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Assessment of Sleep Quality and Sleep Hygiene among Nursing officers during COVID pandemic in a Tertiary Care Hospital in a Southern District of Karnataka, India

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Abstract

Introduction: Nursing officers are one of the susceptible groups prone to have sleep disturbances, which may not only influence their own health but also affect the nursing quality and treatment process. During COVID Pandemic, because of high work demand, nurses were made to run more shifts than regular days which can be quite stressful for them. Our study was conducted to assess the sleep quality and sleep hygiene among Nursing officers during COVID pandemic andto determine the factors influencing the Sleep quality and Sleep Hygiene

Methods: A cross sectional study was conducted from September 2021- October 2021 among nursing officers of Kodagu district hospital attached to Kodagu Institute of Medical sciences. Pittsburgh Sleep Quality Index questionnaire was used to assess the sleep quality, Epworth Sleepiness Scale was used to determine the presence of tendency of daytime sleepiness and Sleep hygiene index was used to assess the sleep hygiene among the respondents.

Results: Poor sleep quality was high(70.4%) among nursing officers. A significant association ($p<0.05$) of poor sleep quality was found with 31-40 years age group, nuclear family, less than 10 years of work experience and >15 nights shifts per month when logistic regression was applied. Poor sleep quality was high among the nursing officers who were practicing poor sleep hygiene (79.16 %).The assessment of daytime sleepiness showed that majority of the nursing officers (94%) were unlikely to be abnormally sleepy.

Conclusion: The prevalence of poor sleep quality was high among nurses which was done during COVID pandemic. Poor sleep quality was associated age, type of family, years of work experience and nights shifts. Recruitment of adequate number of nursing staff and scrupulously planned night shifts are needed to improve the sleep health and well being of nurses which sequentially will result in better and efficient patient care.

Keywords: COVID, Epworth Sleepiness Scale, Nurse, Pittsburgh Sleep Quality, Sleep hygiene index, Sleep quality Index

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Introduction

Sleep is a very powerful but also undervalued health wonder of all the health-related activities. Adequate sleep is not a luxury but it is biological necessity; it is also nourishing, refreshing and healing which is very obligatory for normal functioning of humans. Sleep is a defined as temporary state of unconsciousness from which the subject can be aroused with appropriate sensory stimuli.[1]

Sleep has been proven to be the single most important element in predicting longevity of human life and which is more significant than diet, exercise or heredity. Adequate and good quality sleep is critical for good cognitive, psychological and physical health of human being.[2]

Nursing officers are one of the most vulnerable groups prone to have sleep disturbances, due to both social & biological factors. Nurses' sleep disorders may not only influence their own health but also affect the nursing quality and the patients' health and treatment process. A lower work performance and higher risk of medical error associated with poor sleep quality is a concern for patients' safety.[3] According to a cross□sectional survey of nurses, the prevalence of insomnia was three to four times higher in nurses than that in the general population.[4]

Sleep hygiene has been defined as those behaviors that are believed to promote improved quantity and quality of sleep. [5] The exposure to shift works, and especially to night shift, goes against the circadian rhythmicity of the social man, which brings about a congregation of disruptive outcomes on one's health. [6] Previous surveys concluded that working shifts was associated with high levels of sleep problems and sleepiness.[7,8]

In addition to shift work, the nursing profession involves high work demand in pandemics like COVID 19 which can be quite stressful. Health facilities in most developing countries are highly understaffed; therefore, nurses may be made to run more shifts than necessary especially during pandemics like COVID. All these put nurses at extreme risk of poor sleep. Sleep disorders have also been associated with diseases such as hypertension, obesity, diabetes, cardiovascular diseases, and malignancies, such as breast and colorectal cancers.[9-11] The problem of sleepiness has not been recognized and addressed by most of the programs related to nursing profession, as the culture of patient care in the hospital often equates the number of hours on the job and without sleep, with professionalism and dedication to patient care.

Since the nursing officers play a major role in the patient care in the hospitals along with the doctors, they need enough sleep to work constantly. Literature shows only few studies have empirically assessed the sleep quality and sleep hygiene among nursing officers and none of the studies have been conducted during COVID pandemic. Thus the present study was conducted with the objectives:

- To assess the sleep quality and sleep hygiene among nursing officers during COVID pandemic.
- The determine factors influencing the Sleep quality and Sleep Hygiene.

Methods

A Cross sectional study was conducted from September 2021- October 2021among the nursing officers who were working in the district hospital of Kodagu which is attached to Kodagu Institute of Medical sciences. The hospital is staffed with 142 nursing officers who were working for COVID. All the nursing officers who were consented to participate in the study were included in the study by using purposive sampling method. Pittsburgh Sleep Quality Index (PSQI) questionnaire was used to assess the sleep quality among the nursing officers. A PSQI total score >5 was considered diagnostic of poor sleep quality, [12] and the Epworth Sleepiness Scale (ESS) [13] was used to determine the presence of tendency of daytime sleepiness among the respondents; the results were construed as follows: 0–7 was considered normal, 8–9 was considered average tendency of daytime sleepiness, 10–15 meant the presence of excessive daytime sleepiness, while 16–24 represented daytime sleepiness requiring medical intervention.

Sleep Hygiene Index (SHI) was used to assess the sleep hygiene which is a validated instrument that has been established to evaluate sleep hygiene conduct. It

included 13 self-reported questions. Nursing officers were requested to show how regularly they engage in certain performances (always, frequently, sometimes, rarely, never). The total SHI score is the summation of the 13-item marks. The total score scale lies between 0 and 52. Greater scores are suggestive of poorer sleep hygiene. [14]

Ethical consideration and Data collection: Ethical approval was obtained from the Institutional Research Ethical Committee (protocol number: KoIMS/IEC/28/2021-22). Informed consent was obtained from the study participants after a careful explanation of the research. Data was collected using standard questionnaire. The questionnaires were mailed /sent individually at their respective workplaces and asked them to fill and submit on the same day itself.

Statistical analysis: Data was entered into Statistical Package for the Social Sciences –Version 25 (IBM Inc. Armonk, New York, United States of America). The staffs' cadre, years of working experience, hours of work shift, hours of sleep and other socio-demographic profile were summarized using frequency tables and mean. The Chi-square and Logistic regression analysis were deployed to compare categorical variables with PSQI score. $p< 0.05$ was considered as statistically significant.

Results

Out of the total 142 nursing officers, 7 declined to participate. Hence, a total of 135 nursing officers responded with filled Google form, giving an effective response rate of 95%.

Table 1. Characteristics of the participants

Sl.No.	Sample characteristics		Frequency(percentage)
	Age	21-30	32(23.7%)
		31-40	61(45.2%)
		41-50	25(18.5%)
		>51	17(12.6%)
2.	Gender	Female	121(89.6%)
		Male	14(10.4%)
3.	Marital status	Married	122(90.4%)
		Unmarried	13(9.6%)
4.	Family type	Nuclear family	122(90.4%)
		Joint family	13(9.6%)
5.	Qualification	Masters of science in Nursing	9(6.7%)
		Bachelor of science in Nursing	76(56.3%)
		General nursing and Midwifery	50(37.0%)
6.	No. of years of work experience	6-10 years	79(58.5%)
		11-15 years	13(9.6%)
		16-20 years	20(14.8%)
		>21 years	23(17.0%)
7.	Night shift	Yes	126(93.3%)
		No	9(6.7%)
8.	Work injury	Yes	27(20.0%)
		No	108(80.0%)
9.	Department	Emergency and casualty	40(29.6%)
		Intensive care unit	32(23.7%)
		Wards	63(46.7%)

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Sl.No.	Sample characteristics		Frequency(percentage)
10.	Any present medical conditions	Yes	51(37.8%)
		No	84(62.2%)
11.	Epworth score	Unlikely	127(94.0%)
		Average	4(3.0%)
		Excessively sleepy	4(3.0%)
		Need medical help	0(0%)
12.	Pittsburg score	<5	40(29.6%)
		>5	95(70.4%)

Table 1 summarizes the characteristics of the participants. Most of the study participants belong to age group 31-40 years. Majority of the nursing officers were female 121(89.6%), married 122(90.4%) and belong to nuclear family 122 (90.4%).126(93.3%) of the nursing officers had night shift. Epworth score was used to assess the daytime sleepiness which showed that majority of the nursing officers (94%) was unlikely to be abnormally sleepy and none of the nursing officers were excessively sleepy or needs medical attention. The prevalence of poor sleep quality according to Pittsburgh Sleep Quality Index (PSQI) was 95(70.4%).

Table 2. Association of participants' characteristics with sleep quality.

Characteristic	Sleep quality according to PQSI†		Chi square value	P value
	Good (PQSI†<5)	Poor (PQSI†>5)		
Age in years				
21-30	10(31.3%)	22(68.8%)	15.939	0.001*
31-40	9(14.8%)	52(85.2%)		
41-50	14(56.0%)	11(44.0%)		
>51	7(41.2%)	10(58.8%)		
Marital status				
Married	35(28.7%)	87(71.3%)	0.538	0.463
Unmarried	5(38.5%)	8(61.5%)		
Type of family				
Joint	10(76.9%)	3(23.1%)	15.431	0.001*
Nuclear	30(24.6%)	92(75.4%)		
Qualification				
Masters of science Nursing	5(55.6%)	4(44.4%)	6.909	0.032*
Bachelor of science Nursing	26(34.2%)	50 (65.8%)		
General nursing and Midwifery	9(18.0%)	41(82.0%)		
Years of work experience				
6-10 years	14(17.7%)	65(82.3%)	17.598	0.001*
11-15 years	3(23.1%)	10(76.9%)		
16-20 years	10(50%)	10(50%)		
>21 years	13(56.5%)	10(43.5%)		

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Characteristic	Sleep quality according to PQSI†		Chi square value	P value
	Good (PQSI†<5)	Poor (PQSI†>5)		
Night shift				
Yes	34(27.0%)	92(73.0%)	6.344	0.012*
No	6(66.7%)	3(33.3%)		
Number of night shift per month				
No night shift	6(66.7%)	3(33.3%)	16.729	0.002*
3-6 per month	8(57.1%)	6(42.9%)		
7-10 per month	6(24.0%)	19(76.0%)		
11-14 per month	15(31.3%)	33(68.8%)		
>15 per month	5(12.8%)	34(87.2%)		
Department				
Emergency and casualty	6(15.0%)	34(85.0%)	8.679	0.013*
Intensive care unit	51(46.9%)	17(53.1%)		
Wards	19(30.2%)	44(69.8%)		
Any present Medical condition				
Yes	13(25.5%)	38(74.5%)	8.023	0.005*
No	27(32.0%)	57(67.9%)		

*p< 0.05, †Pittsburgh Sleep Quality Index

Table 3. Logistic regression analysis of factor influencing poor sleep quality.

Characteristic	Adjusted OR	95% Confidence interval	p value
Age			
21-30 years	0.018	0.000- 0.936	0.001*
31-40 years			
41-50 years			
>51 years			
Type of family			
Joint family	0.033	0.004-0.250	0.001*
Nuclear family			
Years of work experience			
6-10 years	0.033	0.004- 0.287	0.005*
11-15 years			
16-20 years			
>21 years			
Night shift			
Yes	0.002	0.000-0.071	0.001*
No			

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Characteristic	Adjusted OR	95% Confidence interval	p value
No. of night shifts per months			
No night shift	0.029	0.0042-0.225	0.001*
3-6 per month			
7-10 per month			
11-14 per month			
>15 per month			
No night shift			
Department			
Emergency and casualty	0.310	0.031-3.063	0.316
Intensive care unit			
Wards			

*p< 0.05

Sleep quality was found to be significantly associated with age of the nursing officers, type of family, qualification, years of work experience, nights shifts, number of night shifts per month, department under which they work and presence of any medical condition [Table 2]. But when these significant factors were adjusted in the logistic regression analysis, a significant association of poor sleep quality was found with age, type of family, years of work experience and nights shifts [Table 3].

Table 4. Association of Sleep Hygiene Index with sleep quality.

Sleep Hygiene Index	PQSI* Score <5 (Poor sleep quality)	PQSI* Score <5 (Good sleep quality)	Total
Good sleep hygiene (0-13)	5(10.0%)	45(90.0%)	50(100%)
Fairly good sleep hygiene (14-26)	6(13.04%)	40(86.96%)	46(100%)
Fairly poor sleep hygiene (27-39)	10(66.6%)	5(33.3%)	15(100%)
Poor sleep hygiene (40-52)	19(79.16%)	5(20.84%)	24(100%)
Total	40(23.0%)	95(77.0%)	135(100%)
Chi Square value: 53.427 p value: <0.0001			

*Pittsburgh Sleep Quality Index

Table 4 shows that there is significant association between the sleep hygiene index and sleep quality among the nursing officers. Poor sleep quality was high among the nursing officers who were practicing poor sleep hygiene (79.16%) and good sleep quality was high among those who were practicing good sleep hygiene (90.0%).

Discussion

The prevalence of poor sleep quality as defined by PSQI score >5 was 70.4%, which is very high compared to the results (46.31%) of the study done among the nurses of various parts of South India [2] and also in a study done among the nurses in a tertiary care hospital in Manipur which is 43.0%. [5] This may be because our study was done during COVID pandemic during which nursing officers were made to run more shifts than normal or regular days. As many of the nursing officers were tested positive for COVID 19, the remaining staff had worked more hours to cover the duties of them. But surprisingly quite similar higher results (65%) was reported the among nursing professionals in South eastern Brazil.[15] In the present study sleep quality was significantly associated with age, and it was highest among the nursing officers with age group 31- 40 years (85.2%) which was similar to the study done among the nurses in Malaysian government

hospital which showed highest among age group 30-39 years (63.3%).[16] Married nursing officers had poor sleep quality (60.1%) compared to the single nursing officers in a study done in Malaysia[16] which was similar to our study (71.3%).

In a study done among the nurses of north west Nigeria[17] and among the south Indian nurses,[2] the results showed that the nursing officers with higher experience has good sleep quality than the nurses with lower experience which was similar to the results in our study. Our study showed significant association between the night shifts and number of night shifts per month with the sleep quality which showed that the nursing officers who had more than 15 night shifts had poor sleep quality than the nursing officers who had less than 3 night shifts per month which was similar to the results of the studies done in Nigeria and Manipur.[17,5] The shift duties for nursing officers was more during the period of the study because of the COVID 19 pandemic and few nursing staff were infected with COVID so the remaining ones should run more shifts than normal. There was significant association between the qualification of the nursing officers and sleep quality. General nursing and Midwifery nurses have poor sleep quality which is in contrast with the study done among nurses in Manipur.[5]

There was no significant association between the marital status of the nursing officers and the sleep quality in the present study when logistic regression applied which is similar with the study done among nursing staff of a tertiary care centre in Taiwan and Manipur.[18,5] Our study showed that the nursing officers from nuclear family had poor sleep quality than those from the Joint family, this may be because in joint family the responsibilities of the family are widely distributed among all the family members and thus the household stress will be less in joint family than nuclear family.[19]

Present study showed that there was significant association between the department in which the nursing officers work and the sleep quality but when logistic regression was applied it showed no significant association between the department and poor sleep quality. Even the literature showed the association is inconsistent in studies done among nurses in china showed that working in the intensive care unit and emergency department had a higher risk for sleep disturbance[20] in opposite to the studies done in Taiwanese[21] nurses and Hong Kong[22] nurses which showed no difference in the sleep quality of nurses in different departments.

In our study there was significant association between the sleep hygiene index and sleep quality among the nursing officers. Poor sleep quality was high among the nursing officers who were practicing poor sleep hygiene and good sleep quality was seen high among who were practicing good sleep hygiene practices which was similar to the results found in a study done among Primary healthcare centre nursing staff in Southwest Saudi Arabia.[23] This shows that sleep hygiene practice play an important role in maintaining sleep quality.

Conclusion

The prevalence of poor sleep quality was high among nurses, with seven out of every ten nurses having poor sleep quality. A significant association of poor sleep quality was found with 31-40 years age group, nuclear family, less than 10 years of work experience and>15 nights shifts per month. Nursing officers who were practicing poor sleep hygiene had poor sleep quality.

Limitation: As the study done during COVID pandemic, no wonder the prevalence of poor sleep quality is very high among nursing officers but, when compared to other studies done before pandemic the results of our study are unpredictably high so comparative studies should be done to compare the prevalence rate after the pandemic and also further longitudinal studies with larger population, need to be conducted to identify the factors causing poor sleep quality.

Recommendations: The high prevalence rate poor sleep among nursing officers is a matter of concern to the administration to prepare the nursing manpower for the pandemic by recruiting needed number of nursing staff, with proper and adequate training to them, following protocol for the provision of duty offs after night shift duties and avoidance of extended shift duties, so as to promote effective sleep quality among the nurses.

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