



Original Article



Factors Associated with Sleep Patterns Among Nursing Students: A Cross-Sectional Analysis of Public and Private Colleges

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ABSTRACT

Sleep is a worldwide public health concern and a cost to society. Sleep deprivation can affect people of all ages and demographics. **Objectives:** To analyze the factors associated with sleep patterns among nursing students at a public and private sector nursing college, Karachi. **Methods:** A cross-sectional analytical study design was used to conduct this study in public and private sector nursing schools. A stratified random sampling technique by lottery method was used. The sample size was calculated by using the software "PASS", Version 2021. The calculated sample size was 264, with 80% of power, and 95% confidence interval, and 5% margin of error. This study involved BS Nursing students because they are representative of the target population. To maintain consistency and focus, post-RN and midwifery students were excluded. The study was completed in three months, from July to October, 2025. The Sleep Hygiene Index was utilized to gather the data. The 13 items are scored on a five-point Likert scale ranging from 0 to 4, with higher scores denoting poor sleep hygiene. Every item represents a certain sleep-related activity. **Results:** The majority of participants (72.7%) fall into the good category (23.1%). Individuals were categorized as having normal sleep hygiene, indicating a moderate level of adherence to sleep hygiene guidelines. Only (4.2%) reported poor sleep hygiene, which is indicative of inadequate sleep-related practices. **Conclusions:** There is a difference in sleep patterns in terms of gender and age, and poor sleep affects their academic performance and health quality.

INTRODUCTION

Sleep is a worldwide public health concern and a cost to society. Sleep deprivation can affect people of all ages and demographics. The reversible condition of decreased reactivity to outside stimuli, marked by an altered level of consciousness and unique patterns of brain activity [1]. Sleep is one of the fundamental biological necessities, as essential as food, drink, and air [2]. The individual timing for going to bed and waking up is referred to as the sleep pattern. Furthermore, a circadian rhythm is an internal, natural mechanism that is regulated by a circadian clock that repeats approximately every 24 hours and controls the cycle of sleep and wakefulness [3, 4]. Quality of sleep is an

essential component of a healthy sleep schedule, and chronic sleep deprivation is linked to poorer health among teenagers and young college students. Medical sciences students, who have stress due to exams, suffer serious consequences to their health [5]. Inadequate sleep causes more weariness, irritation, and dysfunction during the day [6]. 40-55% of medical and nursing students self-report having sleep issues [7]. Widespread sleep issues are among medical students in China, 25%, and in Iran, at about 58% [8, 9]. Europe has been found to have the worst sleep quality of any continent [10]. Multiple research studies have been conducted in Pakistan, including Karachi, Peshawar,



and Islamabad, reported the prevalence (>76%), (52.8%), (69.1%), respectively [11, 12].

Sleep disturbances and poor sleep hygiene are increasingly recognized as significant concerns among nursing students due to academic stress, irregular schedules, and lifestyle factors. Although several international studies have examined sleep patterns in medical and nursing students, evidence comparing sleep hygiene across public and private nursing institutions in Pakistan remains limited. Furthermore, the influence of demographic and educational factors on sleep patterns has not been sufficiently explored using standardized assessment tools. Addressing this gap is essential to inform targeted interventions that support students' academic performance and overall well-being. This study aimed to analyze the factors affecting sleep patterns among nursing students at public and private nursing colleges in Karachi, Pakistan.

METHODS

A cross-sectional analytical study was conducted at both public and private sector nursing colleges. A stratified random sampling was utilized by using a lottery-style randomization process. The sample size was calculated by using the software "PASS." Version 2021, using a one-sample t-test with 80% power, 95% CI, 5% margin of error, with a mean score of 32.63 ± 7.05 . Assuming a mean score of 34, the calculated sample size was 210. By adding 20%, the final sample size was 264, divided into two equal strata. This study included BS Nursing students who were willing to participate, and post-RN and midwifery students were excluded. The study was finished in three months, from July to October, 2025. The (SHI) was utilized to gather the data. This tool was developed by Shahid A in 2006 and has been widely used. The 13 items were scored on a five-point Likert scale and had 3 categories. Scores below 26 are considered good, 27-34 are considered normal, and scores above 35 are considered a poor sleep hygiene score and show adequate validity and reliability (Cronbach's alpha of 0.64-0.89). For the current sample, Cronbach's alpha is 0.706. Permission was granted from the IRBs of designated institutes, and written informed consent was obtained from the study participants. The data were analyzed by using SPSS version 26.0, and descriptive statistics were summarized by frequency and percentage. Kolmogorov-Smirnov test was applied, reported ($p=0.091$) for homogeneity of variance, Levene's test was used, categories in continuous data, so an independent t-test, and one-way ANOVA was used.

RESULTS

The study included a total of 264 participants; 100% response rate was observed. In terms of the sector, (50.4%) of the respondents were from private institutions, and

nearly half (49.6%) were from public institutions. Approximately (8.0%) of participants were older than 25, while (92.0%) of participants were 25 years of age or younger. According to gender, there were more female participants (64.0%) than male participants (36.0%). The participants were distributed equally among the first, second, third, and fourth years of the academic year (25.0%)(Table 1).

Table 1: Socio-demographic Characteristics of the Participants

Characteristics	n (%)
Sector	
Public	131 (49.6%)
Private	133 (50.4%)
Age	
≤ 25 Years	243 (92.0%)
> 25 Years	21 (8.0%)
Gender	
Male	95 (36.0%)
Female	169 (64.0%)
Academic Year	
1 st Year	66 (25.0%)
2 nd Year	66 (25.0%)
3 rd Year	66 (25.0%)
4 th Year	66 (25.0%)
Family Type	
Single Parent	42 (15.9%)
Nuclear Family	114 (43.2%)
Joint Family	108 (40.9%)
Marital Status	
Single	234 (88.6%)
Married	30 (11.4%)

The Sleep Hygiene Index (SHI) scores of the research participants are shown in the figure. Three categories, good, normal, and poor sleep hygiene, are used to classify the data. The majority of participants (72.7%) fall into the good category, demonstrating that they continue to follow good sleep habits. A smaller subset of (23.1%) individuals were categorized as having normal sleep hygiene, indicating a moderate level of adherence to sleep hygiene guidelines. Only (4.2%) people reported poor sleep hygiene, which is indicative of inadequate sleep-related practices. (Figure 1).

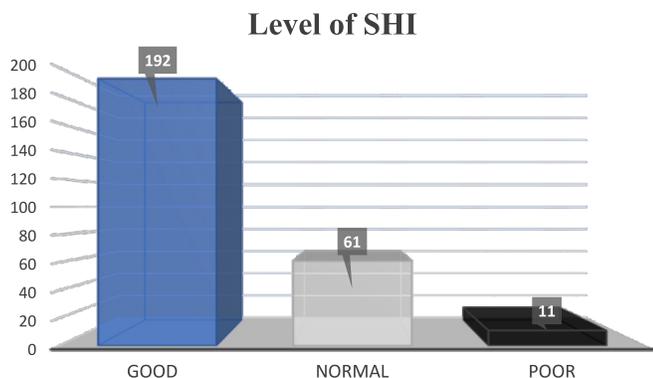


Figure 1: Displays the Level of Sleep Hygiene Index of the Participants

There were no statistically significant differences found when mean scores were compared across participant characteristics. The scores of students from public colleges (21.09 ± 7.25) and colleges that are private colleges (21.42 ± 9.07) were similar ($p=0.74$). Male had a slightly higher mean score than female, but gender differences were similarly not statistically significant ($p=0.07$). Students from single-parent households (19.88 ± 9.43), nuclear families (21.21 ± 7.35), and joint families (21.83 ± 8.55) demonstrated comparable results, and family type did not significantly affect the scores ($p=0.42$). Similarly, marital status did not correlate with significant differences ($p=0.14$) (Table 2).

Table 2: Comparison of Mean Scores Across Participant Characteristics

Characteristics	Mean \pm SD	p-value	Mean Diff (95% CI)	Cohen's d/ η^2
Sector				
Public	21.09 \pm 7.25	0.74 [†]	-0.33 (-2.32-1.66)	0.040
Private	21.42 \pm 9.07			
Age				
≤ 25 Years	21.42 \pm 8.15	0.27 [†]	2.03 (-1.63-5.71)	0.249
> 25 Years	19.38 \pm 8.76			
Gender				
Male	22.57 \pm 9.46	0.07 [†]	2.04 (-1.69-4.26)	0.251
Female	20.52 \pm 7.34			
Family Type				
Single Parent	19.88 \pm 9.43	0.42 [‡]	-	-
Nuclear Family	21.21 \pm 7.35			
Joint Family	21.83 \pm 8.55			
Marital Status				
Single	21.52 \pm 8.07	0.14 [†]	2.32 (-0.80-5.45)	0.283
Married	19.20 \pm 9.08			

[†] Independent t-test, [‡] One-way ANOVA

DISCUSSION

This study assessed factors affecting sleep among nursing students, in terms of demographic characteristics, 64% were female, 36% were male. Similar results were reported in a previous study, where 68% of participants were female

[13]. In this study, male had a slightly higher mean score (22.57 ± 9.46) than females (20.52 ± 7.34). Another study found that 73% of male students had poor sleep quality, suggesting that male and female students may experience different sleep disturbances [14]. The age distribution appeared to have an impact on sleep habits. 80% of undergraduate students on sleep hygiene and factors influencing sleep were between the ages of 18 and 24, which is similar to the findings of the present study, which is 92% [15]. On the other hand, another study found that participants over the age of 25 had poor sleep, suggesting that sleep disturbances may appear differently in different age groups [16]. Family type did not significantly affect the scores ($p=0.42$). A study found that the majority, 43.2% of participants, were from nuclear families and proposed that the family environment may influence stress levels and lifestyle choices, which may have an effect on sleep [17]. Conversely, a study found that students from joint families slept poorly and were more stressed than those from nuclear families [18]. In this study marital status did not correlate with significant differences ($p=0.14$), while the mean score of single participants was slightly higher (21.52 ± 8.07) than that of married participants (19.20 ± 9.08), similarly study agreeing with the current research, discovered that most students 88.5% were unmarried and that marital status had no obvious impact on sleep quality [19]. In contrast, another investigation found that 46.8% of single students had poor sleep quality compared to 21.4% of married students [20]. Although the current study's results differed from previous research, which discovered that nearly 55% of nursing students had moderate to poor sleep hygiene, in contrast to the bar chart's typically high-quality levels [21].

This study is limited by its cross-sectional design, which prevents causal interpretation of associations between demographic factors and sleep patterns. Data were collected from nursing colleges in a single city and relied on self-reported measures, which may be subject to recall and response bias. Future studies should employ longitudinal or multicenter designs to better capture changes in sleep behavior over time. Additionally, interventional research focusing on sleep hygiene education and stress management programs may help improve sleep quality among nursing students.

CONCLUSIONS

The findings of the study conclude that there is a difference in sleep patterns in terms of gender; male participants reported poorer sleep quality, and age has also affected sleep quality, and this poor sleep affects their academic performance and health quality.

Authors' Contribution

Conceptualization: SK

Methodology: SG, SJ, NG

Formal analysis: SK, RS, SG

Writing and Drafting: SK, RS, NY, KM, NG

Review and Editing: RS, NY, SK, SG, KM, SJ, NG

All authors approved the final manuscript and take responsibility for the integrity of the work.

Conflicts of Interest

All the authors declare no conflict of interest.

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