Sleep Quality and Stress among Nursing Students during COVID-19 Pandemic

*Sharada Sharma[1], Punam Gurung[1], Ganga Panta[2]

[1]Pokhara Nursing Campus, Institute of Medicine, Tribhuvan University

[2]Maharajgunj Nursing Campus, Institute of Medicine, Tribhuvan University

ABSTRACT

Introduction: Long-term stress has a significant impact on people's ability to fall asleep. The study was conducted with the aim to assess the sleep quality and stress during COVID-19 Pandemic.

Methods: A cross-sectional descriptive study was done among nursing students. One nursing campus was selected from the total of six bachelor level nursing campuses in the Pokhara from simple random lottery method. All the bachelor level students of that campus were included in the study. Data were collected through self-administered questionnaire using Pittsburgh sleep quality index and perceived stress scale. The collected data was analyzed using Statistical Package for Social Science 16. Chi square test was used to identify the association between level of sleep quality and COVID related variables. Pearson's correlation was used to examine the relationship between stress score with sleep quality. P value <0.05 was considered as statistically significant in all inferential statistical procedures.

Results: The mean age was 24.208±3.028, 31.4 percent of students lived with their family and 81 percent of them had clinical posting during COVID-19. The 61.9 percent of students had good sleep quality whereas 38.1 percent had poor sleep quality. Likewise, majority (91.4 %) of students had moderate stress. A significant association was observed between sleep quality and students infected with COVID-19. Pearson's correlation showed the students' stress had significantly positive correlation with sleep quality (P=0.030).

Conclusions: The study concluded that prevalence of poor sleep quality was found in more than one third of the nursing students. The majority of students experienced moderate level of stress during COVID-19 Pandemic.

Keywords: COVID-19, nursing students, sleep quality, stress.

***Correspondance:** Sharada Sharma, Associate Professor, Pokhara Nursing Campus, Institute of Medicine, Tribhuvan University, Email: sharada825@gmail.com, Mobile: 9841800903

INTRODUCTION

People around the world have been under a lot of stress because of the COVID-19 pandemic, and this stress has had a substantial impact on people's ability to sleep [1]. Due to the COVID-19, medical students' daily routines, learning styles, and methods of carrying out their daily activities have changed, potentially having a negative impact on their sleep patterns and routines [2]. Poor sleep is common among nursing students; it can lead to decreased performance, behavioral changes, nutritional changes, and even aggressive behavior owing to changes in sleep patterns [3].

Due to the fact that their academic programs require both theoretical knowledge and clinical responsibilities, medical students are particularly exposed to viral exposures, which could have an impact on their daily lives. Greek medical students saw an increase in sleep and mental health issues following COVID-19, including poor sleep quality, insomnia, exhaustion, etc. So, better monitoring of students' well-being is required, and subsequent counseling is currently more crucial [4]. Researchers also have identified that

students experiencing stress are more likely to develop depression, health problems, sleep disorders, and a decline in their academic performance [5]. Stress makes it harder to fall asleep, which prevents the person from getting enough rest for their mind [6].Several studies are done on sleep quality change during COVID-19 on general population but limited study was done on nursing students. So, this research aims to find out the stress and sleep quality changes due to COVID-19 pandemic and to examine the relationship between stress score and sleep quality among nursing students.

METHODS

A descriptive cross sectional research design was used. One public nursing campus was selected from the total six bachelor level nursing campuses in the Pokhara from simple random lottery method. Complete enumeration of Bachelor level nursing students from the selected campus who were studied during the COVID -19 situations was included for the study. The total numbers of students were 105 that are: Bachelor of Science in Nursing (BSN)-33 students and Bachelor of Nursing Science (BNS)-72 students.

Structured self-administered questionnaire was used to collect data. The questionnaire is divided into three sections. Section I consists demographic characteristics, COVID 19 related information and technology related information.

Section II consists of Pittsburgh sleep quality index (PSQI) which is validated tool developed by University of Pittsburg School of Medicine, Department of Psychiatry, 2001. It is self-report questionnaire that assess sleep quality which consist of 19 items, creating seven components and one composite score that produce one global score. These component scores consist of subjective sleep quality, sleep latency, and sleep duration, habitual sleep efficiency, sleep disturbance, use of sleep medication and day time dysfunction. The item is given score on a 0-3 interval scale where the global PSQI score is calculated by totaling the seven component scores which overall score range from 0 to 21.The score further classified as score < 5 = normal sleep quality and score 5 = poor sleep quality. The PSQI is a valid tool adopted by different researcher. Pretesting was done among 11 students. The tool was also used in Neplease context[8]. The reliability was established with Cronbach alpha which is 0.837.

Section III consists of, Perceived Stress Scale which is a standard and validated tool developed by Sheldon Cohen, 1994. It is a self-report questionnaire with 10 items that measures stress experience across the past 30 days on a 5-point scale (0 – never, 1= almost never,2 =sometimes, 3= often, 4= very often). It has 4 positive statements (4,5,7,8). Score for perceived stress was obtained by reversing the score of positive statements and summing all statements score. The score ranges from 0 to 40 with lower score indicate lower stress. The score further divided into low stress: 0- 13, moderate stress: 14-26 and high stress: 27-40.The Perceived Stress scale reliability has already been established with Cronbach alpha which was found 0.88 [7].This tool was freely available in public domain.

The data was collected after ethical approval. Informed written consent was taken from each individual student before collecting data with the explanation of objectives of the study. Confidentiality was assured prior to the data collection and used only for the study purposes. Anonymity was maintained by coding the questionnaire instead of name. General instruction was given to them on how to fill the questionnaires. Students were allowed to withdraw if they wish to. It took 15-20 minutes time for each student to complete the questionnaires.

The questionnaire was checked for completeness and accuracy. The collected data

was reviewed, organized and entered into the statistical package for Social Science (SPSS) version 16. In descriptive statistics: frequency, percentage, means and standard deviation was used to summarize the data. Chi square test was used to identify the association between level of sleep quality and COVID related variables and Pearson's correlation was used to examine the relationship of stress score with sleep quality. *P* value <0.05 was regarded as statistically significant in all inferential statistical procedures.

RESULTS

The study's findings were organized according to socio-demographic and COVID related characteristics, information about electronic devices, sleep pattern, sleep quality and level of stress.

Table 1 Socio-demographic and COVID-19 Related Characteristics of Nursing Students (n=105)

Characteristics	Number	Percent
Age in years		
20-25	67	63.8
>25	38	36.2
Mean± SD (24.208±3.028)		
Education Stream		
BNS	72	68.6
BSN	33	31.4
Marital Status		
Married	28	26.7
Unmarried	77	73.3
Residing in		
Hostel	48	45.7
Rent	3	2.9
With family	54	51.4
Infected by COVID-19		
Self	19	18.1
Family member	31	29.5
Clinical posting during COVID		
Yes	85	81.0
No	20	10.0

Table 1 illustrates that 63.8 percent of nursing students were between age group of 20-25 years, mean age± SD 24.208±3.028. Regarding the education, 68.6 percent enrolled in BNS. Nearly three-fourth of them (73.3%) was married whereas 31.4 percent of them lived with their family. Likewise, 81 percent of students had clinical posting during COVID-19 situation.

Table 2 Sleep Pattern among Nursing Students (n=105)

Variables	Number	Percent
Bedtime		
18-21pm	29	27.6
>21pm	76	72.4
Mean ±SD 21.43±1.88		
Time to fall asleep		
0-≤15 minutes	30	28.6
>15-≤30minutes	59	56.2
>30-≤60 minutes	16	15.2
Getting up time		
4-7am	93	88.6
>7am	12	11.4
Mean ± SD 6.54±0.899		
Actual sleep hour per night		
≥7 hours	79	52.2
<7 to ≥6hours	24	22.9
<6 to ≥5hours	2	1.9

Table 2 shows that 72.4 percent of the students usually go to the bed after 9 pm, 56.2 percent fall asleep within the duration of 16 to 30 minutes. Majority (88.6%) got up in the morning at 4 to 7 am. Regarding actual sleep, 52.2 percent students sleep ≥ 7 hours per night.

Table 3 Sleep Quality among Nursing Students (n=105)

Variables	Number	Percent
Level of sleep quality		
Good Sleep Quality (≤5)	65	61.9
Poor Sleep Quality (> 5)	40	38.1
Mean ± SD 5.01±2.24		
Self-rated Sleep quality		
Very Good	48	45.7
Fairly Good	44	41.9
Fairly bad	8	7.6
Very bad	5	4.8

Table 3 illustrates that 61.9 percent students had good level of sleep quality whereas 38.1 percent had poor sleep quality with mean ± SD (5.01± 2.24). Likewise, 45.7 percent of nursing students self rated sleep quality was very good.

Table 4 Level of Perceived Stress among Nursing Students (n=105)

Stress Level	Number	Percent
Low Stress (0-13)	5	4.8
Moderate Stress (14-26)	96	91.4
High Stress (27-40)	4	3.8
Mean ± SD 19.40 ± 3.77		

Table 4 shows that 91.4 percent students had moderate stress whereas 3.8 percent had high level of stress (Mean±SD19.40±3.77).

Table 5 Association between Level of Sleep Quality and COVID related Variables (n =105)

Variables	Level of Sleep Quality		x^2	p-value
	Goodn (%)	Poor n(%)		
Infected with COVID-19 virus				
Yes	7(36.8)	12(63.2)	6.179	0.013
No	58(67.4)	28(32.6)		
Family member infected with COVID				
Yes	18(58.1)	13(41.9)	0.275	0.6
No	47(63.5)	27(36.5)		
Clinical posting during pandemic				
Yes	52(61.2)	33(38.8)	0.100	0.481
No	13(65)	7(35)		

*p-value significant (<0.05) Fisher's *exact F*

In Table 5, there is significant association between sleep quality and students infected with COVID-19.

Table 6 Relationship between level of Stress with Sleep Quality (n =105)

Variables	Mean	Standard deviation	Pearson's correlation coefficient (r)	P-value
Stress score	19.40	3.77	0.212*	0.030
Sleep Quality	5.01	2.24		

*Correlation is significant at the 0.05 level (2-tailed).

Pearson's correlation analysis showed that students' stress had significant positive correlation with sleep quality (P-value=0.030). Results of correlation analysis are presented in Table 8

DISCUSSION

The present study was conducted to assess

the sleep quality and stress during COVID-19 pandemic among Nursing Students. The majority of students 63.89 % belong to age group 20-25 years with mean age 24.5±2.98.

The study revealed 61.9 % of nursing students experienced good sleep quality and 38.1 % experience poor sleep quality. Similar findings were observed in the study conducted in Kathmandu among medical students which revealed 30.36 percent nursing students had poor sleep quality [8] and about 80% were identified as generally poor sleepers by the PSQI[18].In contrary to the present findings, study conducted in Bali among nursing students during COVID-19 pandemic found that 97.1 percent of students have poor sleep quality [9].With their direct exposure to patients with COVID-19, medical students' levels of anxiety and stress are likely much greater, in turn leading to unhealthy sleep habits. This difference might be due to the COVID situation in different country context and exposure in the critical area. A survey of health care personnel in China concluded that more than one-third of the participants were experiencing insomnia and changes to their sleep habits because of the psychological and physical changes to their schedule and work expectations during the pandemic [10]. The effect of COVID -19 on sleep quality differs critically across individuals, and depends on the pre-pandemic sleep quality. Interestingly, a quarter of people with pre-pandemic insomnia experienced a meaningful improvement in sleep quality, whereas 20% of pre-pandemic good sleepers experienced worse sleep during the lockdown measures. Additionally, changes in sleep quality throughout the pandemic were associated with negative affect and worry [1].

The present study revealed that none of the nursing students were taken sleep medicine once or twice a week. This finding is supported by the study conducted among undergraduate students of the medical college Kathmandu [8]. But the study conducted on Saudi where 10.2 % of physician took medicine to fall asleep once or twice a week [11]. Likewise, significant association was seen between sleep quality and nursing student infected with COVID-19 (p= 0.03) in this study. The finding is different with the study conducted among health care workers at Kuwait showed there is no significant association between sleep quality and healthcare workers infected with COVID-19[12]. Furthermore, this study shows no association between sleep quality and family member infected with COVID-19 where the finding is different with the study conducted in undergraduate students enrolled in South Valley University Egypt which found that there is significant association between sleep quality and family member infected with COVID-19 virus[13].

In addition, more than half (56.2%) of the students fall asleep within the duration of 16 to 30 minutes and 52.2% sleep more than 7 hours. This shows that 38.1 percent had poor sleep quality during the Covid-19 pandemic in the current study. Likewise, 42.1% of students needed more than 30 minutes to fall asleep, 81.0 % of pharmacy students were classified in the poor sleepers based on the PSQI scoring results and most had poor sleep quality [14]. Although students spent more time in bed during lockdown, observed a reduction in sleep quality, in terms of both global PSQI score and in five of its components, during the COVID-19 lockdown. The sleep parameters related to the use of medication and daytime dysfunction saw no changes[3].

This study shows the moderate level of stress among 91.4% students during COVID-19 pandemic with mean ±SD (19.40±3.77). The mean score is similar with the study which showed the 22.16 ±1.41 [15]. The finding is higher than the study conducted in Saudi Arabia [16] and India [17], and lower than the study done in medical and nursing students in Nepal [18]. Likewise, only 3.8% students had high level of perceived stress in this study. Similar finding

was seen in the cross-sectional study in India [19] and the findings is higher among the college students in Egypt which shows 24.5% had high-perceived stress levels [13].

In addition, in this study Pearson's correlation showed that students' stress had significant positive correlation with sleep quality (*P*-value=0.030). In general, the COVID-19 pandemic has brought changes that affected sleep.

CONCLUSIONS

Prevalence of poor sleep-quality found in less than half of the nursing students. Majority of nursing students experienced moderate level of stress during COVID-19 Pandemic. There was significant association between sleep quality and student infected with COVID-19 virus. Stress had significant positive correlation with sleep quality of the students. Thus, it is important to address the stress level among nursing students by the campus and need to provide educational interventions by encouraging relaxation techniques that focus on stress management in order to improve the quality of sleep.

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