

Prevalence of sleep disorders and association with various occupations among Indian population aged ≥ 45 years: Insight from Longitudinal Ageing Study in India (LASI)

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ABSTRACT

Introduction: By scrutinizing the impact of job schedules, workplace culture and stress levels, our study aims to determine the prevalence of sleep disorders among various occupations and its associated factors. The findings promise to enhance the overall well-being, sleep quality and productivity in various occupational settings. **Methods:** This is an analytical cross-sectional study involving secondary data from the nationally representative Longitudinal Ageing Study in India (LASI Wave I 2017-18) of 35 Indian states and union territories with exception of Sikkim. The study included 59441 Indian volunteers who older than 45 years. Multivariable logistic regression analysis was conducted to study the association of sleep disorders among various occupations while accounting for other associated factors. **Results:** Prevalence of sleep disorders was higher among the females (12.66%), unemployed (13.34%), ≥ 60 -yr age group (13.45%), those who lived in rural areas (12.35%), those who were illiterate (12.80%) and reported themselves to be widowed, separated or divorced (14.54%), people with no health insurance (11.74%), smokers (12.11%), without physical activity (12.67%) and also rated themselves as poor in the self-rated health status (26.77%). Alcohol consumption was not statistically significant factor for sleep disorders. **Conclusions:** There is an emerging need for targeted screening, prompt detection and early management of insomnia and other sleep disorders among the high-risk groups. Provision of accessible and affordable screening tools, training skills for early diagnosis at primary care level and/or proper referral services to higher centres form the cornerstone for adequate management of sleep disorders.

Keywords: LASI, occupations, prevalence, sleep, sleep disorders

Introduction

Sleep is a fundamental and crucial component of human existence because it plays a vital role in our physical, emotional

and mental well-being thereby contributing to our optimal functioning. The importance of sleep cannot be over-elaborated because it affects almost every aspect of our lives, from our health and cognitive ability to our overall quality of life (QoL). The quality of sleep is influenced by a variety of factors such as sleep environment, sleep routine, circadian rhythms, stress and mental health, physical activity, diet and nutrition, exposure to screens, and other medical conditions.

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The modern lifestyle involves frequent travel to different time zones, shift work, irregular work hours to achieve goals and deadlines, and living in a nuclear family, all of which alter sleep patterns and reduce the amount of time that is optimally spent sleeping. During sleep, the brain creates new neural pathways for processing and remembering information, preparing it for the activities of the next day.^[1,2]

In addition to understanding the factors influencing the quality of sleep, it is important to study the determinants that impact an individual's sleeping patterns. Occupational and non-occupational factors have a major role in the patterns and practices of sleep among various categories of people.

Sleep patterns can differ significantly across different occupations, reflecting the varied demands and challenges that individuals face in the professional realm. The interaction between work and sleep is a complex and dynamic association, influenced by factors such as job schedules, stress levels, physical demands, and workplace culture.

Objective

The main objective of this analysis is to provide a comprehensive scientific evidence based on prevalence of sleep disorders and association with various occupations among Indian population aged ≥ 45 years.

- To determine the prevalence of sleep disorder among various occupations
- To show the association between sleep disorder and various occupations

Methods

The current analysis used LASI-1st wave data from 35 Indian states and union territories (UTs), with the exception of Sikkim. It is a longitudinal survey with a national representation that intends to collect detailed information on the psychological, social, economic, and health aspects of ageing in India. It was created to close the knowledge gap about comprehensive and globally comparable survey data on ageing in India. The National Institute on Ageing, the Government of India's Ministry of Health and Family Welfare, and the United Nations Population Fund all provided funding for the study. The University of Southern California, the International Institute for Population Sciences, and the Harvard T.H. Chan School of Public Health are working together on it. The demography, health, economy, and social factors are just a few of the important topics it focuses on. There were 73,000 adult Indians in LASI. 66,606 Indian volunteers above the age of 45 were included in the current study.

The study, which is the biggest of its kind in the world and the first of its kind in India, evaluates the scientific evidence in the context of variables such as demographics, household economic status, chronic health conditions, symptom-based health conditions, functional health, mental health (cognition and

depression), biomarkers, healthcare utilisation, family and social networks, social welfare programmes, employment, retirement, satisfaction, and life expectations. The survey intends to follow a representative sample of the older adult population every two years for the following 25 years, with a revised sample size to account for attrition because of death, migration, non-reachable, and non-response.^[1]

Outcome variable

Sleep disorder was the explanatory variable of interest. It was derived from four items (during the last month) from the Jenkins Sleep Scale (JSS-4), which was used in the LASI survey.^[3] The items were "i) How often do you have trouble falling asleep?" ii) "How often do you have trouble with waking up during the night?" iii) "How often do you have trouble with waking up too early and not being able to fall asleep again?" and iv) "How often did you feel unrested during the day regardless of the number of hours of sleep you had?" Options for the responses were "never," "rarely," (1 to 2 nights per week) "occasionally," (3 to 4 nights per week) and "frequently" (≥ 5 nights per week).^[4,5] Sleep disorder was classified as "yes" if any of the responses from the above 4 questions were "frequently." Rest were classified as "no" sleep disorder.^[6] The Cronbach's alpha (internal consistency) of JSS-4 was 0.86. This scale provided good construct validity and excellent reliability.^[7]

Explanatory variables

The explanatory variable of choice was occupation, which was categorised as (unemployed, professional and semi-professional 'legislators and senior officials, professionals, technicians and associate professionals', clerical and skilled 'clerks, service workers and shopkeepers, skilled agriculture and fishery workers, craft and related trade worker, plant and machine operator', or unskilled),

Job requirements ('lot of physical activity'/'lifting heavy loads'/'stooping, kneeling, or crouching', 'good eyesight'/'intense concentration or attention'/'skill in dealing with other people'/'around burning material, exhaust, or smoke'/'close to chemical/pesticide/herbicide'/'close to noxious odour') were categorised as frequently ('all or almost all of the time' or 'most of the time') and seldom ('sometimes' or 'none of the time or almost never'). Age, gender, minimum education (illiterate, less than primary, primary completed, middle completed, secondary school, higher secondary, and diploma/graduate), residence (rural, urban), marital status (unmarried, married/in live-in, widow/separated/divorced), monthly per capita expenditure (MPCE—poorest, poorer, middle, richer, or richest) quintile, health insurance (no or yes), physical activity (every day, once per week, 1-3 times per week, once per month, or never), self-rated health (excellent, very good, good, fair, or poor), and alcohol consumption (no or yes) were taken as other explanatory variables.

To conduct this study, we have removed data of participants younger than 45 years. After adjusting missing data by row-wise

Table 1: Various characteristics of Indian population aged ≥ 45 years

Variable	Overall population (≥ 45 years)		
	Total (n=59441) n (%)	Sleep disorder (n=6948) (11.69%) n (%)	Chi-square, P
Occupation			
Unemployed	30,178 (50.77)	4,026 (13.34)	<0.001
Professional and semi-professional	1,342 (53.03)	94 (7.00)	
Clerical and skilled	15,096 (25.40)	1,594 (10.56)	
Unskilled	12,825 (21.58)	1,234 (9.62)	
Type of employer			
Government sector	2,412 (30.26)	169 (7.01)	<0.001
Private/organization/entrepreneur	3,382 (42.43)	322 (9.52)	
Cooperative	140 (1.76)	7 (5.00)	
Ngo/trust	274 (3.44)	26 (9.49)	
Individual household	1,436 (18.02)	130 (9.05)	
Others	327 (4.1)	47 (14.37)	
Sex			
Male	27541 (46.33)	2910 (10.57)	<0.001
Female	31900 (53.67)	4038 (12.66)	
Age (years)			
45-59	31234 (52.55)	3154 (10.10)	<0.001
≥ 60	28207 (47.45)	3794 (13.45)	
Education (minimum)			
Illiterate	28,046 (47.18)	3,591 (12.80)	<0.001
Less than primary	6,938 (11.67)	868 (12.51)	
Primary completed	7,922 (13.33)	964 (12.17)	
Middle completed	5,691 (9.57)	593 (10.42)	
Secondary school	5,223 (8.79)	493 (9.44)	
Higher secondary	2,480 (4.17)	215 (8.67)	
Diploma/graduate	3,141 (5.28)	224 (7.13)	
Residence			
Rural	39133 (65.84)	4832 (12.35)	<0.001
Urban	20308 (34.16)	2116 (10.42)	
Marital Status			
Unmarried	706 (1.19)	64 (9.07)	<0.001
Married/in live-in	44879 (75.50)	4870 (10.85)	
Widow/separated/divorced	13856 (23.31)	2014 (14.54)	
MPCE quintile			
Poorest	11,783 (19.82)	1,330 (11.29)	0.013
Poorer	12,022 (20.23)	1,361 (11.32)	
Middle	12,032 (20.24)	1,364 (11.34)	
Richer	11,961 (20.12)	1,450 (12.12)	
Richest	11,643 (19.59)	1,443 (12.39)	
Health insurance			
No	58138 (97.81)	6826 (11.74)	0.008
Yes	1303 (2.19)	122 (9.36)	
Physical activity			
Everyday	14,366	1,416 (9.86)	<0.001
More than once week	4,201	424 (10.09)	
Once/week	2,207	250 (11.33)	
1-3 times/month	3,022	342 (11.32)	
Never	35,645	4,516 (12.67)	
Self-rated health			
Excellent	2,299 (3.87)	156 (6.79)	<0.001
Very good	11,323 (19.05)	806 (7.12)	
Good	23,442 (39.45)	2,000 (8.53)	
Fair	16,552 (27.85)	2,427 (14.66)	
Poor	5,813 (9.78)	1,556 (26.77)	
Tobacco abuse			

Contd...

Table 1: Contd....

Variable	Overall population (≥ 45 years)		
	Total (n=59441) n (%)	Sleep disorder (n=6948) (11.69%) n (%)	Chi-square, P
No	37626 (63.30)	4306 (11.44)	<0.001
Yes	21815 (36.70)	2642 (12.11)	
Alcohol abuse			0.202
No	48778 (82.06)	5740 (11.77)	
Yes	10663 (17.94)	1208 (11.33)	

deletion and excluding BMI outliers, we have included participants who documented their sleep disorder status. Details are provided in Figure 1. Thus, this secondary study of LASI-first wave data included information from 59411 participants.

Statistical analysis

Data were analysed in Stata version 17 (StataCorp. 2017. Stata Statistical Software: Release 17. College Station, TX: StataCorp LP). Characteristics of participants were described as median (IQR) for non-parametric continuous variables and frequencies and percentage for categorical variables (age group, occupation, and body mass index (BMI) categories). Univariate logistic regression was conducted between outcome variable and each explanatory variable. To avoid multicollinearity among explanatory variables, variance inflation factor (VIF) was applied. VIF >5 indicates high correlation between a given explanatory variable and other explanatory variables in the model, which might create problems with the regression analysis. Marital status and self-rated health had VIF >5 . Hence, these two explanatory variables were excluded for final association. P -value <0.05 was considered as statistically significant. P -value <0.2 was taken for further multivariable logistic regression. Association was calculated in overall population and was further categorised as per gender and age groups.

Ethics

Ethical approval was granted by the Indian Council of Medical Research.^[1]

Results

Total participants in the study were 73,396 of which 46.33% were males and the remaining 52.55% were females. About 50.77% of the total population were unemployed, 53.03% were professional and semi-professional workers, 25.40% were clerical and skilled workers and the remaining 21.58% were unskilled workers.

Sleep disorders were found to be significantly higher ($P < 0.001$) among females (12.66%), the unemployed (13.34%), the ≥ 60 -yr age group (13.45%), those who lived in rural areas (12.35%), those who were illiterate (12.80%) and reported themselves to be widowed, separated or divorced (14.54%).

Highest sleep disorders were reported among those who did not have any kind of health insurance (11.74%), those who were not involved in any kind of physical activity (12.67%) and also rated themselves as poor in the self-rated health status (26.77%).

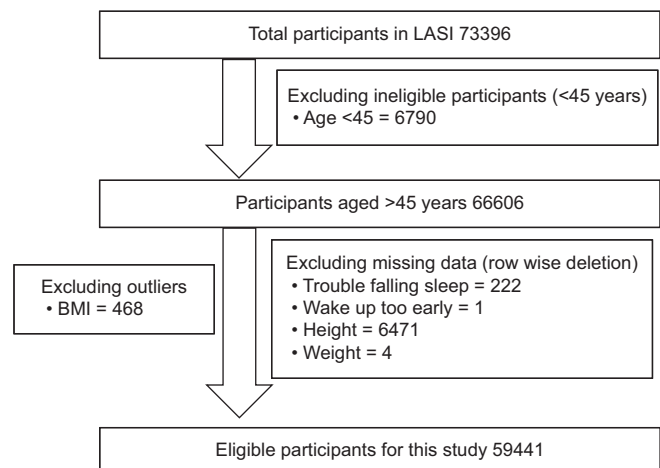


Figure 1: Flowchart showing participant selection process in this study

Sleep disorders were most commonly found among the smokers (12.11%). Statistically significant relationship was not observed between alcohol consumption and sleep disorders [Table 1].

Sleep disorders were found to be higher among those occupations that required exposure to noxious odours, chemicals, pesticides or herbicides, burning material, exhaust, or smoke most of the time. Although these disorders were more among the occupations that never required dealing with people, nor required good eyesight, nor with those who never had to lift heavy loads, it was more among those occupations that required the workers to stoop, kneel or couch [Figure 2].

Univariate and multivariable regression analysis was performed to find out the association between sleep disorders and various occupations. Model 1 was adjusted for age, and model 2 was adjusted for all the factors associated with the occurrence of sleep disorders with P -value < 0.05 as depicted in Table 2.

Those who were unemployed were 1.26 times as likely (aOR = 1.26, 95% CI = 1.13-1.14), and those who were clerical and skilled professions had 1.11 times the odds of having sleep disorder (aOR = 1.11, 95% CI = 1.03-1.20).

Those who lifted heavy loads frequently were at lower risk of having sleep disorders (aOR = 0.90, 95% CI = 0.82-0.98).

The occupations that required staying close to noxious agents frequently had 1.32 times higher odds of having sleep disorders (aOR = 1.32, 95% CI = 1.14-1.53).

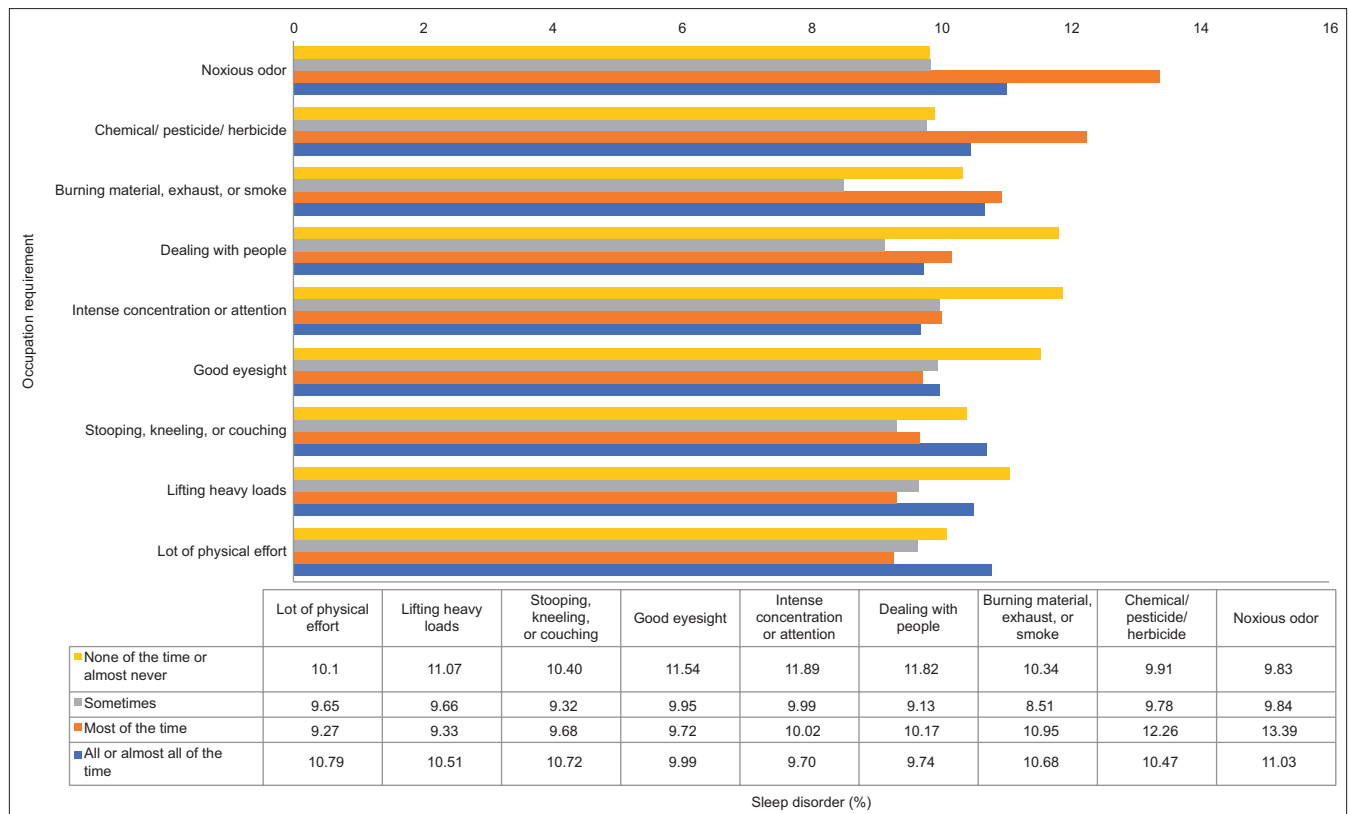


Figure 2: Distribution of participants as per occupation requirements and sleep disorder

Those who were employed under private employer/organisation/working as an entrepreneur had 1.39 times higher odds of having sleep disorder (adjusted odds ratio 1.39 and 95% CI = 1.12-1.79).

Discussion

This analysis aimed to examine the factors that affect the quality of sleep, emphasizing the importance of exploring determinants influencing individual's sleep patterns and the role of occupational factors that are responsible for the sleep disorders.

Sleep disorders were found to be significantly higher (12.66%) among women, which might be because the female population in this analysis was of the menopausal transition group, i.e. the perimenopausal and the menopausal age group females. One major symptom of the menopausal transition is disturbances in sleeping habits because of hormonal fluctuations. Peri-menopausal women often complain of difficulties initiating and/or maintaining sleep with frequent nocturnal and early morning awakenings causing insomnia.^[8-10]

Unemployed individuals were found to have higher rates of sleep disorders as compared to the otherwise employed population. According to the literature, unemployed individuals were found to have 1.5 times greater odds of being diagnosed with insomnia characterised by sleep loss and disruption because of stressors from income and financial inequalities resulting from their unemployment.^[11-14]

Among the 45- to 59-yr age group and >60 yrs, the latter was found to have a significantly higher prevalence of sleep disorders (13.45%). Factors such as the sleep environment, co-existing comorbidities and chronic non-communicable diseases such as diabetes, hypertension, etc., pharmacokinetics of the medications consumed for the existing multimorbidity, and medical and psychiatric disorders can increase the risk of insomnia among the elderly.^[15-19]

The literature on the relationship between sleep and employment status in Indian population is very limited. However, in the American and the European context, data obtained from the American Time Use Survey (ATUS): 2003 to 2012, Antillón *et al.* (2015)^[20] found that increases in the unemployment rate increased sleep duration: A 1-percentage point increase in unemployment was correlated with an extra 2.83 min of sleep.

Smoking or any substance abuse as such has been proven to interfere with sleeping pattern and quality of individuals of any age. In a systematic review and meta-analysis by Amiri S *et al.*, the results indicated that smoking is associated with a risk of development of sleep-related issues with the RR = 1.47.^[21] Li H *et al.*'s study showed that cigarette smoking was associated with sleep disturbances, characterised by poor sleep quality, prolonged sleep onset latency and higher dopamine levels in CSF of active smokers compared with non-smokers, which is consistent with our study that the smoking has significant association with sleep disorders.^[22]

Table 2: Univariate and multivariable logistic regression of sleep disorder and various occupation

Characteristics	Univariate		Multivariable	
	Crude odds ratio (95% Confidence interval)	P	Adjusted odds ratio (95% Confidence interval) Model 2	P
Occupation				
Unskilled	Reference	-	Reference	-
Unemployed	1.45 (1.35-1.55)	<0.001	1.26 (1.13-1.41)	<0.001
Professional and semi-professional	0.71 (0.57-0.88)	0.002	0.93 (0.74-1.17)	0.555
Clerical and skilled	1.11 (1.03-1.20)	0.010	1.11 (1.03-1.20)	0.010
Occupation requirement				
Lot of physical activity				
Seldom	Reference	-	Reference	-
Frequent	0.79 (0.75-0.84)	<0.001	1.01 (0.92-1.12)	0.814
Lifting heavy loads				
Seldom	Reference	-	Reference	-
Frequent	0.79 (0.74-0.84)	<0.001	0.90 (0.82-0.98)	0.028
Stooping, kneeling, or crouching				
Seldom	Reference	-	Reference	-
Frequent	0.81 (0.77-0.86)	<0.001	1.04 (0.95-1.15)	0.362
Good eyesight				
Seldom	Reference	-	Reference	-
Frequent	0.75 (0.71-0.79)	<0.001	1.02 (0.92-1.15)	0.673
Intense concentration or attention				
Seldom	Reference	-	Reference	-
Frequent	0.75 (0.71-0.79)	<0.001	0.94 (0.84-1.06)	0.302
Skill in dealing with other people				
Seldom	Reference	-	Reference	-
Frequent	0.77 (0.73-0.82)	<0.001	1.03 (0.94-1.13)	0.512
Close to burning material, exhaust or smoke				
Seldom	Reference	-	Reference	-
Frequent	0.91 (0.81-1.04)	0.164	-	-
Close to chemical/pesticide/herbicide				
Seldom	Reference	-	Reference	-
Frequent	0.99 (0.87-1.13)	0.899	-	-
Close to noxious odor				
Seldom	Reference	-	Reference	-
Frequent	1.07 (0.93-1.23)	<0.001	1.32 (1.14-1.53)	<0.001
Type of employer				
Government sector	Reference	-	Reference	-
Private/organization/entrepreneur	1.40 (1.15-1.70)	0.001	1.39 (1.12-1.72)	0.003
Cooperative	0.69 (0.32-1.52)	0.365	0.73 (0.33-1.58)	0.421
Ngo/trust	1.39 (0.90-2.14)	0.135	1.42 (0.91-2.22)	0.119
Individual household	1.32 (1.04-1.68)	0.022	1.21 (0.93-1.59)	0.160
Others	2.23 (1.58-3.15)	<0.001	1.96 (1.35-2.83)	<0.001
Age group (years)				
45-59	Reference	-	Reference	-
≥ 60	1.38 (1.32-1.46)	<0.001	1.24 (1.17-1.31)	<0.001
Gender				
Male	Reference	-	Reference	-
Female	1.23 (1.17-1.29)	<0.001	1.10 (1.17-1.31)	<0.001
Education (minimum)				
Illiterate	Reference	-	Reference	-
Less than primary	0.97 (0.90-1.05)	0.510	1.01 (0.93-1.09)	0.841
Primary completed	0.94 (0.87-1.02)	0.130	1.00 (0.92-1.08)	0.946
Middle completed	0.79 (0.72-0.87)	<0.001	0.86 (0.78-0.94)	0.002
Secondary school	0.71 (0.64-0.78)	<0.001	0.76 (0.68-0.84)	<0.001
Higher secondary	0.65 (0.56-0.75)	<0.001	0.70 (0.60-0.81)	<0.001
Diploma/Graduate	0.52 (0.45-0.60)	<0.001	0.56 (0.48-0.66)	<0.001

Contd...

Table 2: Contd...

Characteristics	Univariate		Multivariable	
	Crude odds ratio (95% Confidence interval)	P	Adjusted odds ratio (95% Confidence interval) Model 2	P
Residence				
Urban	Reference	-	Reference	-
Rural	1.21 (1.15-1.29)	<0.001	1.13 (1.07-1.21)	<0.001
MPCE quintile				
Poorest	Reference	-	Reference	-
Poorer	1.00 (0.92-1.08)	0.940	1.01 (0.94-1.11)	0.572
Middle	1.00 (0.92-1.08)	0.970	1.05 (0.97-1.14)	0.253
Richer	1.08 (0.99-1.17)	0.054	1.17 (1.08-1.26)	<0.001
Richest	1.11 (1.02-1.20)	0.010	1.26 (1.16-1.37)	<0.001
Health insurance				
No	Reference	-	Reference	-
Yes	0.78 (0.64-0.94)	0.008	0.96 (0.80-1.17)	0.711
BMI category				
18.5-22.9	Reference	-	Reference	-
<18.5	1.27 (1.19-1.36)	<0.001	1.19 (1.11-1.27)	<0.001
23-24.9	0.93 (0.86-1.01)	0.068	0.97 (0.89-1.04)	0.389
25-29.9	0.99 (0.92-1.06)	0.764	1.04 (0.97-1.12)	0.280
≥30	1.12 (1.01-1.24)	0.035	1.15 (1.03-1.28)	0.010
Physical activity				
Everyday	Reference	-	Reference	-
More than once/week	1.03 (0.92-1.15)	0.652	0.99 (0.89-1.11)	0.920
Once/week	1.17 (1.01-1.34)	0.033	1.11 (0.96-1.28)	0.163
1-3 times/month	1.17 (1.03-1.32)	0.016	1.10 (0.96-1.24)	0.157
Never	1.33 (1.25-1.41)	<0.001	1.17 (1.09-1.26)	<0.001
Tobacco abuse				
No	Reference	-	Reference	-
Yes	1.07 (1.01-1.12)	0.015	1.12 (1.06-1.19)	<0.001
Alcohol abuse				
No	Reference	-	Reference	-
Yes	0.96 (0.90-1.02)	0.202	-	-

Adjusted (if individual univariate $P < 0.20$) for occupation requirement, type of employer, age, gender, education, residence, MPCE quintile, health insurance, occupation, BMI category, physical activity and tobacco abuse. Classification accuracy=88.31%. Pseudo $R^2=0.0214$

The prevalence of sleep disorders among the elderly is reported to be between 20% and 40% in literature because of many socio-cultural factors and underlying multi-morbidities among them.^[23-27] The sleep disorders among this study population were significantly higher among the >60-yr age group (13.45%). Despite varying sleep habits, culture and climatic conditions across the country and many international variations, the broad overlap of prevalence rates with research from other Asian countries and even western nations such as Europe and North America suggests the presence of cultural universality of insomnia among the elderly population to be higher.^[28]

The prevalence of sleep disorders among the rural and the illiterates was found to be high among the study population indicating the need for proper sleep habits among these groups.

Smoking was found to be a significant risk factor for development of sleep disorders among the rural illiterate population (12.35% and 12.80%, respectively). According to literature, both smoking and drinking were found to be risk factors for insomnia, but alcohol consumption was not associated with sleep disorders

in this analysis.^[29,30] Poor sleep hygiene as evinced by an affinity of smoking close to bedtime might be the reason for sleep disorders such as sleep initiation and further sleep maintenance among the study population.^[31] We hypothesize that rather liberal consideration of definition of alcohol intake or the population representative samples might have varied patterns of addictions, which have not been reported by the participants might be the cause of discrepancies in our findings in relation to the association of alcohol in sleep disorders.

Many previous studies from Asian countries have shown that marriage is associated with an increased risk of developing daytime sleepiness.^[32-34] Our analysis showed that the population who reported themselves to be widowed, separated or divorced had a higher risk of developing sleep disorders of some form be it sleep quality, duration or hygiene, the details of which need more exploration.

Positive association of physical activity over sleep hygiene and quality was reported in literature.^[35-37] This analysis re-emphasized the importance of physical activity on sleep by showing that there

is a higher risk of development of one or the other form of sleep disorder among those who were physically inactive (12.67%).

If Indian population continues to maintain an irregular sleep schedule, reports of disrupted sleep point to a bleak future for the nation. As already stated in the literature, 72% of Indians wake up one to three times a night, and 87% believe that their health is negatively impacted by sleep deprivation. Although 38% of Indians have seen a colleague falling asleep at work, 58% of them feel that their productivity suffers as a result of insufficient sleep.^[38,39]

Conclusion

Sleep disorders are globally prevalent but underdiagnosed problems and frequent in primary care patients in India, which has multiple negative health correlates. This analysis reiterates the need for generation of awareness about the importance and role of sleep hygiene, its quality, determinants and the long-term adverse effects of inadequate sleep among the general population. There is an emerging need for prompt detection and early management of insomnia and other sleep disorders, which warrant the reduction of chronic psychiatric disorders and other multi-morbidities among the ageing population of India. Targeted screening of high-risk groups, i.e. people who are unemployed, living with psychiatric or other multi-morbidity and other factors discussed above may be considered for this. This can be coupled with provision of accessible and affordable screening tools for early diagnosis at the primary care level and/or proper referral services to higher centres for adequate management and follow-up services.

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Conflicts of interest

There are no conflicts of interest.

References

1. International Institute for Population Sciences (IIPS) NP for, Health Care of Elderly (NPHCE), MoHFW HTHCS of, (USC) PH (HSPH) and the U of SC. Longitudinal Ageing Study in India (LASI) wave 1, 2017/18, India report. 2020. https://www.iipsindia.ac.in/sites/default/files/LASI_India_Report_2020_compressed.pdf. [Internet]. [cited 2023 Oct 4].
2. World Health Organization. WHO cardiovascular disease risk non-laboratory-based charts: South Asia- Bangladesh, Bhutan, India, Nepal, Pakistan [Internet]. 2019; Available from: https://cdn.who.int/media/docs/default-source/cardiovascular-diseases/south-asia.pdf?sfvrsn=c5b0d9a3_2 [Internet]. [cited 2023 Oct 9].
3. Jenkins CD, Stanton BA, Niemcryk SJ, Rose RM. A scale for the estimation of sleep problems in clinical research. *J Clin Epidemiol* 1988;41:313-21.
4. Pengpid S, Peltzer K. Prevalence and associated factors of dizziness among a national community-dwelling sample of older adults in India in 2017-2018. *Makara J Health Res* 2021;25:180-7.
5. Pengpid S, Peltzer K. Associations of loneliness with poor physical health, poor mental health and health risk behaviours among a nationally representative community dwelling sample of middle-aged and older adults in India. *Int J Geriatr Psychiatry* 2021;36:1722-31.
6. Cho E, Chen TY. The bidirectional relationships between effort-reward imbalance and sleep problems among older workers. *Sleep Health* 2020;6:299-305.
7. Fabbri M, Beracci A, Martoni M, Meneo D, Tonetti L, Natale V. Measuring subjective sleep quality: A review. *Int J Environ Res Public Health* 2021;18:1082.
8. Jehan S, Masters-Isarilov A, Salifu I, Zizi F, Jean-Louis G, Pandi-Perumal SR, *et al.* Sleep disorders in postmenopausal women. *J Sleep Disord Ther* 2015;4:212.
9. Tamanna S, Geraci SA. Major sleep disorders among women: (Women's Health Series). *South Med J* 2013;106:470-8.
10. Salari N, Hasheminezhad R, Hosseini-Far A, Rasoulpoor S, Assefi M, Nankali S, *et al.* Global prevalence of sleep disorders during menopause: A meta-analysis. *Sleep Breath* 2023;27:1883-97.
11. Xiang YT, Ma X, Cai ZJ, Li SR, Xiang YQ, Guo HL, *et al.* The prevalence of insomnia, its sociodemographic and clinical correlates, and treatment in rural and urban regions of Beijing, China: A general population-based survey. *Sleep* 2008;31:1655-62.
12. Doi Y, Minowa M, Okawa M, Uchiyama M. Prevalence of sleep disturbance and hypnotic medication use in relation to sociodemographic factors in the general Japanese adult population. *J Epidemiol* 2000;10:79-86.
13. Weller SA. Financial stress and the long-term outcomes of job loss. *Work Employ Soc* 2012;26:10-25.
14. McKee-Ryan F, Song Z, Wanberg CR, Kinicki AJ. Psychological and physical well-being during unemployment: A meta-analytic study. *J Appl Psychol* 2005;90:53-76.
15. Haynes PL, Wolf RL, Howe GW, Kelly MR. Unemployed individuals reporting hindrance work stress at previous job have increased likelihood of insomnia disorder. *Int J Behav Med* 2021;28:39-47.
16. Blay SL, Andreoli SB, Gastal FL. Prevalence of self-reported sleep disturbance among older adults and the association of disturbed sleep with service demand and medical conditions. *Int Psychogeriatr* 2008;20:582-95.
17. Ohayon MM. Epidemiology of insomnia: What we know and what we still need to learn. *Sleep Med Rev* 2002;6:97-111.
18. Brewster GS, Riegel B, Gehrman PR. Insomnia in the older adult. *Sleep Med Clin* 2018;13:13-9.
19. Desjardins S, Leblanc MF, Desgagné A. Sleep problems in anxious and depressive older adults. *Psychol Res Behav Manag* 2015;8:161-9.
20. Vitiello MV. Sleep in normal aging. *Sleep Med Clin* 2012;7:539-44.
21. Antillón M, Lauderdale DS, Mullahy J. Sleep behavior and unemployment conditions. *Econ Hum Biol* 2014;14:22-32.
22. Amiri S, Behnezhad S. Smoking and risk of sleep-related issues: A systematic review and meta-analysis of prospective

- studies. *Can J Public Health* 2020;111:775–86.
23. Li H, Liu Y, Xing L, Yang X, Xu J, Ren Q, *et al.* Association of cigarette smoking with sleep disturbance and neurotransmitters in cerebrospinal fluid. *Nat Sci Sleep* 2020;12:801–8.
24. Dahale AB, Jaisoorya TS, Manoj L, Kumar GS, Gokul GR, Radhakrishnan R, *et al.* Insomnia among elderly primary care patients in India. *Prim Care Companion CNS Disord* 2020;22:19m02581.
25. Foley DJ, Monjan AA, Brown SL, Simonsick EM, Wallace RB, Blazer DG. Sleep complaints among elderly persons: An epidemiologic study of three communities. *Sleep* 1995;18:425–32.
26. Maggi S, Langlois JA, Minicuci N, Grigoletto F, Pavan M, Foley DJ, *et al.* Sleep complaints in community-dwelling older persons: Prevalence, associated factors, and reported causes. *J Am Geriatr Soc* 1998;46:161–8.
27. Liu X, Liu L. Sleep habits and insomnia in a sample of elderly persons in China. *Sleep* 2005;28:1579–87.
28. Sandooja C, Panda M, Kumar V, Kishore J. Sleep quality index among the elderly population in selected areas of Delhi: A community-based cross-sectional study. *Int J Community Med Public Health* 2023;10:1537–42.
29. Ohayon MM, Zulley J, Guilleminault C, Smirne S, Priest RG. How age and daytime activities are related to insomnia in the general population: Consequences for older people. *J Am Geriatr Soc* 2001;49:360–6.
30. Kaneita Y, Ohida T, Osaki Y, Tanihata T, Minowa M, Suzuki K, *et al.* Insomnia among Japanese adolescents: A nationwide representative survey. *Sleep* 2006;29:1543–50.
31. Jefferson CD, Drake CL, Scofield HM, Myers E, McClure T, Roehrs T, *et al.* Sleep hygiene practices in a population-based sample of insomniacs. *Sleep* 2005;28:611–5.
32. Booker LA, Magee M, Rajaratnam SMW, Sletten TL, Howard ME. Individual vulnerability to insomnia, excessive sleepiness and shift work disorder amongst healthcare shift workers. A systematic review. *Sleep Med Rev* 2018;41:220–3.
33. DemiR G. Daytime sleepiness and related factors in nursing students. *Nurse Educ Today* 2017;59:21–5.
34. Hiyoshi A, Fall K, Netuveli G, Montgomery S. Remarriage after divorce and depression risk. *Soc Sci Med* 2015;141:109–14.
35. Xie Y, Liu S, Chen XJ, Yu HH, Yang Y, Wang W. Effects of exercise on sleep quality and insomnia in adults: A systematic review and meta-analysis of randomized controlled trials. *Front Psychiatry* 2021;12:664499.
36. Inoue S, Yorifuji T, Sugiyama M, Ohta T, Ishikawa-Takata K, Doi H. Does habitual physical activity prevent insomnia? A cross-sectional and longitudinal study of elderly Japanese. *J Aging Phys Act* 2013;21:119–39.
37. Dubinina E, Korostovtseva LS, Rotar O, Amelina V, Boyarinova M, Bochkarev M, *et al.* Physical activity is associated with sleep quality: Results of the ESSE-RF epidemiological study. *Front Psychol* 2021;12:705212.
38. The Times of India. Why you feel Sleepy at work? 2016. Available from: <http://timesofindia.indiatimes.com/life-style/health-fitness/health-news/Why-you-feel-sleepy-at-work/articleshow/34249762.cms>. [Last accessed on 2016 Oct 28].
39. Halder P, Das S, Mamgai A, Nongkynrih B, Bisoi S, Chattopadhyay A, *et al.* Association of sleep disorders with non-lab-based CVD risk score among Indian population aged above 45 years: insight from Longitudinal Aging Study in India. *International Journal of Community Medicine and Public Health* 2024;11:311321.