes (55,44 %) pontuaram alfabetização limitada em saúde do sono. Estudantes de psicologia demonstraram melhor alfabetização do que estudantes de enfermagem e odontologia (qui-quadrado de Pearson = 8,47; p = 0,02). **Conclusão**: Muitos estudantes de enfermagem, odontologia e psicologia têm alfabetização limitada em saúde do sono. Mais estudos são necessários nesta área de conhecimento.

Palavras-chave

Alfabetização; sono; prevalência; fatores de risco; estudantes universitários; estudos transversais (Fonte: *DeCS, MeSH, BIREME*).

Introduction

"Sleep health literacy" refers to the capacity to understand, seek, evaluate, and apply information related to sleep health. This competence enables individuals to make informed decisions about sleep hygiene, prevent sleep disorders, and promote adequate sleep, thereby improving or maintaining quality of life (1).

Sleep health literacy entails comprehension of standard sleep patterns and cycles, awareness of the symptoms of sleep disorders, familiarity with sleep-promoting practices, recognition of the consequences of sleep deprivation and disorders, and the ability to critically appraise information on sleep within a broader health-literacy framework (2).

Several instruments have been developed to quantify sleep health literacy, including the *Sleep Beliefs Scale* (SBS) (3), the *Sleep Hygiene Index* (SHI) (4,5), the *Dysfunctional Beliefs and Attitudes about Sleep Scale* (DBAS) (6), the *Sleep Attitudes and Practices Questionnaire* (SPAQ) (7), and the *Sleep Health Literacy Scale* (SHLS) (8).

The present study employed the *Sleep Beliefs Scale*, a 20-item instrument that assesses knowledge of substances, behaviors, and situations that may influence sleep positively or negatively across three domains: behaviors incompatible with sleep, sleep–wake cycle behaviors, and thoughts and attitudes about sleep (3).

Adan *et al.* (3), in a sample of psychology students from Spain and Italy, reported correct response rates ranging from 43.33% for "vigorous physical exercise before bedtime" (item 3) to 91.96% for "sleeping in a quiet, dark room" (item 19). Škvorc *et al.* (9) found correct response rates between 27.53% for "getting up when it is difficult to fall asleep" (item 15) and 95.56% for "sleeping in a quiet, dark room" (item 19) among Croatian university students. In a French adult sample, Coelho *et al.* (10) observed values between 25.50% for "catching up on lost sleep by sleeping for a long time" (item 20) and 79.78% for "sleeping in a quiet, dark room" (item 19).

These findings suggest that sleep health literacy varies across populations, influenced by social determinants of health (11). The aforementioned studies limited their analyses to item-level response frequencies and did not establish a cut-off point to define adequate sleep health literacy or examine potential associated variables (12).

Assessing sleep health literacy is relevant because approximately 25% of university students report poor sleep quality (13). Moreover, literacy levels vary according to socioeconomic and cultural contexts (14). Inadequate sleep quality negatively affects students' physical, emotional, cognitive, and academic functioning, with broader public health and economic implications (15–18). Strengthening sleep health literacy is therefore essential to promote well-being and academic success among higher- education students (15,19).

The present study sought to determine the prevalence of sleep health literacy among nursing, dentistry, and psychology students at a university in the Colombian Caribbean and to explore its association with demographic characteristics and sleep hygiene, aspects that previous studies did not examine (3,9,10).

Materials and Method

Design and Participants

A cross-sectional study was conducted with adult students enrolled in nursing, dentistry, and psychology programs at a university in Santa Marta, Colombia.

The target sample comprised 323 students, estimated for an expected prevalence of limited sleep health literacy of 30%, a 95% confidence level, and a 5% margin of error (20). This sample size also allowed adjustment for up to five variables potentially associated with limited sleep health literacy, at a ratio of approximately twenty cases per variable (21).

Probability sampling by cluster was applied, using classrooms as clusters. Each cluster was assumed to include approximately 35 students. Participants aged 18 years or older and enrolled in one of the three programs were eligible.

Measurements

Participants completed a structured questionnaire that collected demographic data, including age, sex, family income (low, medium, or high), academic semester (introductory: first to fifth; clinical: sixth to tenth), place of origin (urban or rural), and academic program. Two standardized instruments were included: the *Sleep Hygiene Index (SHI-10)* (4) and the *Sleep Beliefs Scale (SBS)* (3).

Sleep Hygiene Index, SHI-10 (4)

The SHI-10 assesses behaviors that may influence sleep quantity and quality. Each item offers five response options (never to always), scored from 0 to 4, yielding total scores from 0 to 40 (4). The SHI-10 demonstrated high internal consistency in Colombian medical students (22). In the present study, Cronbach's alpha was 0.76, indicating acceptable reliability. Based on interquartile ranges, scores ≥29 (fourth quartile) were classified as poor sleep hygiene.

Sleep Beliefs Scale [SBS] (3)

The SBS comprises 20 items across three dimensions: behaviors incompatible with sleep (items 1, 2, 7, 8, 11, 12, 14, 17); sleep–wake cycle behaviors (items 3, 4, 5, 10, 16, 19, 20); and thoughts and attitudes about sleep (items 6, 9, 13, 15, 18).

Each item offers three response options: "positive effect," "no effect," and "negative effect." The correct response is "negative effect" for all items except 5, 9, 15, and 19. Each correct response is awarded one point (3). In previous research, internal consistency ranged between 0.62 and 0.87 (3,9,10). In the present study, the Kuder–Richardson coefficient, equivalent to Cronbach's alpha, was 0.78.

Participants who answered at least 60% of the items correctly (≥12 points) were categorized as having adequate sleep health literacy. This threshold, commonly applied in Colombian knowledge assessments, was used as a pragmatic criterion, which earlier studies had not adopted (3,9,10).

Procedure

Participants completed the Spanish-language questionnaire online during class sessions. The SBS underwent a rigorous translation and cultural adaptation process following international standards, with independent evaluations by two bilingual professionals and consensus resolution of minor discrepancies (23).

A research assistant explained the study objectives and the questionnaire format. The first section included the informed consent statement. Participants who provided affirmative consent accessed the study variables. The completion time for the full instrument averaged ten minutes.

Data analysis

Qualitative variables were summarized as frequencies and percentages (%), and quantitative variables as means (M) and standard deviations (SD). Odds ratios (OR) with 95% confidence intervals (95% CI) were computed to determine associations between variables, except for the academic program, for which Pearson's chi-square test was also applied (24). An OR was interpreted as indicating a risk association when the lower bound of the 95% CI was equal to or greater than 1.00 (25). Statistical analyses were conducted using IBM SPSS Statistics software (version 26.0) (26).

Ethical considerations

The study protocol received approval from the institutional ethics committee of a Colombian university (Minutes No. 005, ordinary virtual session of June 9, 2022). All participants took part voluntarily and signed an informed consent form prior to inclusion. The study adhered to the ethical principles outlined in national regulations for health research (27) and in international standards for research involving human subjects (28).

Results

The final sample included 346 students aged between 18 and 45 years (M = 20.73, SD = 3.08). Table 1 presents the demographic characteristics of the participants.

Table 1. *Demographic characteristics of participants.*

Variable	Frequency	%
Age (years)		
18-20	207	59.83
≥ 21	139	40.17
Sex		
Female	244	70.52
Male	102	29.48
Program of Study		
Nursing	124	35.84
Dentistry	111	32.08
Psychology	111	32.08
Semester (courses)		
Basics	193	55.78
Clinicians	153	44.22
Place of Origin		
Urban	285	82.37
Rural	61	17.63
Family income		
Low	255	73.70
Medium or high	91	26.30
Sleep hygiene		
Acceptable	268	80.35
Deficient	78	19.65

Source: The authors made the table using data from the research.

Scores on the *Sleep Beliefs Scale* (SBS) ranged from 0 to 20 (M = 11.05, SD = 3.91). The dimension "Sleep-Incompatible Behaviors" (Kuder–Richardson coefficient = 0.78) presented scores between 0 and 8 (M = 4.65, SD = 2.87); "Sleep–Wake Cycle Behaviors" (Kuder–Richardson coefficient = 0.37) ranged from 0 to 7 (M = 4.45, SD = 1.37); and "Thoughts and Attitudes about Sleep" (Kuder–Richardson coefficient = 0.28) ranged from 0 to 5 (M = 2.95, SD = 1.05).

The proportion of correct responses per item varied from 10.41% (item 15, *"getting up when it is difficult to fall asleep"*) to 87.86% (item 19, *"sleeping in a quiet, dark room"*). Table 2 presents the frequency and percentage of correct answers for each item on the SBS.

Overall, 178 students (55.44%) demonstrated limited sleep health literacy, whereas 168 (44.56%) demonstrated adequate literacy.

Table 2. Correct Response to Items in the Sleep Beliefs Questionnaire (SBQ).

Item	*Frequency*	*%*
1. Drinking alcohol at night. [1]	154	44.51
2. Drinking coffee or other caffeinated beverages after dinner. [1]	171	49.42
3. Do intense physical exercise before going to bed. [2]	60	17.34
4. Taking a long nap during the day. [2]	176	50.87
5. Always going to bed and waking up at the same time. [2]	197	56.94
6. Thinking about the next day's commitments before going to sleep. [3]	257	74.28
7. Using sleep medications regularly. [1]	145	41.91
8. Smoking before bed. [1]	182	52.60
9. Relaxing before bed. [3]	289	83.53
10. Going to bed on an empty stomach. [2]	276	79.77
11. Going to bed two hours later than usual. [1]	276	79.77
12. Using the bed for eating, calling, studying, or non-sleep activities. [1]	174	50.29
13. Trying to fall asleep without feeling sleepy. [3]	173	50,00
14. Studying or working intensively until late at night. [1]	276	79.77
15. Getting up when it is difficult to fall asleep. [3]	36	10.41
16. Going to bed two hours earlier than usual. [2]	75	21.68
17. Going to bed immediately after eating. [1]	232	67.05
18. Being worried about not getting enough sleep. [3]	266	76.88
19. Sleeping in a quiet, dark room. [2]	304	87.86
20. Making up for lost sleep by sleeping longer. [2]	104	30.06

Source: The authors made the table using data from the research.

Note: Each correct answer equals 1 point. Total SBS score range: 0–20. Dimensions:

(1) Behaviors incompatible with sleep (items 1, 2, 7, 8, 11, 12, 14, 17);

(2) Sleep–wake cycle behaviors (items 3, 4, 5, 10, 16, 19, 20);

(3) Thoughts and attitudes about sleep (items 6, 9, 13, 15, 18).

In the bivariate analysis, the academic program demonstrated a significant association with limited sleep health literacy (Pearson's $\chi^2 = 8.47$, $p = 0.02$). Compared with psychology students (45 of 111, 40.54%), nursing students (67 of 124, 54.03%) [OR = 1.72, 95% CI: 1.02–2.89] and dentistry students (66 of 111, 59.46%) [OR = 2.15, 95% CI: 1.26–3.68] presented higher proportions of limited literacy.

Sleep health literacy showed no association with age, sex, semester, place of origin, family income, or sleep hygiene. Table 3 presents the odds ratios (OR) and 95% confidence intervals (CI) for all variables. No adjusted analysis was conducted because none of the ORs reached statistical significance.

Table 3. Bivariate Associations with Limited Sleep Health Literacy.

Variable	*OR*	*IC95 %*
Age 18 – 20 years	1.18	0.77 – 1.82
Male sex	1.44	0.90 – 2.30
Semester of basic courses	1.03	0.68 – 1.58
Urban origin	1.42	0.81 – 2.48
Low family income	0.99	0.61 – 1.60
Poor sleep hygiene	0.81	0.49 – 1.35

Source: The authors made the table using data from the research.

Discussion

In this study, 55.44% of nursing, dentistry, and psychology students from Santa Marta, Colombia, demonstrated limited sleep health literacy. Psychology students achieved significantly higher scores than nursing and dentistry students.

Comparison with Previous Research

The proportion of correct responses varied widely, from 10.44% (item 15, "getting up when it is difficult to fall asleep") to 87.86% (item 19, "sleeping in a quiet, dark room"). The overall prevalence of limited literacy (55.44%) indicates that more than half of the participants lacked sufficient knowledge of healthy sleep practices. These findings are not directly comparable with those from studies conducted in other contexts, as previous reports only described the percentage of correct responses without classifying overall literacy levels. For instance, Adan *et al.* (3) reported correct responses between 43.33% ("doing vigorous physical exercise before going to bed") and 91.96% ("sleeping in a quiet, dark room"); Coelho *et al.* (10) reported values between 25.50% ("catching up on lost sleep by sleeping for a long time") and 79.78% ("sleeping in a quiet, dark room"); and Škvorc *et al.* (9) found responses ranging from 27.53% ("getting up when it is difficult to fall asleep") to 95.56% ("sleeping in a quiet, dark room"). Nevertheless, the present results suggest a lower level of sleep health literacy among Colombian university students than that reported in European samples.

The higher literacy among psychology students compared with nursing and dentistry students deserves particular attention. Although dental students might receive less emphasis on sleep-related topics, sleep health directly affects oral health outcomes, such as bruxism and periodontal disease (29). Therefore, similar literacy levels would be expected across all health-related programs.

Moreover, the absence of an association between sleep health literacy (SBS) and sleep hygiene (SHI-10) categories was unexpected. Both instruments are theoretically designed to assess aspects of sleep health; however, they measure distinct constructs. The SBS evaluates conceptual knowledge, whereas the SHI-10 assesses behavioral habits. Differences in scale structure and response options may account for the observed lack of correlation (30). Additional research is required to examine the relationship between both instruments, particularly in Latin American contexts where such analyses remain scarce (12).

Variations in prevalence and associated factors across studies may also reflect the influence of demographic, cultural, and educational contexts. Sleep health literacy, like other forms of health literacy, depends heavily on social determinants such as education, socioeconomic status, and access to health information (15). Further investigations should aim to clarify these relationships and enhance the comparability of findings across populations (12).

Practical Implications

Sleep health literacy constitutes an essential competence for students in health-related fields, including dentistry, given the relationship between sleep and general and oral health (29). Improved literacy in this domain can promote better sleep practices, enhance academic performance, and support physical and psychological well-being (15).

Adequate sleep is a determinant of overall health. Insufficient sleep increases the risk of cardiovascular disease, multimorbidity, and obesity (31–33). The higher literacy observed among psychology students may stem from the relevance of sleep-related knowledge to their training and clinical practice. In psychology, the quantity and quality of sleep are directly associated with mental health outcomes, including anxiety, depression, and self-harm behaviors with suicidal intent (34–36). Therefore, the inclusion of structured educational modules on sleep health in health science curricula may strengthen both clinical competence and self-care among future professionals.

Strengths and Limitations

This study represents the first effort in Latin America to quantify sleep health literacy using the Sleep Beliefs Scale (SBS), to categorize results into limited and acceptable literacy using a 60% accuracy threshold, and to explore associated demographic and behavioral variables. Previous studies limited their analyses to descriptive reporting of correct responses without examining associations with categorical variables (3, 9, 10).

However, the study presents some limitations. Female participants were overrepresented, and only students from three health disciplines were included, excluding medical and non-health students. Differences in literacy may exist across academic programs, as health-related fields theoretically foster greater awareness of sleep health (37). Additionally, the internal consistency of the "sleep–wake cycle behaviors" and "thoughts and attitudes about sleep" subscales was relatively low. Nevertheless, this limitation is minor because the analysis considered each item individually rather than as part of a composite construct (30).

Conclusions

More than half of the undergraduate students in dentistry, nursing, and psychology demonstrated limited sleep health literacy. Psychology students exhibited higher literacy than their peers in other programs. Further studies are required to assess the prevalence and determinants of sleep health literacy using the SBS and other validated instruments in diverse university populations.

Acknowledgments
The authors express their gratitude to the Universidad del Magdalena for funding this project (Unnumbered Resolution of 2023, Vice-Rectorate of Research).

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