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A Comparative Study to Assess the Quality of Sleep among Shift and Non-Shift Working Staff Nurses in Selected Hospital of Lucknow, Uttar Pradesh

Priya Bajpai

Abstract: ***Sleep plays a vital role in maintaining physical, mental, and emotional well-being, yet its quality is often compromised among healthcare professionals, particularly nurses, due to the demands of shift work. This study, titled "A Comparative Study to Assess the Quality of Sleep among Shift and Non-Shift Working Staff Nurses in Selected Hospital of Lucknow, Uttar Pradesh", aimed to evaluate and compare the sleep quality of nurses working in rotating shifts with those working in fixed general duty. Using a quantitative, non-experimental, exploratory, cross-sectional design, data were collected from 100 nurses (50 shift nurses and 50 non-shift nurses) at Dr. Ram Manohar Lohia Hospital, Lucknow. The Pittsburgh Sleep Quality Index (PSQI) was employed as the standardized tool to measure subjective sleep quality, sleep latency, duration, efficiency, disturbances, use of sleep medication, and daytime dysfunction. Results revealed that 68% of non-shift nurses reported good sleep compared to 58% of shift nurses, though the difference was not statistically significant (p = 0.30). No significant association was found between demographic variables and sleep quality among non-shift nurses. The findings suggest that while shift nurses displayed slightly poorer sleep quality, overall sleep patterns among both groups were comparable. The study highlights the need for administrative interventions such as sleep hygiene education, workplace wellness programs, rest provisions during night duty, and periodic health assessments to mitigate fatigue and sleep disturbances. Replication of the study with larger samples and interventional research, such as yoga-based approaches to reduce fatigue and improve sleep, is recommended to enhance the well-being and efficiency of nursing professionals.***

Keywords: Sleep quality, Shift work, Non-shift nurses, Pittsburgh Sleep Quality Index (PSQI), Sleep disturbances, Nursing professionals, Circadian rhythm, Fatigue, Health outcomes, Patient safety.

1. Introduction

"Each night, when I go to sleep, I die and the next morning, when I wake up, I am reborn". It is a great saying by Bapu, the renowned Indian leader. It clearly means that sleep makes everything new and fresh. It is a natural process which helps an individual to relax and refreshes their body and mind, offering a kind of break to move ahead with the daily chores energetically and comfortably. Scientifically, sleep is 'a period of rest accompanied with varying degree of unconsciousness and relative inactivity'.

Hypothalamus is responsible for controlling Sleep Physiology which also helps to maintain daily cycles such as sleep-wake cycle, body temperature regulation, hormone secretion, digestion, performance capabilities and mood. Circadian and Ultradian rhythm are the two biological rhythms which are involved in sleep. The circadian rhythm plays an important role and program the individual on a 24-hour schedule to sleep at night and to be awake during the day.

Sleep requirement varies from person to person. Short sleepers are people who require fewer than six hours of sleep each night for functioning adequately whereas long sleepers are those who needs more than nine hours each night to function adequately. The requirement of sleep also varies according to the progressive age, as a newborn may sleep for 20 hours and average adult needs 6-7 hours of sleep. Although, women at mid age sleep more comparative to males. In more recent report of National Sleep Foundation in America (2005) it was found that as compared to males, women have more difficulty in falling and staying asleep. They also experience more daytime sleepiness. According to a study done on the healthy population of Bangalore, India, it was found that average duration of actual-sleep was seven hours ranging from 3.5 to 9.1 hours.

The sleep pattern also shows individual difference. It depends on the individual that in which manner his routine for work and rest has been accustomed. The circadian cycle can be influenced by certain internal and external factors. Internal factors such as hypersensitivity to noise, predisposition to worry, medical or psychiatric illnesses, medications and consumption of alcohol.[9] External factors includes, coming of new born in the family, heavy work load from school and offices and shift work. This leads to improper sleep during night and requirement of naps during the daytime. It is found that nap taken by normal night sleepers in morning or noon includes more of REM sleep, whereas nap taken in afternoon or early evening involves less REM sleep.[11] According to American data, since 1910, the average normal sleep duration has decreased from about 9 hours to approximately 7.5 hours in present time. In a study on Indian Population by Sinha. K it was revealed that 6.5% women and 4.3% men had disturbed sleep.

1.1 Need for the Study

The nurses, being the part of health team provide services round the clock. Therefore, one of the biggest challenges for nurses who work the night shift is getting enough sleep. In a study it was found that on average, nurses in night shift sleeps three hours less than those who did not work during nights. It can also be noted that nurses working in shifts longer than ten hours are more prone to experience burn out. Over time also continues to be a strong factor in extended shifts. Most previous studies on sleep quality of nurses focused on the effect of shift work on subjective sleep perception using self-report questionnaire and revealed that shift nurses have poorer sleep quality as compared to general

duty nurses. According to International Classification of Sleep Disorders, 5-8% of population exposed to night works on a regular or irregular basis suffers from Shift Workers Sleep Disorder.

Sleep disorders tend to occur among nurses typically working in shifts. Although many studies related to nurses' sleep quality have been carried out in the West, few have investigated factors linked to nurses' sleep quality in Hong Kong. American nurses gets on an average of 6.8 hours of sleep on their work days instead of the commonly recommended eight hours per 24-hour period. This continuous sleep deprivation of even an hour a day can lead to a sleep debt over time that is not easily erased. Poor sleep quality among hospital staff nurses not only leads to health problems in nurses, but also leads to decreased vigilance, a lower work performance, occupational injury and a higher risk of medical errors which may somehow affect patient's safety.

1.2 Research Statement

A Comparative Study to Assess the Quality of Sleep among Shift and non-shift Working Staff Nurses in Selected Hospital of Lucknow, Uttar Pradesh.

1.3 Purpose of the study

The purpose of the study was to assess the quality of sleep of nurses who were working in shift duty [Morning (8am-2pm), Evening (2pm-8pm) and Night shift (8pm-8am)] and Non shift duty (8am-4pm).The study aimed to compare the quality of sleep of shift duty nurses and non-shift duty nurses to observe the effect of duties on their quality of sleep.

1.4 Objectives of the study

- To compare the quality of sleep of shift working staff nurses and non-shift working staff nurses.
- To determine association between quality of sleep of shift working and non-shift working staff nurses with their selected demographic variables.

1.5 Operational Definitions

- **Quality of sleep**- In the present study quality of sleep refers to subjective response regarding subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication and day time dysfunction, as measured by Pittsburgh Sleep Quality Index.
- **Shift working staff nurses-** In the present study, the term refers to staff nurses working in morning, evening and night shift duties.
- **Non- Shift working staff nurses-** In the present study, the term refers to staff nurses working in general duty.
- **Sleep latency**- In the present study it refers to length of time taken from lying down on bed at night until sleep onset.
- **Sleep duration**-In the present study it refers to average hours of sleep per day.
- **Habitual sleep efficiency**-In the present study it refers to the proportion of time spent asleep over the total time spent in bed.
- **Sleep disturbances-**In the present study it refers to factors which are responsible for the alterations in sleep.
- **Day time dysfunction-**In the present study it refers to problems in attending day time chores because of sleep.
- **Global Score**-Global score is the sum of all the components of PSQI.

2. Review of Literature

An extensive review of literature relevant to the topic was done to gain the insight and collect maximum information for building the foundation of the study. The researcher made use of various journals texts, Medline searches and internet to avail the information pertaining to related study. The review of literature is organized and presented under the following headings:

Hiva Azmoon, Habibollah Dehghan, Jafar Akbari, and Shiva Souri (2012) conducted a cross-sectional study to determine the relationship between thermal comfort and light intensity with the sleep quality and eye fatigue in shift nurses. This study included 82 shift nurses from 18 nursing workstations in Isfahan Al-Zahra Hospital, Iran. Heat stress monitoring (WBGT) and photometer (Hagner Model) were used for measuring the thermal conditions and illumination intensity, respectively. To measure the sleep quality, visual tiredness and thermal comfort, Pittsburgh sleep quality index, Eye fatigue questionnaire and Thermal comfort questionnaire were used, respectively. Results revealed that thermal comfort and sleep quality had a positive and direct relationship but the correlation between thermal comfort and WBGT index had a weak relationship.[43]

Min-Huey Chung, Wen-I Liu, Hui-Ling Lee and Nanly Hsu (2013) conducted a cross-sectional study to examine the effect of neuro-physiological, psychological and behavioral factors on sleep quality. A structure equation model was used to investigate behavioral and psychological factors that influence neuro-physiological regulation of sleep in shift workers. 338 female shift nurses were included in the study from an urban regional hospital. The Morningness-Eveningness Questionnaire and short-form Menstrual Distress Questionnaire were used to measure neuro-physiological factors involved in morningness- eveningness and menstrual distress. The Sleep Hygiene Awareness and Practice Scale (SHAPS) and Profile of Mood States Short Form (POMS-SF) were used to measure behavioral factors of sleep hygiene practices and psychological factors of mood states. Pittsburgh Sleep Quality Index (PSQI) was used to measure self-reported sleep quality. The results revealed that sleep hygiene practices and mood states mediated the effects of morningness-eveningness and menstrual distress on sleep quality.[44]

Abdelbaset M. Saleh,Nabil J. Awadalla,Yosr M. El-masri,Wafaa F. Sleem (2014) conducted a descriptive cross sectional study to explore the prevalence of sleep disorders, fatigue and depression in nurses and their impact on medication administration errors, at Oncology Center of Mansoura University. Convenient sampling was used to

select 52 full-time staff nurses. Data was collected using demographic data, a depression scale (CES-D), modified fatigue severity scale, a medication errors observation sheet and an AASM (American Academy of Sleep Medicine) two week sleep diary. The results reflected that the medication administration errors, fatigue and depression were all significantly affected by circadian sleep disorders.[45]

Fernando M. Green and Alvaro D. Taveira conducted a cross-sectional study to assess sleep related problems among nurses and nurses' aides on the night shift at University Hospital of the West Indies, Jamaica. 176 nurses were selected for the study out of which 102 responded to demographic information. Safety for staff and patients was assessed with questions of driving and committing medication errors. The affective aspects were assessed with questions on irritability towards others. Data was gathered during seven consecutive nights. The results revealed decrease in the number of hours of sleep was associated with increased difficulty staying awake on the job, irritability, tiredness and medical errors.[46]

b. Sleep disturbances among health care professionals and others working in shifts

Elisabeth Flo, Staole Pallesen, Nils Mageroy, Bente Elisabeth Moen, Janne Gronli, Inger Hilde Nordhus et al. (2012) conducted a study on Shift Work Disorder in Nurses – for assessing their Prevalence and Related Health Problems**.** 5400 Norwegian nurses were involved in the study. The data collection involved the demographic details, Bergen Insomnia Scale, Epworth Sleepiness Scale, Global Sleep Assessment Questionnaire, Diurnal Scale, Revised Circadian Type Inventory, Dispositional Resilience (Hardiness) Scale-Revised, Fatigue Questionnaire, Hospital Anxiety and Depression Scale. Results showed that Prevalence rates of symptoms of shift work disorder varied from 32.4–37.6% depending on the assessment method and from 4.8–44.3% depending on the work schedule. Associations was found between symptoms of shift work disorder and age, gender, circadian type, night work, number of shifts separated by less than 11 hours and number of nights worked the last year, insomnia and anxiety. The prevalence of symptoms indicative of shift work disorder was high.[49]

M. K. Vijayalaxmi, Anu George and Natasha Nambiar (2013) conducted a prospective study on General Health Pattern among Night Shift Work Employees in a Tertiary Care Hospital at Father Muller Medical College and Hospital, Manglore, India. The study enrolled 100 Permanent day employees and shift employees from different occupational ranks like doctors, house-surgeons, nurses, administrative employees, lab technicians, ward maids etc. The subjects were divided into two groups of 50 members each, shift employees (study group) and non-shift employees (control group). The data was collected using a health- based questionnaire divided into six parts which included working conditions, physical attributes, lifestyle, food habits, psychological health, and other health problems. The results revealed that Shift workers had low general health score (35.1) compared to day workers (39.5). Lifestyle factors like inadequate sleep, irregular eating habits, skipping of meals and lack of exercise had significant association with shift work and were found to contribute to ill health. [50]

Hemamalini RV, Krishnamurthy N, Prabhavathi K, Saravanan. A (2014) conducted a cross-sectional study to analyze the impact of shift work on their psychological health and memory performance at Pondicherry Institute of Medical Sciences. 40 security guards who were in rotating night shifts from past one year and 40 day workers who were not in night shift from past two years were involved in the study. Psychological health status was assessed using Depression Anxiety Stress Scales and memory performances were assessed by digit symbol substitution test, letter cancellation test and word recall and object recall. The results revealed severity of depression, anxiety and stress among night shift workers and day workers. Significant difference was found for all the memory tests performed between night shift and day workers. A weak correlation between the memory performance and the psychological health status of the night shift workers was found.[51]

3. Research Methodology

This chapter deals with the description of the research methodology. It also includes various logical steps that were generally adopted by the investigator for studying the research problem which included research setting, population, sample, sampling techniques, the description of tools and the ethical permissions from concerned authorities.

Research Approach
The research approach adopted in the study was Quantitative approach.

Research Design
The investigator used 'Non experimental, exploratory, cross sectional study design' in present study.

Research setting
The present study was conducted at RML Hospital, Lucknow, Uttar pradesh.

Population
The population under this study constituted of staff nurses working in Hospitals of Lucknow, Uttar pradesh.

Sample
The samples in the present study were staff nurses working in shift and general duties in selected Hospital of Lucknow, Uttar pradesh.

Sample size and Sampling technique
In the present study 100 (shift nurses-50 and non-shift nurses-50) were selected through the Simple random sampling technique.

Description of the tools
The purpose of the study was to compare the quality of sleep of shift and non-shift working nurses. A standard tool was

used to collect data from the participants as it provided adequate information about their Quality of Sleep.

The following tools were used to generate the necessary data:

- Tool 1-Baseline data
- Tool 2- Pittsburgh Sleep Quality Index

Scoring of PSQI

The instrument consists of 19 self-rated questions and 5 rated by the room-partner or the bed partner (if one is available). Only self-rated questions are included in the scoring. Items 1-4 are free entry responses concerning usual bed time and getting up times, minutes of total sleep time and sleep latency (minutes) and items 5-18 are 4-point Likert scale. The 19 self-rated questions are combined to form 7 component scores and each of which has a range of 0-3 points. In all cases zero indicates no difficulty and 3 indicates severe difficulty. The seven components are:

- Subjective sleep quality (1 item)
- Sleep latency (2 items)
- Sleep duration (1 item)
- Habitual sleep efficiency (3 items)
- Sleep disturbances (9 items)
- Use of sleep medicine (1 item)
- Daytime dysfunction (2 items)

The seven components score are then added to yield one global score, with the range of 0-21 points, where 0 indicates no difficulty and 21 indicate severe difficulty in all the areas. The cut off value for the global score is 5. According to it, as the global score increases the quality of sleep decreases. Less than and equal to 5 global score value is considered as good sleep and more than 5 global score value is considered as bad sleep quality.

Permission to use PSQI

Permission and approval to use PSQI was obtained by E-mail from Professor Buysse and licensed agreement was signed with the MAPI Research Trust.

4. Analysis and Interpretation

Table 1: Comparison between Quality of sleep among shift and non- shift staff nurses, (N=100)

Global score	Shift nurses (n=50)		Non shift nurses (n=50)		X2	P value
	(f)	(%)	(f)	(%)		
Good sleep (<5)	29	58	34	68	1.07	0.3
Poor sleep (≥5)	21	42	16	32		

Global score is the sum of all the components of PSQI
df =1
T-tab = 3.84

Table 1 shows comparison between global score of shift and non-shift working staff nurses. Data reveals that 34 (68%) of non- shift nurses experienced good sleep which was more as compared to shift nurses 29 (58%). But, there was no statistically significant difference between sleep quality of shift nurses and non- shift nurses.

Table 2: Association between quality of sleep of non-shift nurses with their demographic variables, (N=50)

S. No	Variable	Good sleep (≤5)	Poor sleep (>5)	df	X2	P value
1	**Age #**					
	23-32yrs	14	10	2	1.106	0.57
	33-42yrs	17	6			
	43-52yrs	3	0			
2	**Gender ***					
	Male	14	6	1	0.06	0.8
	Female	20	10			
3	**Marital status***					
	Married	24	8	1	2	0.15
	Unmarried	10	8			
4	**Number of children #**					
	No children	11	10	2	3.07	0.21
	One child	5	0			
	Two children	18	6			
5	**Age of youngest child#**					
	0-8years	14	6	2	1.3	0.5
	8-16years	7	0			
	Above 16 years	2	0			
6	**Age of eldest child#**					
	1-7years	3	3	3	1.24	0.74
	7-14 years	12	3			
	14-21 years	1	0			
	21-28 years	2	0			
7	**Family type#**					
	Nuclear	23	12	1	0.03	0.8
	Joint	11	4			
8	**Area of work#**					
	General ward	11	4	2	2.3	0.3
	General duty	17	12			
	Critical ward	6	0			
9	**Years of experience#**					
	1-9yrs	14	9	2	0.9	0.6

	10-18yrs	16	7			
	19-27yrs	4	0			
10	**Regularity of menstrual cycle#**					
	Regular	17	8	1	0	1
	Irregular	3	2			
11	**Use of drinks before sleep#**					
	Tea	1	1	2	0.2	0.8
	Milk	17	6			
	None	16	9			
12	**Use of items before sleep#**					
	TV	17	2	4	5.7	0.21
	Mobile phone	9	6			
	Laptop	0	2			
	Relaxation therapy	5	5			
	None	3	1			
13	**Environment during sleep#**					
	Silent	28	14	2	0.3	0.8
	Dark	4	1			
	Noisy	2	1			

*signifies Chi square test is used.
signifies Chi square with Yates correction is used
Significance at 0.05 level.($p<0.05$)

Global score is the sum of all the components of PSQI
Table 2 shows association between qualities of sleep of non-shift nurses with their selected demographic variables. It was revealed that there was no statistically significant association between the selected demographic variables and the quality of sleep of non-shift working nurses.

5. Conclusion

In today's cut throat competitive life, people work excessively to become updated and up to the mark. The health department specially, the nurses also deliver the best care 24X7, which somehow affects their sleep patterns. The study concluded that the nurses working in shifts and those working in general duty had slight difference in their sleep quality but statistically no significant difference was proved. Therefore according to the present study the sleep quality of shift and non-shift nurses was found to be almost similar.

6. Nursing Implications

The present study emphasized to compare the Quality of sleep of shift and non-shift nurses. The findings of the study have implications for Nursing Practice, Nursing Education, Nursing Administration and Nursing Research.

1) Nursing Practice
Several implications can be drawn from the present study for Nursing Practice. Nursing personnel plays an important role in disease prevention and promotion of health. The education programmes with effective teaching strategies can be incorporated. The education programmes may emphasize on the importance of adequate sleep and the results of improper sleep patterns and sleep habits. Health information can be imparted through different methods like lectures, pamphlets, discussions etc.

2) Nursing Education
Since today's nursing students are the future nursing professionals, nurse educators, administrators and the supervisors. This study also has the implications in nursing education. The importance of health education and the method of imparting education in an effective way during the students training period play an important role.

3) Nursing Administration
Nurse administrator should take interest in providing information about health care of the nursing professionals working in the institute. Nurse as an administrator should plan and organize certain programmes, workshops, exercises and yoga practices to improve the sleep pattern. The concept of rest room for nurses to take small naps during the night shift can also be incorporated. Provision for regular checkups to assess sleep problems in nurses can be made.

4) Nursing Research
Research provides nurses the credibility to influence decision making, policy and protocol formulation regarding the interventional strategies to meet the specific need to improve the sleep quality of staff nurses working in the institute. The findings of the present study suggest that nurses should be aware about their sleep quality and sleep problems.

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