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PREVALENCE OF EXCESSIVE DAYTIME SLEEPINESS (EDS) AMONG NIGHT SHIFT BUS CONDUCTORS

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ABSTRACT

Excessive daytime sleepiness is a common symptom occurring due to night shift work. Literature shows an increase in Excessive daytime sleepiness among shift workers worldwide. Participants were 80 healthy male volunteers of the age group 20-58 years. Excessive daytime Sleepiness was assessed using the Epworth Sleepiness Scale. The results indicated that 34 bus conductors i.e. 42.5% were reported to have Excessive daytime Sleepiness as their total score was more than 10 and 46 bus conductors i.e. 57.5% were not found to have Excessive daytime sleepiness as their total score was less than 10. The study concludes that there is an increased prevalence of Excessive daytime sleepiness among night shift bus conductors. The present study suggests a need for the implementation of sleeping and fatigue management programs for bus conductors in order to improve working efficiency and prevent accidents during work.

KEYWORDS: Excessive Daytime Sleepiness (EDS), Epworth Sleepiness Scale (ESS), Night Shift Bus Conductors.

INTRODUCTION

Night shift work is defined as work of ≥ 3 hours between 11:00 PM to 6:00AM and may be organized in many ways including 2 or 3 shift work, irregular schedules, and permanent night shift work.[1,2] Bus conductors form an important subset of night shift workers. They work in different shift including late night shifts.

Bus conductors are prone to develop sleep disorders due to late night shifts. Night work has been associated with reduced sleep duration typically ranging from 4–7 h, symptoms of insomnia during the main sleep period and sleepiness across wake periods.[3,4,5,6,7,8] Slower performance at work especially when measured during the first night shift has also been reported.[7,9,10,11,12]

These sleep and cognitive deficits may lead to enhanced injury risk in working environments. According to the 2010 National Health Interview Survey, less than 6 h of sleep per night is associated with an 86% increased risk in work-related injury compared to 7–8 h of sleep.[13] Night Shift work is responsible for disrupting circadian rhythms and affecting sleep quality. Circadian rhythms in physiological functions are pivotal for survival.[14] They are primarily synchronized to the light–dark cycle by light exposure through the eyes, which excites the intrinsically photosensitive retinal ganglion cells (ipRGC). The ipRGC are connected to the suprachiasmatic nucleus (SCN) located in the hypothalamus.[15]

Virtually all cells in the body have molecular clocks that are normally synchronized by the master clock in the SCN. Projections from the SCN innervate the sympathetic nervous system and other structures such as the pineal gland, which regulates downstream peripheral oscillators via humoral, endocrine, and neural signals, resulting in a coherent time organization of bodily processes for optimal performance.[16] Melatonin is a hormone mainly produced in the pineal gland under direct control of the circadian timing system.

Thus, melatonin production is controlled by the light–dark cycle exposure, and its plasma concentration signalizes this to virtually all organs and tissues. Therefore, melatonin is essential to maintain the internal circadian synchronization and regulate the sleep–wake cycle. The term “circadian disruption” is used in a broad sense to cover the changes in the circadian rhythm such as amplitude, duration, and timing of biological rhythms and objective or subjective proxies of changed circadian rhythm.[17]

Disruption in circadian rhythm can lead to sleep disturbances like insomnia, excessive daytime sleepiness, and poor sleep quality.[18]

METHODOLOGY

The study was performed in Mumbai Central Bus Depot, Mumbai Central , Maharashtra, India. It was a observational study based on a questionnaire. Ethical clearance was obtained

from the institutional ethical committee. Selection of subjects was done as per the inclusion and exclusion criteria. A written informed consent was taken from the subjects in the language better understood by them. Purpose of study and procedure was explained to the subjects prior to assessment. Participants were 80 healthy male volunteers of the age group 20-58 years excluding those who already been diagnosed to have a sleep disorder and were on treatment for the same. Subjects was assessed for excessive daytime sleepiness using Epworth Sleepiness scale. Epworth Sleepiness Scale has 8 questions and total of 24 points which requires the subject to rate his/her chance of falling asleep on a scale of increasing probability from 0-3 for eight different situations. 0 signifies no dozing, 1-mild chance of dozing, 2-moderate chance of dozing and 3- high chance of dozing. The participants were scored as no Excessive daytime sleepiness if the total score is <10 and presence of Excessive daytime sleepiness if the total score is ≥10. Based on the total score of Epworth Sleepiness Scale the Excessive daytime sleepiness among bus conductors was identified.

RESULTS

According to Epworth Sleepiness Scale it is revealed that 34 bus conductors i.e. 42.5% were reported to have Excessive daytime sleepiness as their total score was more than 10 and 46 bus conductors i.e. 57.5% were not found to have Excessive daytime sleepiness as their total score was less than 10. (FIG 1.)

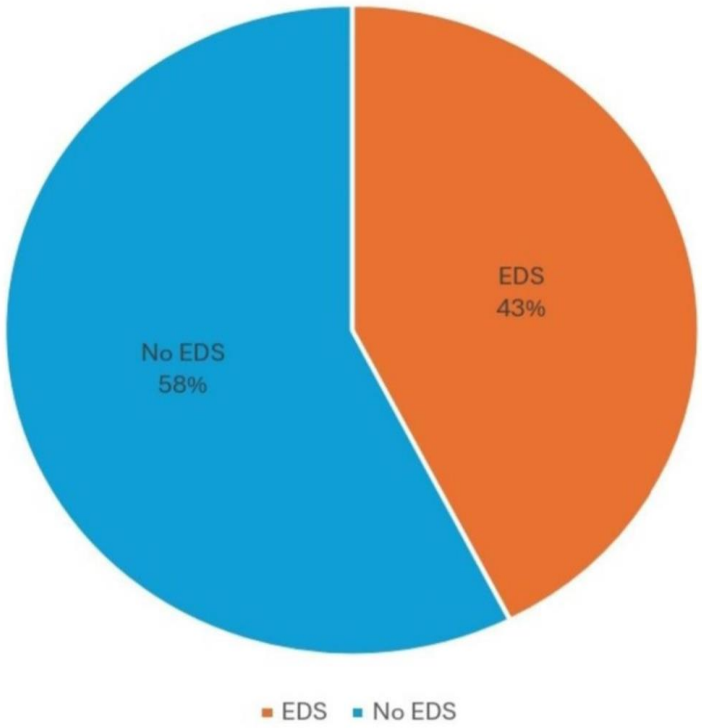

Fig. 1: Overall prevalence of excessive daytime sleepiness.

Analysis of dozing in different situation

- Sitting and reading – Higher number of bus conductors reported no dozing (36.25%) and least number reported moderate dozing (13.75%).
- Watching TV – Higher number of bus conductors reported no dozing (30%) and least number reported severe dozing (13.75%).
- Sitting inactive in a public place – Higher number of bus conductors reported no dozing (57.5%) and least number reported severe dozing (0%).
- As a passenger in car for an hour – Higher number of bus conductors reported mild dozing (50%) and least number reported moderate dozing (6.25%)
- Lying down in the afternoon – Higher number of bus conductors reported severe dozing (56.25%) and least number reported no and mild dozing (0%).
- Sitting and talking to someone – Higher number of bus conductors reported no dozing (57.5%) and least number reported severe dozing (0%).
- Sitting quietly after lunch without alcohol – Higher number of bus conductors reported severe dozing (63.75%) and least number reported no dozing (0%).
- In car while stopping in traffic for few minutes –Higher number of bus conductors reported mild dozing (40%) and least number reported severe dozing (1.25 %).

Table 1: Analysis of dozing in different situation.

Situations	No Dozing (%)	Mild Dozing (%)	Moderate Dozing (%)	Severe Dozing (%)
Sitting and reading	36.25	35	13.75	15
Watching TV	30	27.5	28.75	13.75
Sitting inactive in a public place	57.5	15	27.5	0
As a passenger in car for an hour	7.5	50	6.25	36.25
Lying down in afternoon	0	0	43.75	56.25
Sitting and talking to someone	57.5	21.25	21.25	0
Sitting quietly after lunch without alcohol	0	22.5	13.75	63.75
In car while stopping in traffic for few minutes	28.75	40	30	1.25

DISCUSSION

The current study was aimed to estimate Excessive daytime sleepiness prevalence among night shift bus conductors in Mumbai. The study included 80 participants. We assessed Excessive daytime sleepiness with help of Epworth Sleepiness Scale. The results indicated that 34 bus conductors i.e. 42.5% were reported to have Excessive daytime sleepiness as their

total score was more than 10 and 46 bus conductors i.e. 57.5% were not found to have Excessive daytime sleepiness as their total score was less than 10.

A similar study was conducted by Kyung Hyun Son et al. to find out Daytime Sleepiness and Fatigue in Male Adults in relation to Shift Work.[20] One hundred and twenty two shift workers, and two hundred and fifty four non-shift workers, were selected and identified in terms of their general characteristics, such as age, tenure, educational level, marital status and religion. Screening questionnaires were composed of the Epworth Sleepiness Scale (ESS) for evaluation of daytime sleepiness, the Multidimensional Fatigue Scale (MFS) for fatigue, and the Korean version of the National Institute for Occupational Safety and Health (NIOSH) for sleeping patterns. According to the result the shift worker group reported significantly higher rates of sleep disturbance and higher fatigue scores compared with the non-shift workers (all $p<0.01$). The prevalence of daytime sleepiness was higher in the shift workers (19.7%) than the non-shift workers (10.6%) ($p<0.05$). The significant daytime sleepiness-related factors were found to be shift work, tenure and difficulties in falling back to sleep once woken ($p<0.05$). Shift work was proved to be an important factor in workers aged less than 40 years ($p<0.05$). However, this association was not evident in workers aged 40 years and over. This study concluded that the shift workers showed a significantly higher prevalence of daytime sleepiness compared with the non-shift workers. This study suggested that their a need for the implementation of sleeping and fatigue management programs for shift workers in order to improve working efficiency and control safety accidents during shift work.

Another study was conducted by Siddalingaiah H. S. et al. to find out Prevalence and determinants of excessive daytime sleepiness among Resident doctors at a tertiary care institution in India.[22] A cross-sectional study was designed and a list of all enrolled medical residents was obtained (N=430). The eligible subjects (N=428) were interviewed and administered the study instruments. The information on socio-demographics and sleep-related factors were collected using the sleep assessment proforma. The Epworth sleepiness Scale (ESS) was used to measure excessive daytime sleepiness (EDS) and the sleep hygiene index (SHI) was used to Measure sleep hygiene. Data were analyzed with appropriate statistical methods. According to the result a total of 350 residents responded (82%). The prevalence of EDS and Maladaptive sleep hygiene were 47.4% and 85.5% respectively. A positive association was found between EDS and weekly work hours, SHI score, Sleep duration, sleep quality, midnight awakenings, clinical stream, and rotating shift work. Coffee intake and

Smoking within 4 hours of bedtime, restless legs and allergies had weak association with EDS. This study concluded that EDS and unhygienic sleep were highly prevalent among resident doctors. The factors associated with EDS were mainly related to work, sleep quantity, sleep quality and sleep hygiene which are amenable to suitable modifications by behavioural change communications, awareness programs and by administrative actions.

Although above researches focused on a different population. Underlying principle remains relevant: night shift work is responsible for excessive daytime sleepiness. Therefore, integrating awareness programs, early lifestyle modifications and administrative actions can prevent excessive daytime sleepiness. Also individuals with Excessive daytime sleepiness were reported to have psychological problems like irritability and decreased quality of interpersonal relationships.[21] All these factors can ultimately impair the quality of life and reduce the lifespan of the affected individual. This can be prevented by early lifestyle modifications with the complete understanding and co-operation of the affected individual.

CONCLUSION

The current study shows an increased prevalence of Excessive daytime sleepiness among night shift Bus conductors.

Bus conductors with Excessive daytime sleepiness are more prone for sleep and associated disorder.

The present study suggests a need for the implementation of sleeping and fatigue management programs for bus conductors in order to improve working efficiency and control accidents during work.

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REFERENCES

1. Härmä M, Ropponen A, Hakola T, Koskinen A, Vanttola P, Puttonen S, etal. (Developing register-based measures for assessment of working time patterns for Epidemiologic studies). Scand J Work Environ Health, 2015 May; 41(3): 26879.
2. IARC Working Group on the (Identification of Carcinogenic Hazards to Humans. Night Shift Work.) Lyon: International Agency for Research on Cancer; 2020.

3. Boivin DB, Boudreau P, James FO, Kin NM (2012) (Photic resetting in night-shift Work: Impact on nurses' sleep). Chronobiol Int., 29: 619-628.
4. Paech GM, Jay SM, Lamond N, Roach GD, Ferguson SA (2010) (the effects of Different Roster schedules on sleep in miners). Appl Ergon, 41: 600606.
5. Drake CL, Roehrs T. Richardson G, Walsh JK, Roth T (2004) (Shift work sleep Disorder: Prevalence and consequences beyond that of symptomatic day workers), Sleep 27: 1453-1462.
6. Garde AH, Hansen AM, Hansen J (2009) (Sleep length and quality, sleepiness and Urinary melatonin among healthy Danish nurses with shift work during work and leisure Time). Int Arch Occup Environ Health, 82: 1219-1228.
7. Axelsson J, Kecklund G, Akerstedt T. Donofrio P. Lekander M, et al. (2008) (Sleepiness and Performance in response to repeated sleep restriction and subsequent Recovery during semi-laboratory conditions). Chronobiol Int., 25: 297-308.
8. Di Milia L, Rogers NL, Akerstedt T (2012) (Sleepiness, long distance commuting and Night work as predictors of driving performance). PLoS One, 7: 045856.
9. Boivin DB, Boudreau P, Tremblay GM (2012) (Phototherapy and orange-tinted Goggles for Night-shift adaptation of police officers on patrol). Chronobiol Int., 29: 62964024.
10. Smith MR, Fogg LF, Eastman C1 (2009) (A compromise circadian phase position for Permanent night work improves mood, fatigue, and performance). Sleep, 32: 1481-1489.
11. Lamond N, Dorrian J, Roach GD, McCulloch K, Holmes AL, et al. (2003) (The impact Of a Week of simulated night work on sleep, circadian phase, and performance). Occup Environ Med., 60: e13.
12. Bjorvatn B, Stangenes K, Oyane N, Forberg K, Lowden A, et al. (2006) Subjective and objective measures of adaptation and readaptation to night work on an oil rig in the North Sea)., Sleep 29: 821-829.
13. Lombardi DA, Wirtz A, Willetts JL., Folkard S (2012) (Independent effects of sleep duration And body mass index on the risk of a work-related injury: evidence from the US National Health Interview Survey) (2004-2010). Chronobiol Int., 29: 556-564.
14. Buijs RM, van Eden CG, Goncharuk VD, Kalsbeek A. (The biological clock tunes the organs of the body timing by hormones and the autonomic nervous system). J Endocrinol, 2003 Apr; 177(1): 17-26. Doi:10.1677/joe.0.1770017
15. Hattar S. Liao HW, Takao M, Berson DM, Yau KW.(Melanopsin-containing retinal ganglion Cells: architecture, projections, and intrinsic photosensitivity), Science, 2002 Feb; 295(5557): 106570.

16. Haus EL, Smolensky MH.(Shift work and cancer risk:potential mechanistic roles of Circadian disruption, light at night, and sleep deprivation). Sleep Mod Rev., 2013 Aug, 17(4): 273-84.
17. Vetter C.(Circadian disruption: what do we actually mean?) Eur J Neurosci., 2020 Jan; 51(1): 531-50.
18. Phyllis C. Zee, Hrayr Attarian, Aleksandar Videnovic.(Circadian Rhythm Abnormalities), February 2013; 19(1): 132-147.
19. M W Johns. (Reliability and Factor Analysis of the Epworth Sleepiness Scale), 1992 Aug; 15(4): 376-81.
20. Kyung Hyun Son, Soo Geun Kim, Young Woo Jin, Sung Hyo Kim, Soon Young Kim, Yoo Soon Bang, Sun Seog Kweon, Min Ho Shin, Seul Ki Jeong, Hae Sung Nam (Daytime Sleepiness And Fatigue in Male Adults in relation to Shift Work), 2005; 17(3): 199.
21. Giri PA, Baviskar MP, Phalke DB. (Study of Sleep Habits and Sleep Problems Among Medical Students of Pravara Institute of Medical Sciences Loni, Western Maharashtra, India), Ann Med Health Sci Res., 2013; 3:51: 4.
22. Siddalingaiah H. S., David F. Mastin, Bruce D. Moore, W. Jeff Bryson, Chandrakala D., Amarjeet Singh (Prevalence and determinants of excessive daytime sleepiness among Resident Doctors at a tertiary care institution in India). Int J Community Med Public Health, 2018 Apr; 5(4): 1407-1413.