International Journal of Community Medicine and Public Health
Krishnatreya M et al. Int J Community Med Public Health. 2022 Jun;9(6):2489-2492
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20221524

Original Research Article

Prevalence of sleep disorders among shift and day workers in industrial workers of North Guwahati, Assam

Mousumi Krishnatreya[1], Rinku Borah[2]*

[1]Department of Community Medicine, Gauhati Medical College, Guwahati, Assam, India
[2] Child health division, National health Mission, Assam, India

Received: 05 May 2022
Revised: 19 May 2022
Accepted: 20 May 2022

***Correspondence:**
Dr. Rinku Borah,
E-mail: drrinkuborahredhouse@gmail.com

ABSTRACT

Background: General sleep disorder and comorbid sleep disorder are highly prevalent in industrialized societies of India because of the work hours that displaces the sleep timing. There is rapid rise of Industries in the North Eastern region of the country, but research have been conducted on a sparse proportion of the population in this area. Aim of the study is to compare the prevalence of sleep disorder in shift worker and day worker based on international classification of sleep disorders (ICSD) criteria in a sample drawn from the working population of industries in North Guwahati, Assam.
Methods: Data was collected by administering a set of well validated questionnaire on a sample of 161 shift workers and 161 permanent day workers from 16 industries, from July to December 2021. Additional data concerning demographic profile were also analysed.
Results: Among the shift workers and day workers prevalence of general sleep disturbance was 34% and 19% respectively. Prevalence of insomnia, restless leg syndrome was found to be higher among the shift workers compared to day workers.
Conclusions: Shift workers experienced more difficulties with the variability of their sleep times. It was associated with a higher prevalence of ICSD-defined symptoms of sleep disorders like insomnia, obstructive sleep apnea and restless leg syndrome. Thus, the study may play a role in occupational health intervention aimed at reducing sleep problems and improving the resilience of shift worker especially in the areas of new industrial development.

Keywords: Shift worker, Sleep disorder, Day worker

INTRODUCTION

Sleep disorders are highly prevalent in industrialized societies. Shift work interferes with onset, maintenance and consolidation of sleep. It thus conflicts between day oriented circadian physiology, homeostatic sleep regulatory process and sleep functioning, thereby increasing the risk of sleep disorders leading to health problem like stressful social and familial conditions, cardiovascular disease, accidents and cancer.[1] Sleep-disorders are highly prevalent in industrialized societies. Variability in the symptomatology in sleep disorder is related to difference in the amount or quality of sleep obtained by individuals engaged in various types of shift work. Insomnia is the primary symptom and is the minimal criteria for sleep disorder, but it is not that unique.[2] Realizing the magnitude and huge economic impact, sleep medicine is an established discipline in developed countries. In India it is a new discipline practiced only in metropolitan cities. Research have been conducted only on a sparse proportion of the population.[3] The study was conducted to estimate the prevalence of

sleep disorder among shift and day workers in industrial workers of North Guwahati, Assam.

METHODS

This was a institution based cross-sectional study conducted among industrial workers of North Guwahati, Assam from July-December 2021. Informed consent was taken after it was translated in local language. The pilot study assessed the feasibility and applicability of the questionnaire in 30 individuals and estimated problems in response. Based on studies done by other authors assuming prevalence of general sleep disorder to be 39% and 24.6% in shift and day workers 95% CI and 80% power the number of subjects estimated is 161 for each group using the following formula:[1]

$$n=(Z_{a/2} + Z\beta)^2 *[P_1(1-P_1)+P_2(1-P_2)]/(P_1-P_2)^2$$

Inclusion criteria

All subjects scheduled for shift and day duty were included. Shift work and day work timing taken were (6 am-2 pm) (2-10 pm) (10 pm-6 am) and (7 am-3 pm) respectively.

Exclusion criteria

Subjects who knew that they have sleep disorder and were on treatment. Subjects who did not give consent. Subjects were drawn from 16 industries, 10 subjects from each industry. Selection was done by simple random method. 2 extra sample were selected, one from the first industry and the other from the last industry. The 322 subjects were interviewed using pre-tested and validated proforma. GSAQ (2002) questionnaire was used which comprised 11 sleep items constructed as a question next to row of checkbox response options regarding symptom frequency over the last four weeks (never, sometimes, usually and always). It is presented on a single paper.

Header contains patient details and lays out symptom's complaints within a grid with easy patient response and clinical interpretation. It includes four of the six sleep disorders i.e., Insomnia, OSA, RLS and parasomnias based on ICSD criteria. Presence of any one or more of the above sleep disorders were considered to be having general sleep disorders.[3] Questions were put to the respondents after detailed explanation on the study. No clinical evaluation nor any lab investigation was undertaken during the study.

RESULTS

The study includes 322 subjects. Most of them were from Assam while few of them were from West Bengal, Bihar and Uttar Pradesh. Table 1 shows socio demographic data for the two work groups.

Mean age of the respondents was 35 and 39 years for shift and day workers respectively. Percentage of male was 68% and 51 % for shift and days workers respectively. Presence of partner was almost similar in both the groups. Workers were mostly higher secondary or degree passed.

Table 1: Socio demographic indicators.

Socio demographic indicators	Shift workers	Day workers
Age (mean years) (SD)	35 (1.40)	39 (1.40)
Sex (M:F)	109:52 (68%:32%)	82:79 (51%:49%)
Partner	118 (73%)	119 (74%)
Children at home	95 (59%)	101 (63%)
Education		
Illiterate	Nil	Nil
Primary school	14 (9%)	6 (4%)
High school	11 (7%)	8 (5%)
Higher secondary	74 (46%)	84 (52%)
Degree	62 (38%)	63 (39%)

Table 2: Sleep-disorders.

Variables		Shift workers	Day workers
Insomnia	Never, (A)	133 (82.60%)	146 (90.68%)
	Sometimes, (P)	9 (5.59%)	12 (7.45%)
	Usually, (P)	11 (6.83%)	2 (1.24%)
	Always, (P)	8 (4.96%)	1 (0.62%)
	Total	161	161
Restless leg syndrome	Never, (A)	138 (85.71%)	148 (91.92%)
	Sometimes, (P)	10 (6.21%)	8 (4.96%)
	Usually, (P)	11 (6.83%)	5 (3.10%)
	Always, (P)	2 (1.24%)	0
	Total	161	161
Obstructive sleep apnea	Never, (A)	106 (65.83%)	151 (93.78%)
	Sometimes, (P)	19 (11.80%)	7 (4.34%)
	Usually, (P)	29 (18.01%)	3 (1.86%)
	Always, (P)	7 (4.34%)	0
	Total	161	161
Parasomnias	Never, (A)	161	161
	Sometimes, (P)	0	0
	Usually, (P)	0	0
	Always, (P)	0	0
	Total	161	161

(P)- sleep disorder present, (A)- sleep disorder absent.

Group difference were found for insomnia, restless leg syndrome and parasomnia.

Prevalence of general sleep disorder was 34% (55) in shift and 19% (30) in day workers. The difference was statistically significant as shown (Table 3).

Table 3: Prevalence of general sleep disorder.

Variables	Shift workers, (n=161)	Day workers, (n=161)	Chi square, p value
Sleep disorder present	55 (34%)	30 (19%)	Chi square 9.99, <0.05
Sleep disorder absent	106 (66%)	131 (81%)	

DISCUSSION

The study shows mean age of the respondents was 35 and 39 years for shift and day workers. Presence of partner and children at home were almost similar for both the groups. The characteristics of the group were similar to the study done by Kerkhof.[1] It adds to findings of previous studies by showing that shift work compared to day work is associated with higher prevalence of ICSD defined sleep disorders. Though the prevalence was much higher compared to study done by Kerkhof and Drake.[1,2] In contrast to our study, study done among a healthy population in South India showed a higher prevalence of Sleep Related disorders.[6,9] Prevalence of insomnia was higher in shift workers (17.39%) compared to the day workers (9.3%). This finding matches the findings of study done by Drake but it is much higher compared to study done by Kerkhof.[1,2] Additionally the prevalence of restless leg syndrome was more in shift workers (14.28%) compared to day workers (8.07%), which adds to the findings of other authors.[1] Obstructive sleep apnea in shift workers is 34.16% and 6.21% in day workers. This is much higher compared to study done by Kerkhof, which shows prevalence rate of sleep related breathing disorder to be 6.8 in shift workers and 6.1 in day workers.

The study supports the view that shift work has affect on sleep pattern thus leading to sleep disorder. Additional studies are needed to determine the mechanism responsible for individual vulnerability to the negative consequences of shift work.

The present study reveals the prevalence of sleep disorders to be higher in shift workers than day workers in the industrial population. Lack of awareness is a major influencing factor. Thus, awareness on the importance of sleep hygiene as well as widening the subject of sleep medicine by including the industrial workers would be helpful to the decrease the morbidity related to the shift work.

Limitations

Sleep problems assessed in this study is only through questionnaire. It is not supported by any clinical examination or laboratory tests. The problem of sleep disorder might be more than the study results. Secondly, this was a cross-sectional study based only on the previous 4 weeks period. This might have the problem of recall bias. Moreover, findings by the use of only questionnaire might not be representative of the general sleep disorder. At last, to compare data between different studies in different regions is not completely effective due to variability in operational definitions and different measures/ questionnaires used to evaluate sleep.

CONCLUSION

Use of questionnaires is one of the easiest cost-effective tools, that can be utilized at field level for assessing prevalence at large scale. Shift work have a profound effect on sleep, starting from the most common disorder like insomnia to rare instances like restless leg syndrome. This disorder causes misalignment between the circadian cycle and the work schedule. Sleep medicine might be helpful to improve the sleep hygiene especially among the shift workers to improve the sleep pattern. Additional research is needed to determine the prevalence among general population, day workers and shift workers so as to develop countermeasures for the sleep disorders.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Kerkhof GA. Shift work and sleep disorder comorbidity tend to go hand in hand. Chronobiology Int. 2018;35(2):219-28.
2. Drake CL, Roehrs T, Richardson G, Walsh JK, Roth T. Shift Work Sleep Disorder: Prevalence and Consequences Beyond that of Symptomatic Day Workers. Sleep. 2004;27:8.
3. Klingman KJ, Jungquist CR, Perlis ML. Questionnaires that screen for multiple sleep disorders. Sleep Med Rev. 2017;32;37-44.
4. Akerstedt T, Wright KP. Sleep loss and fatigue in Shift Work and Shift Work Disorder. Sleep Med Clin. 2009;4:257-71.
5. Select Statistical Services. Sample size calculators. Available at: https://select-statistics.co.uk/calculators/. Accessed on 25 Feb, 2021.
6. Panda S, Taly AB, Sinha S, Gururaj G, Girish N, Nagaraja D. Sleep-related disorders among a healthy population in South India. Neurology India. 2012;60:1.
7. Colten HR, Altevogt BM (eds.). Sleep disorders and sleep deprivation: An unmet public health problem.

Washington DC: National Academies Press. 2006;67-209.
8. Kump K, Whalen C, Tishler PV, Browner I, Ferrette V, Strohl KP, et al. Assessment of the validity and utility of a sleep-symptom questionnaire. Am J Respir Crit Care Med. 1994;150:735-41.
9. Reddy EV, Kadhiravan T, Mishra HK, Sreenivas V, Handa KK, Sinha S, et al. Prevalence and risk factors of obstructive sleep apnea among middle-aged urban Indians: A community-based study. Sleep Med. 2009;10:913-8.

Cite this article as: Krishnatreya M, Borah R. Prevalence of sleep disorders among shift and day workers in industrial workers of North Guwahati, Assam. Int J Community Med Public Health 2022;9:2489-92.