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Original Research Article

Prevalence of insomnia and its association with comorbid conditions among elderly attending an urban health training centre in Nagpur, Maharashtra: a cross-sectional study

Anjali V.*, Sonali Patil, Uday W. Narlawar, Balamurugan S.

Department of Community Medicine, GMC Nagpur, Maharashtra, India

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***Correspondence:**
Anjali V.,
E-mail: anjalivamadeva27@gmail.com

ABSTRACT

Background: Insomnia is characterised by dissatisfaction with the quality or quantity of sleep, accompanied by difficulty in falling asleep or maintaining sleep which is common among elderly due to age-related physiological changes and chronic medical conditions. Despite its high prevalence insomnia is under-recognised, under-diagnosed and inadequately treated among elderly population. Therefore, this study aims to estimate the prevalence of insomnia among the elderly and to assess its associated co morbid conditions.
Methods: A hospital based cross-sectional study was conducted among 251 elderly individuals (aged ≥60 years) at the Urban health training centre of a tertiary care centre in Nagpur, Maharashtra. Socio-demographic and clinical information were gathered using a pre-designed and pre-tested questionnaire. The severity of insomnia was assessed using the Insomnia Severity Index (ISI). Data analysis was performed with Jamovi version 2.3.28, employing descriptive statistics as well as Chi-square and Fisher's exact tests.
Results: The mean age of the participants was 68.9±6.29 years and the prevalence of insomnia was 59.2%. A significant association was observed between insomnia and factors such as age, family type and medical conditions like diabetes and musculoskeletal disorders, cardiovascular disease and genitourinary problems.
Conclusions: More than half of the elderly individuals in the study were affected by insomnia. Several socio-demographic and co morbid conditions were associated with insomnia, underscoring the importance of early identification and routine screening for sleep disturbances in elderly. Such measures may contribute to improving their overall health and quality of life.

Keywords: Comorbid conditions, Cross-sectional study, Elderly, India, Insomnia, Prevalence, Urban

INTRODUCTION

Ageing population has become a significant transition worldwide. The proportion of older adults is increasing rapidly, with the global population aged 60 years and above expected to rise approximately 13.4% in 2020 to over 21% by 2050.[1,2] In India, an elderly person is defined as an individual aged 60 years or older.[3] Major improvements in healthcare, nutrition and living conditions have contributed to increased life expectancy resulting in a growing elderly population. This demographic shift has brought the other side of spectrum also in play with age related health problems becoming an important public health concern. Sleep is an essential physiological process which plays a vital role in maintaining physical health, emotional stability and cognitive function. Adequate sleep supports proper metabolic regulation, immune function and neurological process. Consequently, disturbances in sleep can negatively impact overall health and quality of life.[4,5] However, aging is associated with several physiological changes in sleep architecture, including reduced deep

sleep, frequent nighttime awakenings and uneven sleep and wake times. These changes make elderly individuals more susceptible to sleep disturbances. Among various sleep disorders, insomnia is one of the most commonly reported issues among older adults. The International Classification of Sleep Disorder, defines insomnia as a complaint of difficulty initiating sleep, difficulty initiating sleep or waking up too early or sleep that is chronically non restorative or poor in quality.[6] Persistent insomnia can result in fatigue, irritability, reduced concentration, mood disturbances and a decreased quality of life in elderly individuals.[4]

Chronic medical illnesses such as Diabetes mellitus, Hypertension, Cardiovascular diseases, Musculoskeletal disorders and genitourinary problems are commonly observed in older adults which interfere with normal sleep patterns. Pain, nocturnal symptoms, medication side effects and psychological stress associated with these conditions may disrupt sleep and exacerbate insomnia symptoms.[7,8] In addition to the conditions above, sociodemographic factors also influence sleep quality among elderly individuals. Studies have shown that increasing age, gender differences and marital status may affect sleep patterns in older adults.[9,10] Despite the high prevalence and potential health consequences, insomnia often remains under-diagnosed and under-treated in routine clinical practice. Many elderly individuals perceive sleep disturbances as a normal part of aging and may not seek medical attention.

Considering the growing elderly population and increasing burden of chronic diseases, understanding the insomnia and its association with comorbid conditions is crucial for enhancing geriatric healthcare services. Early identification of sleep disturbances can enable healthcare providers to implement appropriate interventions, thereby improving the overall well-being of elderly individuals. Although studies have examined insomnia among elderly populations in various regions of India, there is limited evidence from central India. Understanding the burden and associated factors of insomnia in this setting is essential for improving geriatric health services. Therefore, the present study was conducted to estimate the prevalence of insomnia and assess its association with selected comorbid conditions among elderly attending the Urban Health Training Centre of a tertiary care hospital in Nagpur, Maharashtra.

METHODS

A hospital -based cross sectional study was conducted among elderly individuals attending the Urban health Training centre of a tertiary care hospital in Nagpur, Maharashtra. The study was done for a period of 3 months from September to November 2024. The study population included elderly people aged more than 60 years who visited the Urban Health Training Centre during the study period. Individuals who were unable to respond due to cognitive impairment, severe sensory deficits or severe illness were excluded from the study.

Based on a previous study reporting an insomnia prevalence of 53.34% among the elderly, the sample size was calculated using the formula Z^2pq/d^2 with a 95% confidence interval and a 7% allowable error. The calculated sample size was 195, however a total of 251 elderly individuals were included in the study.[13]

After obtaining approval from Institutional Ethics Committee, data collection was started. Eligible elderly individuals attending the outpatient department of the Urban health training centre were recruited using convenience sampling. All eligible participants who consented to participate were included, resulting in a final sample size of 251 elderly individuals. The study objectives were explained to participants and confidentiality of information was strictly maintained. Data were collected using a pre-designed, pre-tested structured questionnaire. Information on socio-demographic characteristics and comorbid conditions like diabetes, hypertension, cardiovascular disease, musculoskeletal disorders, genitourinary problems, dental issues and vision problems were obtained through interview and available medical records.

Severity of insomnia was assessed using Insomnia Severity Index (ISI) in the study population. Sleep problems experienced during the previous two weeks can be assessed subjectively using this scale. It consists of 7 items including the following domains difficulty in initiating sleep, difficulty in maintaining sleep, early morning awakening, satisfaction with sleep quality, interference of sleep problems with daily functioning, noticeability of sleep difficulties by others and level of distress caused by the sleep problem. Each item is scored on a five-point Likert scale ranging from 0 (none) to 4 (very severe).[11] The total ISI score is calculated by summing the responses to all seven items with possible scores ranging from 0 to 28. The scores are interpreted as follows: 0-7 indicates no clinically significant insomnia, 8-14 represents subthreshold insomnia, 15-21 denotes clinical insomnia (moderate severity) and 22-28 reflects clinical insomnia (severe).

Statistical analysis

Data were entered in MS Excel and statistical analysis was done using Jamovi 2.3.28. Descriptive statistics were used to summarize the data. Chi square test and Fishers exact tests were applied for test of significance and a p value <0.05 was considered statistically significant.

RESULTS

A total of 251 elderly individuals participated in the study. The mean age of the participants was 68.7±6.29 years, with range of 60 to 85 years. Majority of participants belonged to the age group of 60 to 70 years,

followed by those aged 71 to 80 years. while a smaller proportion were above 80 years old. Females comprised 51.4% of the participants, slightly more than males at 48.6%. Regarding marital status, 86.9% participants were married, 11.1% were widowed/widower and a small proportion were unmarried. Majority were identified as Hindu (84.9%), followed by Buddhists (14.3%) with a small percentage being Muslim (0.8%). Regarding family structure, most elderly individuals were living in joint families (66.9%), followed by nuclear families (23.9%). A smaller proportion belonged to three generation families (6.8%), while 2.45% lived alone. Socioeconomic status assessed using the Modified Kuppuswamy scale 2025 showed that a major share of participants belonged to the lower middle socioeconomic class (44.2%) followed by the upper class (33.2%), middle class (28.7%), upper middle class (23.1%) and lower class (3.2%) (Figure 1 and Table 1).

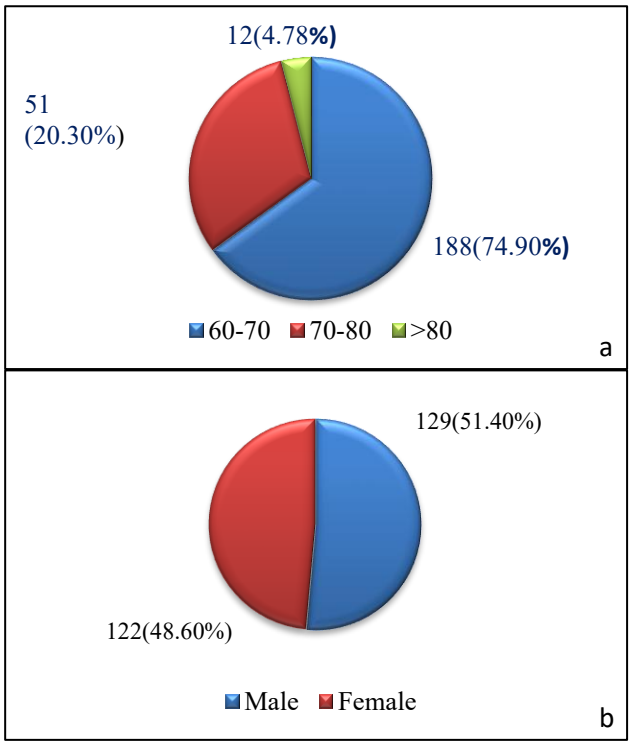

Figure 1 (a, b): Distribution of study participants according to age and sex (n=251).

Insomnia assessed using Insomnia severity Index (ISI) revealed that 59.4% of the participants experienced some degree of insomnia, while 40.6% had normal sleep patterns. Among those with insomnia, majority had subthreshold insomnia (49.8%), indicating mild sleep disturbances that may not yet meet the criteria for clinical insomnia. In addition, 7.2% of participants had moderate clinical insomnia and 2.4% had severe insomnia suggesting that a smaller proportion of participants were experiencing more serious sleep problems (Table 2).

The association between insomnia and various socio-demographic and clinical factors was further examined. A statistically significant association was observed between age and insomnia ($p<0.001$). Type of family was also significantly associated with insomnia ($p=0.001$) suggesting that living arrangements and family support may influence sleep patterns among elderly individuals. With respect to comorbid conditions, several medical illnesses showed a significant association with insomnia.

Elderly individuals suffering from diabetes mellitus were more likely to experience insomnia compared to those without Diabetes ($p<0.001$). Similarly, musculoskeletal disorders were significantly associated with insomnia ($p=0.003$), possibly due to chronic pain and discomfort affecting sleep quality. Cardiovascular diseases ($p=0.039$) and genitourinary problems ($p=0.012$) were also found to have significant associations with insomnia, suggesting that these conditions may contribute to disturbed sleep through nocturnal symptoms or other related factors (Table 3).

However, some variables did not show a significant association with insomnia in the study. These included sex ($p=0.152$), socioeconomic status ($p=0.237$), hypertension ($p=0.784$), dental problems ($p=0.792$) and vision problems ($p=0.940$). Although these factors were present among the participants, they were not significantly related to the occurrence of insomnia in the present study. Overall, the findings of the study suggest that insomnia is relatively common among elderly individuals attending the urban health training centre and it appears to be associated with certain socio-demographic factors and specific chronic medical conditions.

Table 1: Distribution of study subjects according to sociodemographic characteristics (n=251).

Variables		Frequency	%
Marital status	Married	218	86.90
	Unmarried	5	2.0
	Widow/widower	28	11.10
Religion	Hindu	213	84.90
	Buddhist	36	14.30
	Muslim	2	0.80
Type of family	Nuclear	60	23.90
	Joint	168	66.90
	Three generation	17	6.80

Continued.

Variables		Frequency	%
	Single	6	2.40
Socioeconomic Status*	Upper	8	3.20
	Upper middle	58	23.10
	Middle class	72	28.70
	Lower middle	111	44.20
	Lower	8	3.20

*Modified Kuppuswamy scale 2025.

Table 2: Distribution of study subjects according to insomnia severity index (ISI).

Variable		N (251)	%
Normal (0-7)		102	40.6
Some degree of insomnia (8-28)	Sub threshold (8-14)	125	49.8
	Moderate severity (15-21)	18	7.2
	Severe clinical insomnia (22-28)	6	2.4

Table 3: Association between insomnia and selected sociodemographic factors and comorbid conditions among study participants.

Variables		Insomnia severity index scores		n=251 (%)	Chi square Df P value
		Normal (0-7)	Insomnia (8-28)		
Age					
60-70		58 (30.80%)	130 (69.10%)	188	0.00001*
71-80		40 (78.43%)	11 (21.56%)	51	
>80		4 (33.33%)	8 (66.66%)	12	
Sex					
Male		58 (45.0%)	71 (55.0%)	122	2.06**
Female		44 (36.10%)	78 (63.90%)	129	10.152
Type of family					
Nuclear		28 (46.70%)	32 (53.30%)	60	0.001*
Joint		61 (36.30)	107 (63.70%)	168	
Three generation		13 (76.50%)	4 (23.50%)	17	
Single		0 (0.0%)	6 (100.0%)	6	
Socioeconomic class					
Upper		0 (0.0%)	2 (100.0%)	2	0.237*
Upper middle		30 (51.70%)	28 (48.30%)	58	
Middle		26 (36.10%)	46 (63.90%)	72	
Lower middle		44 (39.60%)	67 (60.40%)	111	
Lower		2 (25.0%)	6 (75.0%)	8	
Co morbid conditions					
Diabetes	Yes	17 (22.70%)	58 (77.30%)	75	<0.001
	No	85 (48.30%)	91 (51.70%)	176	
Hypertension	Yes	67 (41.4%)	95 (58.6%)	162	0.784
	No	35 (39.3%)	54 (60.7%)	89	
Musculoskeletal disorders	Yes	78 (37.70%)	129 (62.30%)	207	0.03
	No	24 (54.50%)	20 (45.50%)	44	
Cardiovascular disease	Yes	6 (22.2%)	21 (77.8%)	224	0.039
	No	96 (42.9%)	128 (57.1%)	27	
Genitourinary problem	Yes	2 (11.8%)	15 (88.2%)	17	0.012
	No	100 (42.7%)	134 (57.3%)	234	
Dental problem	Yes	6 (37.5%)	10 (62.55)	16	0.792
	No	96 (40.9%)	139 (59.1)	235	
Vision problem	Yes	12 (40.0%)	18 (60.0%)	30	0.940
	No	90 (40.7%)	131 (59.3%)	221	

Chi square test**, Fishers exact test*.

DISCUSSION

The present study evaluated the presence of insomnia and its association with comorbid conditions and sociodemographic characteristics among elderly individuals attending the out patient department of urban health training centre. The results indicate that majority (59.2%) had some form of insomnia, indicating that sleep disruptions continue to be significant but frequently disregarded health issue among the elderly. The existence of several chronic conditions among the elderly population visiting health care institutions, which are known to affect sleep quality may be reason for the relatively high prevalence found in this study.

Similar findings have been reported on several studies conducted among elderly. A study conducted by Varghese et al in Bengaluru, among elderly participants revealed a prevalence of 64.8% among elderly participants attending Urban health centres.[14] A study conducted by Panda et al from Delhi using the Insomnia Severity Index reported that about half(47.8%) of the elderly participants experienced some degree of insomnia in urban area.[15] A cross-sectional study carried out by Sanjay et al in an urban poor locality of Bengaluru documented an insomnia prevalence of 49%.[16] Similarly, Dahale et al, reported a prevalence of 42.2% in Kerala, while Bhat et al observed that 53.33% of their participants experienced insomnia.[13,17] Conversely, a few studies documented comparatively lower prevalence rates. A study conducted by Zhong et al in Wuhan China among the primary care attenders revealed insomnia prevalence of 28.9%. Sakamoto et al reported a prevalence of 15.2% among elderly residents of Ladakh using Insomnia Severity Index.[19]

In this study, age was found to be associated with insomnia, more commonly observed among participants in the 60-70 years age group compared to those ages>70 years. Age related physiological changes such as alterations in circadian rhythm, reduced sleep efficiency and increased nighttime awakenings have been reported to predispose elderly individuals to insomnia. A cross-sectional study conducted by Ahmad et al among elderly patients attending NIUM hospital Bangalore observed that the prevalence of insomnia increased from 72.4% to 84.8% as age increased above 60 years.[20] The study found a novel significant association between type of family and insomnia, which could be due to differences in caregiving support, sleep hygiene practices, perceived security.

Comorbid conditions were also observed to have an association with insomnia in this study. Chronic medical conditions such as Diabetes, cardiovascular diseases, musculoskeletal disorders, genitourinary problems are known to interfere with normal sleep patterns due to pain, discomfort or medication effects .Similar findings were observed in a study conducted by Varghese et al where co morbid conditions, participants with urinary symptoms had higher likelihood of insomnia.[14] In the study conducted by Panda et al in Delhi ,insomnia was significantly associated with comorbidities like Diabetes and Hypertension but presence of cardiovascular diseases was not associated.[15] Bhat et al in his study conducted in Jammu and Kashmir, revealed that insomnia is associated with comorbid conditions like cardiovascular diseases and Diabetes.[13] Another study conducted by Ba-Liang Zhong et al, in Wuhan China among the primary care attenders revealed that insomnia is associated with cardiovascular disease.[18]

Overall, the findings of the present study are consistent with the existing literature indicating that insomnia among the elderly is influenced by a combination of demographic factors and chronic medical conditions. Considering its impact on daily functioning and quality of life, early recognition and management of insomnia should form an important part of geriatric healthcare services.

Limitations

The study was hospital based, so the findings may not be generalizable to the general elderly population. The cross-sectional design limits the ability to establish causal relationships. Data were based on self-reported responses, which may introduce recall or reporting bias.

CONCLUSION

The findings of the present study indicate that insomnia is fairly common among elderly individuals attending the urban health centre. A notable proportion of the participants were found to experience different degrees of insomnia, suggesting that sleep disturbances are an important concern in this age group. It was also observed that insomnia was associated with certain sociodemographic factors like age, type of family and presence of comorbid conditions like Diabetes, Cardiovascular disease, musculoskeletal and genitourinary problem highlighting that sleep problems in older adults are often influenced by multiple factors. These findings highlight that insomnia in the elderly is often closely linked with their overall health status and the burden of comorbid conditions. Therefore, greater attention should be given to sleep related complaints while managing elderly patients with chronic conditions. Early identification of insomnia and appropriate management may help improve their overall well-being, daily functioning and quality of life.

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