



PREVALENCE OF GASTROESOPHAGEAL REFLUX SYMPTOMS AMONG STAFF NURSES INVOLVED IN NIGHT SHIFTS IN A TERTIARY CARE HOSPITAL IN PUDUCHERRY - A CROSS SECTIONAL STUDY

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ABSTRACT

Background Sleep deprivation may induce gastrointestinal disturbances and gastrointestinal symptoms may also lead to sleep derangements. Staff nurses in night shifts have high stress and burnouts. **Objectives** 1. To assess the prevalence of gastrointestinal Reflux symptoms among staff nurses involved in night shifts in a tertiary care centre in Puducherry. 2. To find association between reflux symptoms and sleep quality among the staff nurses in night shift. **Material and Methods** The present study was cross sectional study carried out among staff nurses doing night shifts in a tertiary care centre in Puducherry for a period of 3 months. Participants with preexisting acid peptic disease, GI motility disorders, recent gastrointestinal surgeries, usage of analgesics at least once a month, pre-existing sleep disorders, pregnancy were excluded. The data was collected in a semi structured questionnaire. Statistical analysis was done using descriptive and analytical statistics. **Results** Around 60% of the participants were found to have poor sleep quality. Around 14% had 89% chance of having GERD and 25% had 79% chance of GERD based on their symptoms. The regard to the association between GERD and sleep quality, those with poor sleep quality were found to have increased chance of experiencing GERD symptoms and the probability of GERD was also higher in them than those with good quality sleep according to PSQI. **Conclusion** Both Gastroesophageal reflex disease and Sleep quality were found to be positively associated with each other.

KEYWORDS : Sleep deprivation, sleep quality, reflux disease, night shift, stress, Gastrointestinal disease, gastrointestinal symptoms.

INTRODUCTION

Gastroesophageal Reflux Disease (GERD) is characterised by reflux of gastric contents into oesophagus resulting into heartburn and acid regurgitation⁴. It is a common gastrointestinal disease encountered in GI practice⁵. It was reported that 13% of the world's population experience GERD symptoms at least once per month⁶. GERD also exerts a larger burden on the health care system⁷.

GERD and sleep demonstrate a bidirectional relationship. GERD can lead to sleep deficiency and sleep deficiency will in turn lead to GERD⁸. GERD will result in sleep fragmentation as the reflux symptoms causes conscious awakening and there can also be multiple amnesic arousals⁹. Sleep deficiency leads to increase in oesophageal hypersensitivity and oesophageal acid exposure both acutely and chronically in GERD patients¹⁰.

The present study was carried out with the objective of assessing the prevalence of gastrointestinal Reflux symptoms among staff nurses involved in night shifts in a tertiary care centre in Puducherry and to find association between reflux symptoms and sleep quality among the staff nurses in night shift. Studies with similar objective was not conducted in the study setting before. The study will throw insights about the sleep disturbance and GERD symptoms among the study population.

MATERIAL AND METHODS

The present study was a cross sectional study carried out in Sri Venkateshwarra Medical College Hospital and Research centre, Puducherry for a period of 3 months between September 2023 to November 2023. All the staff nurses who were in night shifts during the study period were the participants for the study. Ethical clearance for the study was obtained from institutional ethics committee. Informed consent was obtained from all the participants included into the study.

Staff nurses with preexisting acid peptic disease, any GI motility disorders, recent gastrointestinal surgeries, usage of analgesics at least once a month, pre-existing sleep disorders like insomnia, psychiatric conditions and pregnancy were excluded from the study. Total number of staff nurses that were included into the study was 160. A pretested, semi-structured

and validated questionnaire was used to collect the data.

The questionnaire consisted of 3 parts. The I part dealt with Sociodemographic profile, Part II dealt with sleep quality assessment using Pittsburgh Sleep Quality Index (PSQI) scale¹¹ and the last part, part III consists of Gastroesophageal Reflux symptoms assessment using GERD-Q score¹². The sociodemographic data included age, sex, education, height, weight and BMI. The PQSI consisted of 10 questions out of which 9 questions account for scoring and they address a total of 7 components. All the aspects were assessed for the past one month. Total score of all the 7 components is added together to arrive at the final score. The GERD questionnaire explored the symptoms of GERD in the past 7 days. It totally consisted of 6 questions. The first 5 questions explored the symptoms of GERD like heart burn, regurgitation, pain, nausea and sleep. The 6th question was about the medication taken for the relief of the symptoms. Based on the answer to each question and adding them up, final score for each participant was obtained.

The data collected were then entered into Microsoft excel 2019 and the master chart was created which was then loaded onto SPSS version 26 for statistical analysis. Both descriptive and analytical statistics were used in the analysis.

RESULTS

Among the participants included into the study, 125 (78.1%) were in the age group 23 to 27 years and 35 (21.9%) were in the age group 28 to 35 years. 135 (84.4%) were females. 124(77.5%) were from urban area. 17 (10.6%) were obese. 146 (91.2%) were working for 84 hours in night shift per month and 14 (8.8%) were working for 90 hours per month (Table 1). 13 (8.1%) were diabetic. 15 (9.3%) were hypertensive. 6 (3.7%) were smokers and 4(2.5%) consumed alcohol. 89 (55.6%) had one coffee or tea per night and 28 (17.5%) had two or more coffee or tea per night. 67(41.9%) reported to have taken snacks at midnight per week once and 29 (18.1%) reported it to be twice and 13 (8.1%) had snacks at midnight more than twice per week (Table 2).

78 (48.8%) reported to have fairly good subjective sleep quality followed by 35 (21.9%) reported to have fairly bad sleep quality. 26(16.3%) reported their sleep quality to be very bad. 70 (43.8%) reported a sleep latency of 31 to 60 minutes

followed by 42 (26.3%) reported a sleep latency of 16 to 30 minutes. 84 (52.5%) reported a sleep duration of 6 to 7 hours followed by 34 (21.3%) reported a sleep duration of 5 to 6 hours. 94 (58.8%) reported habitual sleep efficacy as 75 to 84% and 42 (26.3%) reported habitual sleep efficacy to be more than 85%. 110 (68.8%) got a score of 1 to 9 for the causes of sleep disturbances. No participant had taken sleep medication in the past one month. 94 (58.8%) reported daytime dysfunction as nil and 35 (21.9%) reported daytime dysfunction as 1 to 2 (Table 3). According to PSQI, 95 (59.3%) were found to have poor sleep quality (Fig 1).

59 (36.9%) reported no burning feeling behind the breast bone in the last one week. 45 (28.1%) reported to have burning feeling once in the last week and in 31 (19.4%) it was 2 to 3 times. For the question 'How often did you have stomach contents moving upwards to your throat or mouth', 87(54.4%) reported nil, 54 (33.8%) reported once in last 7 days, 29 (18.1%) had it 2 or 3 times in last week. 29 (18.1%) reported once in a week they had pin in the middle of the upper stomach and 17 (10.6%) reported the pin in the middle two or three times in a week. 54(33.8%) had nausea, once in a week and 18 (11.3%) had nausea twice or thrice in a week. 39 (24.4%) had reported that they had difficulty having good night's sleep due to heartburn or regurgitation and 21(13.1%) reported to have similar disturbance for twice or thrice in a week. 58 (36.3%) reported to have taken additional medication for heartburn or regurgitation and 21 (13.1%) had taken the medication twice or thrice in last week (Table 4). 68 (42.5%) had 50% chance of having GERD, 41 (25.6%) had 79% chance of having GERD and 23 (14.4%) had 89% chance of having GERD (Fig 2).

Among the participants categorised to have poor quality of sleep according to PSQI scale, 31 (32.6%) had 50% chance of having GERD, 36 (37.9%) had 79% chance of having GERD and 21 (22.1%) had 89% chance of having GERD. Among those with good quality of sleep, 37 (56.9%) had 50% chance of GERD. 5 (7.7%) had 79% and 2 (3.1%) had 89% chance of having GERD. The proportion of participants with higher chance of GERD was higher in those with poor quality of sleep than those with good quality of sleep with P value of less than 0.05 (Table 5).

DISCUSSION

GERD and sleep have a bidirectional relationship between them. GERD might result in sleep deficiency and sleep deficiency if present can increase the probability of getting GERD⁸. Those with GERD will have disturbed sleep and the sleep deficiency in turn increases the oesophageal hypersensitivity and oesophageal acid exposure in both acute or chronic GERD patients^{9,10}. The present study was done with the objective of assessing the prevalence of gastrointestinal reflux symptoms among staff nurses involved in night shifts in a tertiary care centre in Puducherry and to find out the association between reflux symptoms and sleep quality among the staff nurses in night shift.

The study was cross sectional study carried out in a tertiary care hospital for a period of 3 months. Ethical clearance for the study was obtained from institutional ethics committee. Informed consent was obtained from all the participants included into the study. Staff nurses with preexisting acid peptic disease, any GI motility disorders, recent gastrointestinal surgeries, usage of analgesics at least once a month, pre-existing sleep disorders like insomnia, psychiatric conditions and pregnancy were excluded from the study.

Around 60% of the participants were found to have poor sleep quality. Around 14% had 89% chance of having GERD and 25% had 79% chance of GERD based on their symptoms. The regard to the association between GERD and sleep quality, those with poor sleep quality were found to have increased chance of experiencing GERD symptoms and the probability

of GERD was also higher in them than those with good quality sleep according to PSQI. Francy A et al in their study reported 15% nurses to have shift work disorder which is marked by chronic and severe sleep-wake disturbances due to inability to sufficiently adjust to shift work¹³.

Similar to the present study, Fujiwara Y et al reported that persons with GERD slept for lesser time than those without GERD¹⁴. Sukanuma et al reported a positive association between GERD and insomnia¹⁵. Farup et al documented that among those who had reported suffering from GERD symptoms a considerable proportion had the symptom at night. The symptoms occurred when they lay down at night. Sometimes they were awakened by the symptoms at night¹⁶.

A cohort study had reported that in general population the proportion to suffer from heartburn twice or more in a month to be almost 25%¹⁷. Junk HK et al reported that among those who were experiencing GERD symptoms, 50% was also found to have sleep disturbances¹⁸. A study had reported that self-reported poor sleep correlated with high number of supine reflex events and longer duration of reflux events¹⁹. Poh CH et al also reported that GERD was associated with disturbance in sleep²⁰. Teimouri A and Amra B reported a positive association between poor sleep quality and gastro-oesophageal reflux among medical students²¹. Similar results was also obtained by Kurin M et al²².

The present study was one of very few studies that tried to find the association between sleep quality and GERD symptoms in the present study setting. The study may not be generalisable as it was done in a single centre. The present study establishes a significant association between sleep quality and the presence of GERD.

CONCLUSION

Both Gastroesophageal reflux disease and Sleep quality were found to be positively associated with each other. Hence persons with both GERD and sleep disturbance both have to be addressed with appropriate treatment as one could lead to the other.

Table 1: Sociodemographic Characteristics Among The Study Participants.

Variables		Frequency (n=160)	Percentages (%)
Age group (in years)	23-27	125	78.1
	28-35	35	21.9
Sex	Male	25	15.6
	Female	135	84.4
Residence	Urban	36	22.5
	Rural	124	77.5
Obese	Yes	17	10.6
	No	143	89.3
Hours of night shift per month	90 hours	14	8.8
	84 hours	146	91.2

Table 2 : Distribution According To Comorbidities And Behavioural Characteristics

Variables		Frequency (n=160)	Percentage (%)
Diabetes mellitus	Present	13	8.1
	Absent	147	91.9
Hypertension	Present	15	9.3
	Absent	145	90.6
Smoking	Present	6	3.7
	Absent	154	96.3
Alcohol consumption	Present	4	2.5
	Absent	156	97.5
Coffee or tea per night	Nil	43	26.9
	1	89	55.6
	≥2	28	17.5

Intake of snacks at midnight per week	Nil	51	31.9
	Once	67	41.9
	Twice	29	18.1
	More than twice	13	8.1

Table 3 : Distribution According To Sleep Quality

Variables		Frequency (n=160)	Percentage (%)
Sub-jective sleep quality	Very good	21	13.1
	Fairly good	78	48.8
	Fairly bad	35	21.9
	Very bad	26	16.3
Sleep latency	<15 mins	18	11.3
	16-30 mins	42	26.3
	31-60 mins	70	43.8
	>60 mins	30	18.8
Sleep duration	>7 hours	29	18.1
	6-7 hours	84	52.5
	5-6 hours	34	21.3
	<5 hours	13	8.1
Habitual sleep efficacy (%)	>85	42	26.3
	75-84	94	58.8
	65-74	16	10.0
	<65	8	5.0
Sleep disturbances	0	21	13.1
	1-9	110	68.8
	10-18	11	6.9
	19-27	18	11.3
Use of sleep medications	Not during the past month	160	100
	Less than once a week	0	0
	Once or twice a week	0	0
	Three or more times a week	0	0
Daytime dysfunction	0	94	58.8
	1-2	35	21.9
	3-4	21	13.1
	5-6	10	6.3

Table 4 : Distribution According To Frequency Of GERD Symptoms As Per GERD Q Questionnaire

Variables	Number of days	Score	Frequency (n=160)	Percentage (%)
How often did you have burning feeling behind your breast bone?	0	0	59	36.9
	1	1	45	28.1
	2-3	2	31	19.4
	4-7	3	25	15.6
How often did you have stomach contents moving upwards to your throat or mouth?	0	0	87	54.4
	1	1	32	20.0
	2-3	2	29	18.1
	4-7	3	12	7.5
How often did you have a pin in the middle of the upper stomach?	0	3	109	68.1
	1	2	29	18.1
	2-3	1	17	10.6
	4-7	0	5	3.1
How often did you have nausea?	0	3	87	54.4
	1	2	54	33.8
	2-3	1	18	11.3
	4-7	0	1	0.6
How often did you have difficulty getting a good night's sleep because of your heartburn or regurgitation?	0	0	94	58.8
	1	1	39	24.4
	2-3	2	21	13.1
	4-7	3	6	3.8
How often did you take additional medication for your heartburn and / or regurgitation?	0	0	72	45.0
	1	1	58	36.3
	2-3	2	21	13.1
	4-7	3	3	1.9

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