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Synthesizing the risk of morbidities and lifestyle factors on insomnia symptoms among middle-aged and older adult persons in India

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Abstract

Purpose Most of the time increasing age and improper lifestyle enhance the burgeoning health challenge for middle-aged and older adult persons. In this way, the present study seeks to know the association of morbidity, lifestyle parameters, and background characteristics with insomnia symptoms among middle-aged and older adults in India.

Methods The study utilizes a sample of 46,462 older individuals aged 45 years and above from LASI wave-1. Multivariate binary logistic models were applied to acquire the results.

Result Insomnia symptom was closely linked with hypertension [AOR: 1.33; 1.27–1.39], heart diseases [AOR: 1.37; 1.23–1.53], the neurological problem [AOR: 1.67; 1.46–1.91], as compared to older adults who did not suffer from any morbidity. The likelihood of insomnia symptoms was also higher among older individuals who reported following an accustomed lifestyle i.e., no reading habit [AOR: 1.35; 1.26–1.45], never going to the park for relaxing leisure hours [AOR: 1.38; 1.01–1.73]. Moreover, insomnia increases with age, and among elder women.

Conclusion The encouragement of remedies for morbidity and improper lifestyle practices could be considered as part of a plan to decrease insomnia symptoms. As well as the detection of early stages of insomnia by health professionals and intervention of public health services is necessary.

Keywords Insomnia, Morbidity, Improper lifestyle, Older adults, India

Background

Insomnia symptom is commonly found when a person faces a complex situation like waking up during the night, waking up too early, and having trouble falling asleep (Hayley et al. 2014). Under these circumstances, people are unable to fulfil the adequacy or quality of sleep. thus,

it obstructs maintaining memory and focus which leads to disturbed work efficiency during the day, well-being, and productivity (Abad & Guilleminault 2018; Hillman et al. 2018; Prince et al. 2015). Across the globe, insomnia has a noteworthy knock on the elderly population (Ancoli-Israel & Ayalon 2006; Asplund 1999). Due to pre-existing physical ailments as well as mental health disturbance, older adults experience sleep disorders repeatedly (Muhammad et al. 2022).

Currently, India is in the position of the demographic stir that introduces the growth of the elderly population (Prakash 2003). However the span of life grows a significant challenge to the quality of living of the older

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individual (Sanderson & Scherbov 2005; Suzman et al. 2015). In this way, poor health outcomes alter their standard of living when they experience several chronic diseases (Joshi et al. 2003). Thus, multiple research highlights the thread between insomnia and morbidities alongside an individual's socio-economic characteristics and alteration of lifestyle (Ancoli-Israel & Ayalon 2006; Bonnet & Arand 1989; Foley et al. 2004). A study by ICMR (Indian Council of Medical Research) emphasized that older individuals in India suffer from chronic illnesses (Shah & Prabhakar 1997). In this aspect, some pieces of paper reveal that persistent diseases such as heart diseases, neurological disorders like Parkinson's disease, bone/joint-related diseases like osteoporosis and arthritis, lungs related diseases like asthma, and hypertension warily hit welfare and health among older adults (Brett et al. 2012; Henchoz et al. 2019; Martinez-Martin et al. 2012; Yamada et al. 2015). These diseases are revealed as independent risk factors for insomnia prevalence among middle-aged and older adults in India (Martikainen et al. 2003; Mc Carthy 2021). Age plays a pivotal role in determining the insomnia. Sex differences are also often viewed in older adults regarding insomnia symptoms (Jaussent et al. 2011). Besides this, marital status, and working involvement are major predisposing factors for growing insomnia symptoms (Kawata et al. 2020). Some quantitative evidence also revealed that insomnia is associated with detrimental lifestyle factors like smoked/smokeless tobacco and alcohol consumption, and not spending beneficial leisure hours (Hartz et al. 2007; Sun et al. 2013).

In the case of India, different studies show insomnia pervasiveness. A rural-based study conducted in North India conveys that 23.7% of older individuals reported insomnia (Tiwari et al. 2013) whereas a study in South India (Panda et al. 2012) manifests that 18.6% of older adults have difficulties in sleep. Another study of West Bengal and Kerala reveals that 15% and 22% of older adults have persistent insomnia symptoms respectively (Muhammad et al. 2022).

To develop an effective plan of action for the prevention and treatment of insomnia among middle-aged and older adults, it is crucial to have a more detailed understanding of insomnia risk factors that are relevant to this population's age group. Very few studies emphasized middle-aged as well as older adults, especially in India. Hence, the present study emphasized establishing the association between carrying with several morbidity conditions with insomnia among middle-aged and Indian older adults. The study also appraises whether insomnia is regulated by individual background and lifestyle characteristics. The current study may be helpful for policymakers to introduce effective health services, especially for middle-aged and older adults who are at the highest possibility of morbidity and the most vulnerable groups for insomnia symptoms.

Methods
Data
Our research applied the data that was obtained from LASI wave-1, 2017–2018. LASI is a comprehensive nationwide study of aging that includes all states and union territories of India. It includes 72,250 individuals who are 45 years or older regardless of their spouse's age. This dataset provides information about chronic health, mental health, and their outcomes. As well as it gives information about various health insurance, retirement, welfare programs work and employment status, family, and social networks, etc. This survey follows a multiple clustering survey design and adopts a four-stage sampling design for urban areas and a three-stage sample design for rural areas in each state.

Ethical approval and guidelines of this survey were confirmed by ICMR, Delhi, and IIPS, Mumbai. However, to access the detailed study method and data of LASI, anyone can visit https://www.iipsindia.ac.in/lasi/. The core of the current study was on individuals who were 45 years of age or above. After excluding incomplete information on insomnia symptoms (trouble falling asleep, waking up during the night, and waking up too early) a total sample of 46,462 was taken (including 28,492 males and 17,970 females).

Variable description
Outcome variables
The outcome variable of the current study is the respondent's (aged 45 years and above) symptoms of insomnia. At the time of collecting LASI data regarding trouble falling asleep, awakening during the night, and waking up too soon in the morning the interviewer asked how many nights/week respondents faced sleeping problems. All the answers were gathered into four groups: a) Never b) 1–2 nights/week c) 3–4 nights/week d) 5 or more nights/week. The previous studies included the same criteria to find out the insomnia symptoms among older adults (Lallukka et al. 2016; Morin et al. 2011; Zailinawati et al. 2012). To fulfil the objectives, the current study categorized insomnia symptoms based on three sleep disorders into odd as "Yes" for ≥ 3 nights/week and never experienced any kind of sleep disorders as "No" or non-odds.

Explanatory variables
Health ailment or morbidity factors: This current study included five health ailments or morbidity factors as predictors for insomnia. The question assessed whether 'ever had hypertension, heart diseases, 'neurological problems,

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lung diseases, and bone/joint related diseases (Foley et al. 2004). The answer to these questions was recoded as "yes" and "no".

In lifestyle factors, the reading habit of books/magazines, watching television/listening to music, and going to a park or beach to spend leisure hours were recoded as daily, sometimes, and never. Alcohol consumption behaviour was recoded as 'yes' and 'no'.

In background characteristics, age, sex, residence, marital status, self-rated health, and working status were included (Joshi et al. 2003; Mildestvedt et al. 2018; Muhammad et al. 2022). Age (Zhang et al. 2019) groups are recoded as 45–59 years (older adults), 60–74 (elderly) years, and 74 years and above (oldest-old). Sex was recoded as 'male and female'. Marital status was recoded as currently in union (married) and currently not in union "included widowed, divorced, separated, deserted and never married". Self-rated health indicates undiagnosed diseases and it was recoded as good (very good and good), fair (moderate), and poor (poor and very poor). Working status was recoded as 'yes and no'. Table 1 includes all of the chosen categorical variables and their corresponding codes.

Statistical analysis

Both descriptive statistics and percentage distribution were used to calculate the prevalence of insomnia symptoms across the explanatory variables. The Chi-square test of association was applied to assess the association and level of significance between the outcome variable and each explanatory variable. The final regression model only incorporated those variables that exhibited significant association in Chi-square test statistics. To explore further associations between insomnia symptoms and the explanatory variables, a binary logistic regression model (Fernández-Niño et al. 2018) was conducted using STATA version 17.0. The results of this study were based solely on the adjusted model, which controlled for all the explanatory variables simultaneously. The outcomes of the Binary logistic regression were reported in terms of Odds Ratio (OR) with 95% Confidence Intervals (CIs), while the statistical significance levels were denoted by *P*-values. The **'logistic'** command with the ending **'ib'** base (defined) was utilized to perform the likelihood ratio analysis. The formula can be expressed as follows.

$$Log\left[\frac{\pi}{1-\pi}\right] = \beta_0 X_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \ldots \beta_n X_n + \varepsilon$$

Where $\beta_{0\ldots\ldots}\beta_n$ is the regression coefficient which measures the relative outcome of certain explanatory factors on insomnia symptoms and ε defines the unexplained variation in the model. The result was presented through an adjusted odds ratio with a 95% confidence interval.

Model-1 is an unadjusted model (UOR) where all variables are measured with insomnia symptoms individually. Model 2 represents the adjusted model (AOR) with 95% CI (confidence interval) where all the health ailments, lifestyle factors, and background characteristics are controlled individually.

Results

Table 2: highlights the individual characteristics of the study population (N = 46,462). Nearly one-third of middle-aged and older adults suffer from insomnia symptoms (29.67%). One-fourth of the sample middle-aged and older adults bear hypertension (25.90%). About 3.44% and 2.07% of the study population suffered from chronic heart diseases and neurological problems respectively. There were 5.71% and 13.49% of older adults who reported having lung and bone/joint-related diseases.

About one-fourth (23.86%) and 44.24% of older adults consumed alcoholic beverages and tobacco respectively. An overwhelming majority of participants had no reading habit (67.32%) and did not go to a park or beach spending leisure hours (83.28%) whereas nearly 28.88% of respondents did not watch television or listen to music.

Table 1 Coding assigned for the categorical outcome and explanatory variables [N = 46,462]

Sl No.	Variables	Associated coding
1	*Insomnia symptom*	Never = 0; Yes = 1
2	*Hyper tension*	Yes = 1; No = 2
3	*Heart Diseases*	Yes = 1; No = 2
4	*Neurological Problem*	Yes = 1; No = 2
5	*Lungs Diseases*	Yes = 1; No = 2
6	*Bone/Joint diseases*	Yes = 1; No = 2
7	*Reading habits*	Daily = 1; Sometimes = 2; Never = 3
8	*Alcohol consumption*	Yes = 1; No = 2
9	*Watch television/listen to music*	Daily = 1; Sometimes = 2; Never = 3
10	*Tobacco consumption*	Yes = 1; No = 2
11	*Go to the park/beach to relax*	Daily = 1; Sometimes = 2; Never = 3
12	*Age*	45–59 = 1; 60–73 = 2; 74 + = 3
13	*Sex*	Male = 1; Female = 2
14	*Residence*	Rural = 1; Urban = 2
15	*Marital status*	Currently in union = 1; Currently not in union = 2
16	*Self-rated health*	Good = 1; Fair = 2 Poor = 3
17	*Working status*	Yes = 1; No = 2

Table 2 Health and socio-economic profile of the study population [*N* = 46,462]

Variables	Sample	Percentage
Health factors[a]		
Insomnia symptom		
Never	32,677	70.33
Yes	13,785	29.67
Hyper tension		
Yes	12,035	25.90
No	34,427	74.10
Heart Diseases		
Yes	1598	3.44
No	44,864	96.56
Neurological Problem		
Yes	963	2.07
No	45,499	97.93
Lungs Diseases		
Yes	2653	5.71
No	43,809	84.29
Bone/Joint diseases		
Yes	6267	13.49
No	40,195	86.51
Lifestyle factors		
Reading habits		
Daily	7381	15.89
Sometimes	7803	16.79
Never	31,278	67.32
Alcohol consumption		
Yes	11,084	23.86
Never	35,378	76.14
Watch television/listen to music		
Daily	21,685	46.67
Sometimes	11,357	24.44
Never	13,420	28.88
Tobacco consumption		
Yes	20,553	44.24
No	25,909	55.76
Go to a park or beach to relax		
Daily	907	1.95
Sometimes	6862	14.77
Never	38,693	83.28
Background factors		
Age		
45–59	24,480	52.69
60–74	17,515	37.7
74 +	4467	9.61
Sex		
Male	28,492	61.32
Female	17,970	38.68
Residence		
Rural	31,855	68.56
Urban	14,607	31.44

Table 2 (continued)

Variables	Sample	Percentage
Marital status		
Currently in union	36,123	77.75
Currently not in union	10,339	22.25
Self-rated health		
Good	20,132	43.33
Fair	18,880	40.64
Poor	7450	16.03
Working status		
Yes	29,720	63.97
No	16,742	36.03

[a] Self-reported by the participants

Most of them belonged to the 45–59 age group (52.69%) and used to live in rural areas (68.56%). Nearly, 40% of participants had not been involved in any work and were currently not in a union (22.25%). About 40.64% and 16.03% of respondents reported fair and poor self-rated health respectively.

Table 3: provides the percentage distribution of insomnia symptoms by different factors of the study population. All the predicted variables except tobacco consumption were found highly significant in terms of association with insomnia symptoms [*P* value: 0.000]. Respondents with hypertension (32.54%) and heart disease (4.96%) had a significant prevalence of insomnia symptoms. Respondents who suffered from neurological problems (3.48%), lung diseases (8.47%), and bone/joint-related diseases (19.89%) had a higher chance of insomnia at night.

Older adults who reported not having reading habits (72.55%), never watching television/listening to music (31.72%), and did not go to a park or beach for leisure hour spending (84.98%) had a prevalence of sleeplessness at night. Peoples with a habit of alcoholic beverage consumption also shows a higher chance of association with insomnia symptoms (22.32%).

Out of the total study population, 46.12% of respondents aged 45–59 reported having insomnia symptoms. The analysis also revealed that older women had a higher prevalence of insomnia symptoms. Moreover, the prevalence of insomnia symptoms was high among those individuals who were not in a union, residing in rural areas, reported as having fair and poor health status, and not being involved in any kind of work.

Table 4 provides the result of a multivariate analysis of the binary logistic regression model with a 95% confidence interval which estimates the likelihood of insomnia symptoms over the selected explanatory variables concerned with morbidity factors, lifestyle factors, and individual background characteristics in the

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Table 3 Percentage distribution assessing the association of insomnia symptoms over the explanatory variables in the study population

Variables	Insomnia symptom (%)	Chi-square & *p*-value
Health factors[a]		
Hyper tension		
Yes	32.54	450.209
No	67.46	[0.000]
Heart Diseases		
Yes	4.96	136.812
No	95.04	[0.000]
Neurological Problem		
Yes	3.48	191.818
No	96.52	[0.000]
Lungs Diseases		
Yes	8.47	276.450
No	91.53	[0.000]
Bone/Joint diseases		
Yes	19.89	688.587
No	80.11	[0.000]
Lifestyle factors		
Reading habits		
Daily	12.09	281.280
Sometimes	15.36	[0.000]
Never	72.55	
Alcohol consumption		
Yes	22.32	25.414
Never	77.68	[0.001]
Watch television/listen to music		
Daily	43.24	107.178
Sometimes	25.04	[0.000]
Never	31.72	
Tobacco consumption		
Yes	44.29	0.021
No	55.71	[0.885]
Go to a park or beach to relax		
Daily	1.28	50.368
Sometimes	13.74	[0.000]
Never	84.98	
Background factors		
Age		
45–59	46.12	414.413
60–74	41.21	[0.000]
74+	12.67	
Sex		
Male	53.77	471.445
Female	46.23	[0.000]
Residence		
Rural	71.69	89.226
Urban	28.31	[0.000]

Table 3 (continued)

Variables	Insomnia symptom (%)	Chi-square & *p*-value
Marital status		
Currently in union	72.17	353.001
Currently not in union	27.83	[0.000]
Self-rated health		
Good	31.27	1700
Fair	43.55	[0.000]
Poor	25.19	
Working status		
Yes	54.94	692.235
No	45.06	[0.000]

The *P*-value is derived from Pearson's Chi-square test

[a] Self-reported by the participants

study population. In the final adjusted model, it can be observed that most of the exposures create a remarkable contribution to the model. Respondents having hypertension and heart diseases had a 33 percent [AOR: 1.33, CI: 1.27−1.39] and 37 percent [AOR: 1.37, CI: 1.23−1.53] significantly higher likelihood of having insomnia symptoms compared to respondents who did not bear hypertension and heart diseases. Similarly, it was found that individuals who stand with neurological problems [AOR: 1.67 CI: 1.46−1.91], lungs [AOR: 1.43 CI: 1.32−1.56], and bone-related diseases [AOR: 1.56 CI: 1.47−1.65] were more likely to have insomnia signs than their counterpart.

Interestingly, older adults who read newspapers/magazines/books for some time or never had higher odds of sleeping chaos than older adults who had a reading habit daily [AOR: 1.35 CI: 1.26−1.45]. Older adults who consumed alcohol had a 7 percent likelihood of insomnia in comparison to older adults who did not consume alcohol [AOR: 1.07 CI: 1.01−1.13]. Curiously, older adults who did not ever watch Television or listen to any kind of music [AOR: 1.07 CI: 1.01−1.13] and did not go to the park/beach [AOR: 1.38 CI: 1.01−1.73] had a significant positive association with insomnia symptoms in comparison to the older adults' group who usually watch TV/listen to music and go to park/beach on regular basis.

The elderly reached 75 years and above, older women, and those residing in rural areas had a higher likelihood of insomnia. Additionally, older adults who were not currently in union and not involved in any kind of work were more prone to a higher likelihood of chance of insomnia symptoms than their counterparts. Moreover, older adults who rated poor health status were two times more likely to bear of having insomnia symptoms.

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Table 4 Logistic regression estimates for insomnia symptoms by morbidity, lifestyle, and background characteristics among older adults in India

Variables	UOR	Model-1 [95% CI]	*P*-value	AOR	Model-2 [95% CI]	*P*-value
Adjusted model						
Health factors[b]						
Hyper tension						
No[®]						
Yes	1.61[a]	1.54–1.68	0.000	1.33[a]	1.27–1.39	0.000
Heart Diseases						
No[®]						
Yes	1.81[a]	1.64–2.01	0.000	1.37[a]	1.23–1.53	0.000
Neurological Problem						
No[®]						
Yes	2.40[a]	2.11–2.73	0.000	1.67[a]	1.46–1.91	0.000
Lungs Diseases						
No[®]						
Yes	1.94[a]	1.79–2.10	0.000	1.43[a]	1.32–1.56	0.000
Bone/Joint diseases						
No[®]						
Yes	2.05[a]	1.94–2.17	0.000	1.56[a]	1.47–1.65	0.000
Lifestyle factors						
Reading habits						
Daily[®]						
Sometimes	1.27[a]	1.18–1.37	0.000	1.27[a]	1.17–1.37	0.000
Never	1.61[a]	1.52–1.71	0.000	1.35[a]	1.26–1.45	0.000
Alcohol consumption						
Yes[®]						
Never	0.89	0.84–0.93	0.000`	1.07[a]	1.01–1.13	0.012
Watch television/listen to music						
Daily[®]						
Sometimes	1.15[a]	1.10–1.21	0.000	1.07[a]	1.02–1.33	0.009
Never	1.28[a]	1.22–1.34	0.000	1.07[a]	1.01–1.13	0.017
Go to a park or beach to relax						
Daily[®]						
Sometimes	1.65[a]	1.32–2.06	0.000	1.59[a]	1.27–2.00	0.000
Never	1.87[a]	1.51–2.32	0.000	1.38[a]	1.01–1.73	0.004
Background factors						
Age						
45–59[®]						
60–74	1.37[a]	1.31–1.43	0.000	1.07[a]	1.02–1.12	0.005
74 +	1.83[a]	1.71–1.95	0.000	1.16[a]	1.07–1.25	0.000
Sex						
Male[®]						
Female	1.56[a]	1.50–1.63	0.000	1.37[a]	1.30–1.43	0.000
Residence						
Urban[®]						
Rural	1.23[a]	1.18–1.29	0.000	1.18[a]	1.12–1.24	0.000
Marital status						
Currently in union[®]						
Currently not in union	1.55[a]	1.48–1.63	0.001	1.13[a]	1.07–1.19	0.000

Table 4 (continued)

Variables	Model-1			Model-2		
	UOR	*[95% CI]*	*P*-value	AOR	*[95% CI]*	*P*-value
Self-rated health						
Good[®]						
Fair	1.71[a]	1.64–1.79	0.000	1.48[a]	1.41–1.55	0.000
Poor	3.20[a]	3.03–3.39	0.000	2.28[a]	2.14–2.42	0.000
Working status						
Yes[®]						
No	1.72[a]	1.66–1.80	0.000	1.24[a]	1.18–1.31	0.000

UOR Unadjusted Odds Ratio, *AOR* Adjusted Odds Ratio, *CI* Confidence Interval; [®] = Reference Category; [a] statistically significant at 95% CI

[b] Self-reported by the participants

Discussion

In our present study insomnia symptom was prevalent in nearly 30 percent of the middle-aged and older adult group of the Indian population enduring sleeplessness symptoms, at least one (trouble falling asleep, waking up too early in the morning, waking up during the night frequently) mentioned in the bracket, included in the analysis. In the preceding study, the generality of insomnia symptoms among older adults was reported to stand within the range of between 15 to 33% in the Indian context (Jaisoorya et al. 2018), but the current analysis laid out a prevalence of insomnia symptoms among the older adults. The ubiquity of sleeplessness was an excessive estimated figure of 37.7% among older adults who are in the age group of 65 years or above in low and middle-income countries including India due to poor socio-economic and lifestyle status (Mazzotti et al. 2012).

Our study recognized a conspicuous dissimilarity between the sexes regarding insomnia symptoms. These pronounced differences are often connected to health and social factors such as psychological disorders, cardiovascular diseases, widowhood, and lack of social support of older women (Jaussent et al. 2011; Li et al. 2002). Our research also finds a positive relation between increasing insomnia symptoms with age. With increasing age, total sleeping time and pattern gravitate to depthless and more tumble down among middle age population and it is continued up to the next older adults group due to inactivity and several diseases (Ohayon et al. 2001). Our study noticed that unmarried or widowed individuals had higher chances of having insomnia symptoms. The possible explanation may be that marriage acts as a cardinal and personal bond between individuals, and it is a part of relevant social variables that glance at the connection between health and mortality (Kawata et al. 2020). In keeping with certain studies (Evandrou et al. 2017; Kawata et al. 2020) economic stress caused by joblessness has been suggested as a risk factor for sleep disruption.

After adjusting all the background characteristics, we found a positive association between insomnia and not being engaged in any kind of work.

The study also revealed the effect of the morbidity conditions on insomnia symptoms in older adults and found it remarkable. The present study showed that older adults with heart diseases and neurological problems had higher odds of insomnia symptoms. Similar to our research, Earlier research had shown an adequate association of neurological disorders and heart diseases with insomnia among older Americans (Dunietz et al. 2020). It is often seen that bone-related diseases are ascribed to pain that forms sleep disorders at night when the body is at rest (Sabbatini et al. 2002). In this way, our research also highlighted a positive association between insomnia symptoms and bone/joint-related diseases. In our study, the odds of having hypertension were 1.50 times higher in those having insomnia symptoms compared to those with no hypertension. The likely reason may be that hypertension increases the arousal of the nervous system and makes it difficult to maintain sleep (Li et al. 2015). This research highlights that older adults who suffer from lung diseases are more likely to have insomnia. Earlier research has shown the possible reason may be that due to lung diseases, a lower level of oxygen is saturated during sleep (Valipour et al. 2011).

Lifestyle factors play a vital role in maintaining proper sleep. Factors like reading habits, alcohol consumption, watching TV/listening to music, and going to a park or beach were significant factors of insomnia symptoms. There are multiple relaxation way options available to older adults to improve their quality of sleep such as reading books before bedtime or spending a fruitful leisure hour (Petit et al. 2003). The reading habit can enhance mental ability. An evidence-based study found that reading printed books can reduce stress, be a beneficial bedtime routine, and induce relaxation before sleeping but it is essential to maintain an appropriate amount

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of reading like 5 books per year (Zhang et al. 2021). If an older individual goes to a park or sea beach and spends leisure hours with light background music it may enhance his/her mental ability as well as sleep quality (Sun et al. 2013). Smoked/smokeless tobacco consumption negatively impacts various aspects of health that lead to poor sleeping (Gambhir et al. 2014; Monterrosa-Castro et al. 2013; Phillips & Danner 1995). Moreover, the present study observes alcoholic beverage consumption is positively associated with insomnia symptoms. Perhaps alcohol consumption forms the impairment of limb movement, and normal breathing and also forms rapid eye movement during sleep (Chakravorty et al. 2016; He et al. 2019).

There is a chance that the pervasiveness of insomnia symptoms could be determined by other diseases and factors that were not considered in this study. If this paper uses longitudinal analysis, a more detailed relationship can be obtained. There may be some confounding factors that are not considered in this study. Moreover, self-reported insomnia symptoms are a significant limitation because they may form reporting bias and be difficult to recall sometimes. It will be better if we consider the frequency of tobacco (smoked/smokeless), and alcohol consumption.

Regardless of the limitation, the study stands in a significant place as it emphasizes highlighting the sleep chaos or insomnia symptoms among older adults aged 45 years and above residing in India under the reflection of morbidities, improper lifestyle practices, and poor socio-economic characteristics.

Conclusion

Our study has uncovered the prevalence of insomnia and its pertinent risk factors among the middle aged as well as older adults population in India. In this way, this study indicates the relationship between morbidities, unhealthy lifestyles, and insomnia symptoms. Therefore, insomnia symptoms identification on time, and implementing policies based on the health care system, improving lifestyle may aid in reducing such consequences. Moreover, different public service interventions such as specific disease-reducing initiatives, and encouraging physical activities may assist in improving sleep quality among the older population.

Abbreviations
UOR   Unadjusted Odds Ratio
AOR   Adjusted Odds Ratio
CI   Confidence Interval

Declarations

Ethics approval and consent to participate
The study used a data set that is available online in the public domain; hence, there was no need to seek ethical approval to publish this study.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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