Factors associated with quality of sleep among undergraduate nursing students of Biratnagar nursing campus

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Abstract

Background

Sleep is an integral part of human biological rhythm and it is essential for optimal health as well as cognitive and psychosocial functioning. WHO has recognized sleep as a global health issue of the 21st Century. Sleep problems may lead to physical & mental health, educational and societal problems which is need to be a concern. This study aimed to assess the factors associated with quality of sleep and to identify the level of sleep quality among undergraduate nursing students of Biratnagar nursing campus.

Methods and Materials

A cross-sectional study was conducted among 314 nursing students studying at Biratnagar nursing campus. The purposive sampling technique was adopted to obtain the desired sample size. Data entry and analysis were done in SPSS version 16. Descriptive statistics like mean, proportion, standard deviation and inferential statistics like bivariate regression were used. All estimates were presented with a 95% Confidence Interval (CI). Findings were presented in table.

Results

The prevalence of poor sleep quality was nearly half (48.8%). Nearly half of the nursing students had poor sleep quality with a PSQI total average score found at a higher level >5. The mean total PSQI score of nursing students was 5.98±3.31. The study showed a significant association of sleep quality with educational status (p=0.030) and presence of mental illness (p=0.042).

Conclusion

These study findings concluded that nearly half of the nursing students had poor sleep quality. Thus sleep hygiene awareness and interventions are needed to initiate among young nursing students to achieve optimum level of health and good academic performance.

Keywords

sleep, sleep quality, nursing student

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INTRODUCTION

Sleep is a state of reduced mental and physical activity where there is an alteration of consciousness and all sensory activities are ceased. Sleep is an integral part of human biological rhythm, and it is essential for optimal health as well as cognitive and psychosocial functioning.

Poor sleep quality affects psychological health, such as learning, memory, and cognition in medical students.[1]

The diagnostic criteria for insomnia disorders in the DSM-5 and ICSD-3 (International Classification of Sleep Disorder-3) classified sleep disorders as:- difficulty initiating sleep, maintaining sleep, and waking up earlier than desired with an inability to return to sleep.[2]

Sleep quality is the overall aspect of sleep behavior, such as sleeping time, total sleep time, the number of wakes per night, the depth of sleep, and its relaxing. So when there is poor sleep quality, there is a deprivation of attention/memory, emotional variability, which may affect individual's overall quality of life.

Nursing students have to follow a unique concept of lifestyle. Therefore, students who cannot sleep adequately

may be physically, cognitively, and emotionally affected.[3] According to the report of WHO CDC data (2013-2020), the prevalence of short sleep duration varied by state, ranging from 29.3% to 42.8% in the United States whereas in the Netherlands it was 23.5%.

The US National Health Interview Survey showed that in 2020, 14.5% of adults had trouble falling asleep most days or every day in the past 30 days. A greater percentage of non-Hispanic White (21.0%) adults had trouble staying asleep most days or every day in the past 30 days compared with non-Hispanic Black (15.4%), Hispanic (10.6%), and non-Hispanic Asian (8.7%) adults.[4]

The American Academy of Sleep Medicine and the Sleep Research Society (SRS) have recommended that adults aged 18 to 60 years should sleep seven or more hours per night on a regular basis for ideal sleep health. The National Sleep Foundation (NSF) consensus report has stated that seven to nine hours is recommended for adults aged 18 to 64 years, while seven to eight hours is suggested for those 65 years of age and older.[5]

A study done among Medical students in Karachi, Pakistan, 2015 showed 39.5% students as poor sleepers having a global PSQI >5. [6]

There are number of studies regarding sleep quality done among medical students abroad however, still lack of study among nursing students in developing countries like Nepal. Thus, to address this gap and sensitize the respondents as well as concerned authorities, this study is going to conduct. Hence, this study aims to assess the quality of sleep among nursing students.

MATERIAL AND METHOD

A descriptive cross-sectional study design was used to assess the level of quality of sleep among nursing students of Biratnagar nursing campus. The campus is situated at Sub Metropolitan city of Biratnagar, Morang District. It is one of the oldest government nursing colleges under Tribhuwan University of Nepal established in 2023 BS. Currently, 314 students are studying BSN and BNS programs. Sample size was calculated using formula z^2pq/d^2 where p=39%, d (allowable error=5%).[17] [Surani AA, et al. 2015] Sample size was 354, including 10% non- response rate. However, the total number of samples selected was 314. Non-probability purposive sampling method was used

to obtain information using the standard tool PSQI by self-administered questionnaire in Nepali version. The English and Nepalese translation of the questionnaire along with its scoring procedure was provided by authorized source, MAPI Research Trust, France after completing certain agreement criteria online by the researchers.

The validity of the tool was obtained by translating the tool into Nepali language and back to English language with the help of language expert. Content validity was obtained by consulting with subject experts. Reliability of the tool was obtained (internal reliability of a = .83, a test–retest reliability of .85 for the global scale, with sensitivity of 89.6%, and a specificity of 86.5%) by Buysse DJ et al.(1989) (Matsangas & Mysliwiec, 2018). Since the tool is standard form and already validated by original authors, pre-testing was not done.

The questionnaire was divided into two parts. Part I: Socio-demographic information, Part II: PSQI tool. It consisted of total 7 components with 19 items. Cut off point was maintained; <5= good sleep quality and >5 = poor sleep quality. [28] [Buysse DJ, et al. 1989)]

Ethical clearance was obtained from the Nepal Health Research Council (NHRC), Kathmandu. Informed written consent was taken from each respondent. The obtained data were coded, entered, and analyzed in Statistical Package for the Social Sciences (SPSS) version 16. Descriptive statistics (frequency, mean, standard deviation) were used while inferential statistics, like bivariate regression, were used to assess the association with different variables.

RESULT

Table 1 showed maximum (63.7%) of the respondents were from the age group 21-30 years, followed by less than 20 years (33.1%). Mean age was 22.49 with a standard deviation of 3.682. Female respondents were more (96.5%) than males. Brahmin/Chhetri were 44.6% followed by Janajati (32.2%). About 87% were Hindu by religion.

Regarding education, 53.4% respondents were studying BSN while 43.6% were studying BNS. Regarding socioeconomic status, 93.9% were from middle socioeconomic status, and 66.6% were from urban area.

Table 2 depicts that 4.8% of the respondents had presence of mental illness. Similarly, 6.4% took alcohol, and 58.3%

consumed caffeinated beverages. One hundred percent of respondents used social media. Among the users, 92.7% used social media for four to six hours daily.

Table 3 showed maximum (56.7%) of the respondents used to sleep late at night between 11pm to 1am. More than 48% of the respondents fell asleep within 15 minutes in bed, followed by 77.1% respondents waking up before 7am in the morning. Only 65% of the respondents had actual sleep at night for duration of 5-7 hours. Mean actual total sleep time was 6.87 hours and mean sleep latency was 22.85 minutes.

Table 4 revealed that one third (31.2%) of the respondents couldn't fall asleep within 30 minutes after going to bed once or twice a week. Nearly one third (29.3%) of the respondents woke up in the middle of the night once or twice a week. Similarly, one third (32.5%) of the students got up to use the bathroom once or twice a week. However, 13% of the respondents could not breathe comfortably less than once a week. Less than one third (12.4%) of the students reported coughing or snoring loudly less than once a week. About one fourth (24.5%) of the respondents felt too cold while sleeping once or twice a week, while 17% of the students felt too hot while sleeping once or twice a week. Nearly one third (28%) of the respondents had bad dreams less than once a week during the past month. However, about 19% of the students had pains once or twice a week during the past one month. Regarding reasons for having trouble sleeping, about 11% reported having physical pain, 5.1% had environment and family problems followed by 3.2% with psychological problems in the past month.

More than half (58.6%) of the respondents took sleep medications less than once a week to induce sleep. Less than one fourth (4.5%) of respondents had trouble staying awake during activities less than once a week and 15% of the respondents had problems enthusiastically doing activities less than once a week. More than one-third (36.6%) of the students rated their quality of sleep as 'Fairly bad' overall in the past month.

Table 5 showed that nearly half of the respondents (48.8%) had poor sleep quality.

Table 6 revealed a significant association of sleep quality with educational status (BNS) which was (p=0.030).

Table 7 revealed significant association of sleep with presence of mental illness (p=0.042).

Table 1: Socio-demographic data (N=314)

Variables	Frequency (n)	Percentage (%)
Age (in years)		
Less than 20	104	33.1
21-30	200	63.7
More than 30	10	3.2
Mean±SD (22.49±3.682)		
Sex		
Female	303	96.5
Male	11	3.5
Ethnicity		
Brahmin/chhetri	140	44.6
Janajati	101	32.2
Terai/Madhesi	59	18.7
Others	14	4.5
Religion		
Hindu	276	87.9
Others	38	12.1
Education		
BNS	137	43.6
BSN	177	53.4
Grade		
BNS (n=137)		
1st	37	27.1
2nd	65	47.4
3rd	35	25.5
BSN (n=177)		
1st	50	28.2
2nd	78	44.1
3rd	35	19.8
4th	14	7.9
Economic Status		
Low	14	4.5
Middle	295	93.9
High	5	1.6
Residence		
Urban	209	66.6
Rural	105	33.4
Place of Current Accommodation		
Home	79	25.2
Rent	61	19.4
Hostel	174	55.4

Table. 2 Behavioral Variables (N=314)

Questionnaire	Yes (n)	Percentage (%)	No (n)	Percentage (%)
Presence of mental illness	15	4.8	299	95.2
Alcohol Consumption	20	6.4	294	93.6
Consumption of caffeinated beverages	183	58.3	131	41.7
Use of social media	314	100	-	-
If yes, Hours spent in screen time in a day				
≤3 hours	137	43.7	-	-
4-6 hours	154	92.7	-	-
>6 hours	23	7.3	-	-

Table. 3 PSQI Questionnaire Responses   **(N=314)**

Questionnaire	Frequency(n)	Percentage(%)
Time to go in bed		
7-10pm	136	43.3
11pm-1 am	178	56.7
Time taken to fall asleep		
≤15mins	153	48.7
16-45mins	131	41.7
>45mins	30	9.6
Wakeup time in the morning		
≤7am	242	77.1
>7am	72	22.9
Actual sleep at night		
2-4hrs	15	4.8
5-7hrs	204	65.0
8-10hrs	95	30.2

Table 4: Factors affecting sleeping quality as measured by PSQI (N=314)

Reasons for having trouble sleeping	Not during the past month n (%)	Less than once a week n (%)	Once or twice a week n (%)	3 or more times a week n (%)
Cannot get to sleep within 30mins	127 (40.4)	48 (15.3)	98 (31.2)	41(13.1)
Wake up in the middle of the night	116 (36.9)	62(19.7)	92(29.3)	44(14.1)
Have to get up to use the bathroom	103(32.8)	53(16.9)	102(32.5)	56(17.8)
Cannot breathe comfortably	231(73.6)	42(13.4)	29(9.2)	12(3.8)
Cough or snore loudly	214(68.2)	39(12.4)	31(9.8)	30(9.6)
Feel too cold	116(36.9)	50(16.0)	77(24.5)	71(22.6)
Feel too hot	202(64.3)	48(15.3)	55(17.5)	9(2.9)
Have bad dreams	114(36.3)	88(28.0)	86(27.4)	26(8.3)
Have pains	181(57.6)	43(13.7)	61(19.4)	29(9.2)
Other reasons	**253(80.6)**			
i. Physical related problems	-	-	35(11.1)	-
ii. Psychological related problems	-	-	-	10(3.2)
iii. Environmental and family related problems	-	16(5.1)	-	-
Taking sleep drugs to induce sleep	80(25.5)	184(58.6)	42(13.4)	8(2.5)
Have trouble in staying awake during activities	290(92.4)	14(4.5)	4(1.3)	6(1.9)
Had problems to enthusiastically doing activities	No problem at all 231(73.6)	Only a very slight problem 47(15.0)	Somewhat of a problem 28(8.9)	A very big problem 8(2.5)
Sleep quality rating overall in past month	Very good 121(38.5)	Fairly good 66(21.0)	Fairly bad 115(36.6)	Very bad 12(3.8)

Table. 5 Quality of sleep (N=314)

Sleep Quality	Frequency(n)	Percentage(%)
Good Sleep Quality	164	52.2
Poor Sleep Quality	150	48.8
Mean±SD	5.98±3.31	

Table 6. Association of sleep quality with Sociodemographic Variables (N=314)

Variables	Sleep Quality		OR	CI	p-value
	Good Sleep	Poor sleep			
Age(years)					
<25	141(53.6%)	122(46.4%)	1.407	0.77-2.57	0.265
>25	23(45.1%)	28(54.9%)			
Sex					
Male	4(36.4%)	7(63.6%)	0.511	0.14-1.78	0.284
Female	160(52.8%)	143(47.2%)			
Religion					
Hindu	144(52.2%)	132(47.8%)	0.982	0.49-1.93	0.958
Others	20(52.6%)	18(47.4%)			
Education					
BNS	62(45.3%)	75(54.7%)	0.608	0.38-0.95	0.030
BSN	102(57.6%)	75(47.8%)			
Place of Residence					
Urban	113(54.1%)	96(45.9%)	1.246	0.77-1.99	0.358
Rural	51(48.6%)	54(51.4%)			
Ethnicity					
Brahmin/Chhetri	70(50%)	70(50%)	0.750	0.24-2.27	0.611
Tarai/Madhesi	39(66.1%)	20(33.9%)	0.385	0.11-1.26	0.115
Janajati	49(48.5%)	52(51.5%)	0.796	0.25-2.45	0.692
Others	6(42.9%)	8(57.1%)	Reference		
Economical Status					
Low	8(57.1%)	6(42.9%)	1.212	0.00	0.999
Medium	151(51.2%)	144(48.8%)	1.541	0.00	0.999
High	5(100%)	-	Reference		
Current accommodation					
Home	40(50.6%)	39(49.4%)	Reference		
Rent	26(42.6%)	35(57.4%)	1.257	0.73-2.14	0.400
Hostel	98(56.3%)	76(43.7%)	1.736	0.96-3.12	0.067

Table 7. Association of sleep quality with Behavioral Variables (N=314)

Variables	Sleep Quality		OR	CI	p-value
	Good Sleep	Poor sleep			
Presence of mental illness					
Yes	4(26.7%)	11(73.3%)	0.316	0.98-1.01	0.042
No	160(53.5%)	139(46.5%)			
Alcohol Consumption					
Yes	9(45.0%)	11(55.0%)	0.734	0.29-1.82	0.504
No	155(52.7%)	139(47.3%)			
Consumption of caffeinated beverages					
Yes	92(50.3%)	91(49.7%)	0.828	0.52-1.29	0.412
No	72(55.0%)	59(45.0%)			
Use of social media (all Yes)					
≤3hrs	70(51.1%)	67(48.9%)	0.486	0.25-1.51	0.291
4-6hrs	85(55.2%)	69(44.8%)	0.650	0.21-1.27	0.155
>6hrs	9(39.1%)	14(60.9%)	Reference		

DISCUSSION

On the basis of available literature, the researchers have discussed the major findings of the present study and compared them with the findings of the other relevant studies. This is a descriptive cross-sectional study conducted at Biratnagar nursing campus, Biratnagar, with the objectives to identify the level of quality of sleep among nursing students and to determine the factors associated with quality of sleep among undergraduate nursing students.

In this study, the sleep quality of nursing students was examined and the association with different Socio-demographic and Behavioral variables were assessed.

Nearly half of the nursing students had poor sleep quality, with the PSQI total average score found to be high (>5). The mean total PSQI score of nursing students was 5.98±3.31, and the prevalence of poor sleep quality was 48.8%. These data suggest that sleep quality may be affected by age group, level of education, use of social media, economic status, lifestyles, family and social structures, and different behavioral factors. Thus, it is revealed that sleep problems are common health problems among nursing students.

In this study, the female respondents were more (96.5%) than the males, which is consistent with the findings of a study done in Turkey among nursing students in which

female respondents were higher (83%). In the current study, the mean age was 22.49 years which is similar to the study that showed the mean age of students was 21.54 years. Similarly, in the current study, the majority of the respondents (93.9%) were from middle economic status which is congruent with the findings of the study done in Turkey. Regarding accommodation, the current study showed 55.4% of the respondents stayed at a hostel, which is similar to the study in which 58.2% of the respondents lived in a hostel.[29]

Many studies have shown the presence of mental illness has negative effects on sleep. In this study, there was a presence of mental illness in 4.8% of nursing students that had affected sleep quality yet no similar studies regarding this were found.

In the present study, the consumption of alcohol was 6.4% among nursing students, which is supported by the findings of Turkey among nursing students that showed 6.4% of the respondents consumed alcohol. Likewise, in this study, regular intake of caffeinated beverages was reported by 58.3% of respondents which is consistent with the study that showed 71.5% of respondents consumed caffeinated beverages regularly.[27]

Consumption of alcohol and caffeinated beverages might affect sleep quality like longer waking hours, longer sleep latency with shorter sleep duration. Prolonged use of these substances may also affect mental health.

In this study, hours spent in screen time daily for 4-6 hours was found in 92.7% of the respondents; however, it contradicts among medical students in Jordan, which showed screen time of the same duration in minority (25%).[22] Longer screen time is reflected into poor academic performance and poor sleep quality.

Regarding bedtime, more than half of the nursing students (56.7%) in this study went to bed after midnight. This is in agreement with the study done in Pakistan among medical students that showed a relatively high proportion (72%) of them went to bed after midnight.[17]

Regarding the sleep latency domain, this study showed more than one third (41.7%) of the students had longer sleep latency which took them 16-45 minutes to fall asleep. This finding supports the study done among Brazilian nursing students that showed 36.4% needed 16-30 minutes

to fall asleep.[30] This might be the reason for the lack in total sleep duration resulting in poor sleep quality among nursing students. This study findings showed mean sleep latency was 22.85 minutes which supports the study done in Pakistan among medical students, which showed mean sleep latency was 21 minutes.[17]

In the current study, the majority (77%) of the students woke up before 7 am in the morning which is similar to the study that showed 56.2% of students woke up before 7 am. Regarding total sleep hours, the current study showed 65% of the students usually slept 5-7 hours per night. The finding matches the study that showed sleep duration was less than 7 hours. Also, this study revealed mean total sleep time was 6.87 hours, which agrees with the study that showed mean total sleep time was 6.4 hours.[17]

After analyzing all these sleep quality components, these responses supported worse sleep quality among nursing students. Prolonged sleep latency, longer waking time, shorter sleep duration and earlier waking habit experiences directly result in poor sleep quality. Thus, disruption of sleep-wake behavior described by our study could be attributed to poor academic competence, less memory power, exam stress, and negative cognitive performance, which eventually might affect both physical and mental health in nursing students.

Regarding determinants of sleep quality, the current study showed that about one third (31.2%) of students had longer sleep latency, which took over 30 minutes to fall asleep once or twice a week. However, this finding contradicts to the study that showed only 11.9% students took over 30 minutes to fall asleep. Similarly, the current study showed that 29.3% of students woke up in the middle of the night once or twice a week, which contradicts to the findings that showed only 9.8% of students woke up in the middle of the night.

About one fourth (24.5%) of the respondents felt too cold once or twice a week. This finding is supported by study that showed 20% felt too cold. Similarly, 17% of respondents in this study felt too hot once or twice a week. Likewise, it was found that 21% of the respondents felt too hot while sleeping.[16] Thus, all these factors contribute to poor sleep quality.

Poor sleep may be associated with somatic pain like muscle cramps, gastritis, migraine headache, low back pain, neck

Rai B. et al. Factors associated with quality of sleep among

41

pain, eye pain, and vision problems etc as well as a tendency to a high pain threshold. These were the major physical problems among nursing students found in our study whereas, psychological problems like stress, anxiety, homesickness, fear of examination, overthinking, and family problems were the common reasons that might have affected sleep quality in nursing students. Thus, these determinants reflect into poor sleep quality that might result in poor academic achievement as well as poor health. The current study surprisingly revealed that more than half (58.6%) of the respondents used sleeping medications less than once a week to induce sleep. However, this finding contradicts the study done among university medical students in Jordan that showed only 2.9% students used sleeping medications less than once a week.[16] Easy availability of sleeping medicine in an abundance of pharmacies near the college and hostel might be the reason for this. To deal with harsh study and frequent academic assessment, as well as to overcome hectic clinical duty with clinical assignments might be the reasons that a huge number of nursing students took sleeping medicine to induce proper amount of sleep.

Regarding the subjective experience of overall sleep quality in this study, students scored as 'fairly bad' (36.6%) which is congruent to the study done in Northern Malaysian college students that showed 33.3% students scored their sleep quality as fairly bad or very bad.[16]

The current study showed the mean of the PSQI score was 5.98±3.31. This result is similar to the study done among medical students in Jordan that showed a mean of 6.76±3.32.[22] In this study, the PSQI score showed poor sleep quality among nursing students (48.8%), which supports the findings of medical students of Karachi, Pakistan, in which PSQI was 39.5% and were classified as poor sleepers.[17]

Concerning the subjective experience of overall sleep quality, there were some findings in our study that students experienced problems in doing activities enthusiastically, had trouble staying awake during activities, taking sleep medications to induce proper sleep, prolonged sleep latency, and shorter sleep duration, waking at the middle of the night, etc. These attributes might have contributed to score their sleep quality to be 'Fairly bad'. This result also showed congruence with their scoring of sleep quality as 'Poor'.
In current study, showed a significant association of sleep quality with education (BNS). (p=0.030) Though the number

of BNS was less than BSN, comparatively the BNS students were more mature and older, some had been married with children and were adjusting with more family and social life responsibilities than the generic BSN students. So these factors might have affected their sleep quality. However, there were not found any significant association of sleep quality with other domains of Socio-demographic variables. This study showed although huge number of students stayed at the hostel, more students who were living in rented accommodation had poor sleep quality. The reason might be that because of freedom, sedentary life at rent, less disturbance with no parental control obviously promote them to use more screen hours and delay sleep.

Limitations and Bias

This study is conducted in only one government nursing college in eastern Nepal. Thus the result may not generalize the quality of sleep among nursing students of whole nation. The study is limited only one government nursing college and not included other private nursing colleges of Nepal.

Recommendations

There should be sleep awareness in nursing students to achieve higher academic performance and achievement in their study. Strategies should be developed in all institutional level for good sleep quality among young nursing students that impacts on their physical, psychological, and spiritual health and well being. Importance of good sleep quality is essential to add in academic curriculum of nursing.

CONCLUSION

These study findings conclude that nearly half of the nursing students had poor sleep quality. There is a significant association of quality of sleep with different variables as education and the presence of mental illness. Significant association of quality of sleep was found among BNS students rather than BSN students. It may be because of increased level of maturity, more family responsibility and age-related physical illness among them. Mental illness of any kind directly affects sleeping pattern than those who do not have. Thus, in this study finding it showed significant association of quality of sleep with mental illness in few number of students. However, this study still showed gaps in some specific aspects of sleep quality like, the effect of sleep quality on academic performance, and the relation of sleep quality with academic achievement which could be conducted in future research.

CONFLICT OF INTEREST

None

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