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Assessment of Sleep Quality Amongst the Undergraduate Nursing Students at a Medical College in Ghorahi, Dang, Nepal: A Cross-Sectional Study

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Abstract

Introduction: Sleep disorders, affecting nearly one-tenth of adults globally, present in an exacerbated manner in nursing students due to stress, lifestyle, and shift work. Despite numerous studies on sleep quality, data on early-year undergraduate nursing students remain scarce. This study aims to evaluate the sleep quality and its sociodemographic determinants in the undergraduate nursing students.

Methods: An observational, descriptive, cross-sectional study was conducted from October to December 2024, amongst the first and second-year undergraduate nursing students at the School of Nursing, Rapti Academy of Health Sciences. After obtaining ethical clearance, the sociodemographic profile of the participants was collected using a proforma, and sleep characteristics were assessed using the Pittsburgh Sleep Quality Index (PSQI). Prevalence of poor sleep (with 95% confidence intervals) was determined, and its distribution across various sociodemographic characteristics was described.

Results: Among the total 62 participants, with the mean age of 22.2 ± 3.9 years, 98.4% were female. Most of the participants were from Lumbini Province (69.4%), enrolled in BSc Nursing (61.3%), and were in their first year (53.2%). Poor sleep quality (PSQI >5) was observed in 21.6% (95% CI: 11.7%–33.2%), with borderline sleep quality in 16.1%. Poor sleep quality was more prevalent among second-year students (27.6%) and those living at home (22.7%).

Conclusion: Poor sleep quality in nursing students was found to be influenced by marital status, year of study, and living arrangements, stressing the need for targeted interventions to improve sleep hygiene and student well-being early on.

Keywords: Pittsburgh Sleep Quality Index (PSQI); poor sleep quality; undergraduate nursing students

Introduction

Sleep is a vital physiological process essential for overall health.[1,2] Sleep disorders, which affect about 10% of adults globally, are more common in women and disrupt normal sleep patterns, impacting well-being.[3,4] University students, especially nursing students, face higher risks due to stress, anxiety, lifestyle habits, and hormonal changes.[5–7] Irregular shift work among nursing students and professionals further disrupts their circadian rhythm, worsening the issue.[5]

Several studies have highlighted the prevalence of sleep disorders among the nursing and medical students and professionals. In three separate studies, Paudel et al., Van Nguyen et al., and Thapa et al. respectively reported poor sleep quality in 38.2% of medical students at a medical institute in Kathmandu, Nepal; 47% of nursing professionals in Vietnam; and 75% of nurses with shift-related duties at a medical institute in the eastern part of Nepal.[8–10] Further, among the nursing students, Belingheri et al.,[5] Regmi et al.,[11] and Sharma et al.[12] reported the

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prevalence rates of poor sleep quality as 44%, 63.7%, and 38.1%, respectively.

Despite numerous reports documenting sleep disturbances among the general population and university students, including nursing students, there is a significant lack of local data, particularly on undergraduate nursing students in their early academic years. This study seeks to address this gap by evaluating the prevalence of poor sleep quality and its association with sociodemographic characteristics among the undergraduate nursing students at an academic institution in mid-western Nepal.

Methods

This was an observational, descriptive, cross-sectional study designed to assess the sleep quality of undergraduate nursing students through a standardized questionnaire-based survey. Ethical approval was obtained from the Institutional Review Committee of Rapti Academy of Health Sciences (IRC RAHS; Proposal ID: 034-2024; Reference No.: 838). The research was conducted at the School of Nursing, Rapti Academy of Health Sciences (RAHS), from October to December, 2024. At the time of the study, the School of Nursing at RAHS offered two undergraduate programs: Bachelor of Nursing Sciences (BNS) and Bachelor of Science in Nursing (BSc Nursing).

The study population consisted of first and second-year students from both undergraduate nursing programs, BNS and BSc Nursing, who were from diverse regions across the country. The sampling unit was an individual student randomly selected using a stratified random sampling technique, with stratification based on year of study (first or second year) and nursing program stream (BNS or BSc Nursing), ensuring that the minimum required sample size was fairly proportionately distributed across these strata.

The sample size was calculated using the Cochran's formula,[13] with an adjustment for the finite total population of 70 nursing students, or the study population. Based on the reported prevalence of 'poor sleep quality' (63.7%) from Regmi et al.,[11] the final minimum sample size was calculated to be 59. Both male and female students from the first and second years of both programs were included, with the exclusion of participants who had previously been diagnosed with sleep disorders.

After obtaining written, informed consent from eligible participants, they were provided with a data collection form that included sociodemographic information and the Pittsburgh Sleep Quality Index (PSQI) questionnaire.[14] The PSQI is a standardized tool used to evaluate overall sleep quality based on seven key domains: sleep duration, sleep disturbance, sleep latency, daytime dysfunction due to sleepiness, sleep efficiency, overall sleep quality, and the need for sleep medications. Each domain is scored on a scale from 0 to 3, where '0' indicates no difficulty and '3' indicates severe difficulty. The component scores are then summed to create an overall score, which ranges from 0 to 21, with '0' indicating no sleep issues and '21' reflecting severe difficulties across all areas. An overall score above 5 is considered indicative of 'poor sleep quality'. For the purpose of our study, the score of 5 was considered to be the borderline sleep quality, and that below 5, good sleep quality.

Before distributing the questionnaires, each participant was provided with a detailed explanation of the components of the Pittsburgh Sleep Quality Index (PSQI). Participants were then given approximately 15–20 minutes to complete the questionnaire. Anonymity were strictly maintained throughout the study, and it was ensured that the study did not interfere with the participants' academic activities. The study was supervised by the principal investigator and co-investigators, with the ethical conduct of the research overseen by the Institutional Review Committee of Rapti Academy of Health Sciences (IRC RAHS).

Statistical Analysis

The responses collected from each participant on the printed data collection form were entered into spreadsheet software (LibreOffice Calc), where the data were reviewed for inaccuracies and inconsistencies during preliminary analyses. Final data analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 22.0. The analysis included descriptive statistics in accordance with the study design. Continuous variables were summarized using the mean (with standard deviation), and median (with the first and third quartiles: Q1 and Q3, respectively), while categorical variables were presented as frequencies and percentages. The data were effectively presented in tables. The prevalence of 'poor sleep quality' was reported along with its 95% confidence intervals.

Results

Of the total 62 study participants (undergraduate nursing students), 61 (98.4%) were female, and only one participant was male **(Table 1)**. The mean age of the participants was 22.2 ± 3.9 years, with the minimum age being 17 years and the maximum age being 37 years.

As shown in Table 1, the majority of participants were from Lumbini Province (n = 43, 69.4%), enrolled in the BSc Nursing program (n = 38, 61.3%), and were in their first year of study (n = 33, 53.2%). Additionally, 11 participants (17.7%) were married, and most of the participants resided in the hostel (n = 25, 40.3%).

Table 2 illustrates the distribution of sleep quality across various categories, including gender, marital status, province, nursing program stream, year of study, and residence status among the study participants. A total of 13 participants reported a PSQI score greater than 5, resulting in an overall prevalence of poor sleep quality of 21.6% (95% CI: 11.7% - 33.2%). Additionally, 16.1% of participants exhibited borderline sleep quality, with a PSQI score of 5.0.

Table 1: Sociodemographic characteristics of the study participants

S.N.	Variables	Frequency	Percentage
01	**Gender**		
	Female	61	98.4%
	Male	1	1.6%
02	**Marital Status**		
	Single	51	82.3%
	Married	11	17.7%
03	**Province**		
	Koshi	2	3.2%
	Madhesh	4	6.5%
	Bagmati	5	8.1%
	Gandaki	2	3.2%
	Lumbini	43	69.4%
	Karnali	4	6.5%
	Sudurpaschim	2	3.2%
04	**Stream**		
	BSc. Nursing	38	61.3%
	BNS	24	38.7%
05	**Year**		
	First	33	53.2%
	Second	29	46.8%
06	**Resident Status**		
	Hostel	25	40.3%
	Rent	15	24.2%
	Home/Family	22	35.5%

Table 02: Sleep quality in overall participants and across their sociodemographic characteristics

S.N.	Variables	Quality of Sleep			Total
		Good	Borderline	Poor	
	Overall Participants	39 (62.9%)	10 (16.1%)	13 (21.6%)	62
01	**Gender**				
	Female	39 (63.9%)	10 (16.4%)	12 (19.7%)	61
	Male	0 (0.0%)	0 (0.0%)	1 (100.0%)	1
02	**Marital Status**				
	Single	35 (68.6%)	5 (9.8%)	11 (21.6%)	51
	Married	4 (36.4%)	5 (45.5%)	2 (18.2%)	11
03	**Province**				
	Koshi	0 (0.0%)	0 (0.0%)	1 (100.0%)	2
	Madhesh	3 (75.0%)	1 (25.0%)	0 (0.0%)	4
	Bagmati	4 (80.0%)	1 (20.0%)	0 (0.0%)	5
	Gandaki	1 (50.0%)	0 (0.0%)	1 (50.0%)	2
	Lumbini	28 (65.1%)	6 (14.0%)	9 (20.9%)	43
	Karnali	1 (25.0%)	2 (50.0%)	1 (50.0%)	4
	Sudurpas-chim	1 (50.0%)	0 (0.0%)	1 (50.0%)	2
04	**Stream**				
	BSc. Nurs-ing	26 (68.4%)	3 (7.9%)	9 (23.7%)	38
	BNS	13 (52.4%)	7 (29.2%)	4 (16.7%)	24
05	**Year**				
	First Year	23 (69.7%)	5 (15.2%)	5 (15.2%)	33
	Second Year	16 (55.2%)	5 (17.2%)	8 (27.6%)	29
06	**Residence Status**				
	Hostel	16 (64.0%)	4 (16.0%)	5 (20.0%)	25
	Rent	10 (66.7%)	2 (13.3%)	3 (20.0%)	15
	Home/ Family	13 (59.1%)	4 (18.2%)	5 (22.7%)	22

As shown in Table 2, the prevalence of poor sleep quality was 19.7% among female participants, 21.6% among single participants, 20.9% among residents of Lumbini Province, 23.7% among BSc Nursing students, 27.6% among second-year students, and 22.7% among those living with their family or at home. The proportions of participants with borderline sleep quality (PSQI score of 5.0) were 16.4% among females, 45.5% among married participants, 14.0% among participants from Lumbini Province, 29.2% among BNS students, 17.2% among second-year students, and 18.2% among those living at home or with family.

Table 03: Mean (with standard deviation, SD) and median (with quartiles Q1 and Q3) PSQI scores across the sociodemographic characteristics of the study participants

S.N.	Variables	PSQI Score			
		Mean	SD	Median	Q1 – Q3
01	**Gender**				
	Female (n=61)	4.2	2.3	4.0	3.0 – 5.0
	Male (n=1)	6.0	NA	6.0	NA
02	**Marital Status**				
	Single (n=51)	4.1	2.3	3.0	3.0 – 5.0
	Married (n=11)	4.9	1.9	5.0	4.0 – 5.0
03	**Province**				
	Koshi (n=2)	5.5	3.5	5.5	3.0 – NA
	Madhesh (n=4)	3.8	1.0	3.5	3.0 – 4.75
	Bagmati (n=5)	3.2	1.1	3.0	2.5 – 4.0
	Gandaki (n=2)	6.0	2.8	6.0	4.0 – NA
	Lumbini (n=43)	4.3	2.4	4.0	3.0 – 5.0
	Karnali (n=4)	4.5	2.5	5.0	2.0 – 6.5
	Sudurpaschim (n=2)	4.5	2.1	4.5	3.0 – NA
04	**Stream**				
	BSc. Nursing (n=38)	4.2	2.4	3.0	3.0 – 5.25
	BNS (n=24)	4.3	2.0	4.0	3.0 – 5.0
05	**Year**				
	First (n=33)	4.2	2.4	3.0	3.0 – 5.0
	Second (n=29)	4.4	2.1	4.0	3.0 – 6.0
06	**Resident Status**				
	Hostel (n=25)	4.1	1.7	4.0	3.0 – 5.0
	Rent (n=15)	3.7	1.9	3.0	2.0 – 5.0
	Home/Family (n=22)	4.8	2.9	4.0	3.0 – 5.5

Discussion

Sleep is a state of unconsciousness initiated by the body during which the brain enters a restful state while remaining responsive to internal stimuli.[15] Sleep is a crucial physiological process that supports physical and mental health, and quality sleep is directly linked to optimal cardiovascular health, kidney function, immune response, and hormonal balance.[1,2]

Sleep disorders are a constellation of states that interrupt normal sleep activity and are amongst the most frequently encountered issues in a clinical setting. Inadequate sleep can negatively impact physical and mental well-being, with a negative impact on overall health and quality of life. This category includes a range of conditions that can occur in both adults and children, each presenting with various symptoms.[3] Sleep disorders affect millions of people and contribute to various health issues, with insomnia and sleep apnea being among the most common. Globally, chronic insomnia affects approximately 8-10% of adults, with a higher prevalence observed in females.[4]

University students face numerous challenges that greatly elevate their likelihood of developing sleep disorders. Nearly 60% report experiencing poor sleep quality, and around one-third are posed at risk for a minimum of one sleep disorder. Insomnia affects about 8% of these students, a rate similar to that found in the general population.[16] Nursing students are similarly affected, with around one-third exhibiting poor sleep habits and one in four experiencing insomnia.[5] Several factors have been linked to sleep disturbances, including psychological elements like stress, anxiety, and mood changes, as well as individual factors such as hormonal changes, age, lifestyle, diet, smoking, obesity, caffeine intake, genetic predisposition, and lack of physical activity.[6,7] In addition to these factors, irregular shift work among nursing students and professionals further disrupts the circadian rhythm, worsening these issues.[5]

A plethora of research conducted on global, regional, and local scales (that have addressed the issue of poor sleep quality among various professional groups) has prompted this study, which aims to assess the character of sleep in undergraduate nursing students in their first and second academic years.

This study, involving 62 undergraduate nursing students, had a smaller sample size compared to several other studies, such as Van Nguyen et al.[9] (420 nursing professionals), Thapa et al.[10] (148 shift-working nursing professionals), Sharma et al.[12] (105 undergraduate nursing students), Regmi et al.[11] (267 nursing students across seven colleges in Kathmandu), Belingheri et al.[5] (202 nursing students), and Paudel et al.[8] (212 undergraduate medical students). Larger samples, like those in these studies, are likely to offer more generalizable results, strikingly in contrast to the present study.

The study, with a mean age of 22.2 years (range 17–37), is comparable to studies by Sharma et al.[12] (mean age 24.2 years), Regmi et al.[11] (21.2 years), and Belingheri et al.[5] (22.0 years), all involving younger participants. In contrast, Van Nguyen et al.[9] (mean age 32.5 years) included older nursing professionals, while Thapa et al.[10] reported a mix, with most participants aged 20–30 years and one-fourth under 20. These age comparisons highlight that sleep quality issues are prevalent across a range of ages, but younger nursing students, as in the present study, may face specific challenges related to academic stress.

In the present study, most participants were from Lumbini Province, with the study site located within the same province. In contrast, Sharma et al.[12] (2019) conducted their study at a nursing campus in Pokhara, Gandaki Province, though they did not specify the regional origins of their participants. Regmi et al.[11] (2021) studied nursing students from seven colleges in Kathmandu, Bagmati Province, but did not report the specific provinces of their participants. Belingheri et al.[5] (2020) conducted their research at a university in Northern Italy, focusing on a different cultural and educational context. These geographical differences highlight the potential influence of regional factors on sleep quality, suggesting that findings may vary across locations and should be interpreted within their specific contexts. Moreover, these variations in the geography of the study sites justify the design of the present study globally as well as locally.

In the present study, 17.7% of nursing students were married, a figure that was lower as compared to 26.7% as reported in the study by Sharma et al.[12] (2019) but higher than the 7.5% found in Regmi et al.[11] (2021). Regarding living arrangements, most participants in the present study resided in hostels (40.3%), while Sharma et al.[12] found that most students lived with their families (51.4%), and Regmi et al.[11] reported that 69.7% lived with their parents. These differences in marital status and living arrangements of the study participants across different studies suggest the potential impact of each of these factors on the quality of sleep of nursing students.

In this study, 21.6% of undergraduate nursing students reported having poor sleep quality, with 16.1% exhibiting borderline sleep quality. This prevalence is lower than that reported by Paudel et al.[8] (38.2%) among medical students, Regmi et al.[11] (63.7%) among nursing students, and Thapa et al.[10] (75%) among shift-working nursing professionals. However, it is higher than the 9.5% of night-shift nursing students with poor sleep quality reported by Belingheri et al.[5] These variations may be due to differences in participant characteristics, such as the type of student population (nursing vs. medical) and work schedules (shift vs. non-shift). The higher prevalence of sleep disturbances in studies like Thapa et al.[10] and Regmi et al.[11] may reflect the added stress of shift work and academic pressures, while the present study's lower rates suggest that undergraduate nursing students, though affected, may experience less extreme disruptions than shift workers. These comparisons underscore the significant impact of workload and lifestyle on sleep quality.

The subgroup analysis revealed variations in the prevalence of poor sleep quality across different groups. Poor sleep was reported by 19.7% of female participants, 21.6% of single students, 23.7% of BSc Nursing students, 27.6% of second-year students, and 22.7% of those living

with family. These findings highlight the influence of gender, academic year, and living arrangements on sleep quality among nursing students.

The limitations of this study primarily arise from its small sample size, single-center design, and the potential biases inherent in the data collection process. Although the sample size was statistically adequate for calculating the overall prevalence of poor sleep quality, it may not have been sufficient for subgroup analysis, particularly for variables with multiple categories and variables like gender, for which only one male participant was reported in our study. This limits any generalizable inferences regarding gender differences in the outcome of interest. Additionally, since the study was a single-institution-based study, the results possibly lack generalizability to broader populations. Finally, the reported components of sleep quality are subject to unavoidable biases, including those arising from the deliberate misreporting of information by participants.

Despite its limitations, the study has used a probability sampling strategy, which has enhanced the reliability of the findings. Additionally, the study provides valuable information to stakeholders about the pressing issue of sleep quality among key professional trainees, particularly during the early years of their education. The preliminary data can serve as a foundation for policy amendments aimed at addressing this issue and can also open avenues for future research. Further studies could focus on cohorts with poor sleep quality, for example, to explore the association of sleep disturbances with potential predisposing and resulting factors.

Conclusion

This study underscores the notable prevalence of poor and borderline sleep quality among undergraduate nursing students. Factors such as marital status, year of study, and living arrangements were found to influence sleep outcomes, with married students and those living with family reporting the worst sleep quality. These findings emphasize the need for targeted interventions to improve sleep hygiene, particularly in the early years of nursing education. Future research should further explore the factors contributing to sleep disturbances, helping to inform policies that promote better sleep quality and overall well-being among healthcare students.

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