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Comparative insomnia prevalence between geriatrics lived in urban and rural areas: a multicenter nationwide study analysis

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Abstract

Aims Insomnia is a common complaint among older adults. However, the comparative prevalence between older adults living in urban versus rural areas remains under-researched. This study aims to validate the overall prevalence of insomnia among older adults in Indonesia and investigate the comparative prevalence between older adults living in urban and rural areas.

Methods The data were derived from the 2018 Indonesian Basic Health Research Study. We included a total of 93,830 older participants aged > 60 years old who completed the insomnia questions. The prevalence and regression models were analyzed using the SPSS software.

Results The insomnia group has a higher age compared to the non-insomnia group ($P < 0.05$). Insomnia is more prevalent in females compared to males ($P < 0.05$). When classified by age groups (60–64, 65–69, 70–74, and > 75 years old), the prevalence of insomnia was 20%, 21%, 23%, and 24%, respectively. The prevalence of insomnia among older individuals living in rural areas was higher compared to those living in urban areas. In addition, increasing age, being female, unemployed, having comorbidities, being less active, and drinking alcohol are associated with insomnia symptoms.

Conclusion The findings of this study indicated that the prevalence of insomnia is high among older adults in Indonesia, with older adults living in rural areas exhibiting a higher prevalence compared to those living in urban areas. Our findings strengthen the importance of sleep management in clinical or community settings.

Keywords Insomnia, Older adults, Community, Insomnia screening, Elderly

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Introduction

Sleep issues among older adults have received significant attention due to the world's aging population [1]. Insomnia is a common complaint among older adults, with estimated prevalence ranging from 12 to 40% [2, 3]. Insomnia has been linked to cognitive impairment [4], lower health-related quality of life [5, 6], and a higher economic burden [7]. Implementing interventions to improve sleep quality in older individuals is clinically relevant for supporting healthy aging.

It is critical for health officials to identify patterns of insomnia to understand their detrimental impact and implement suitable prevention efforts. The prevalence of insomnia in the general population varies significantly between studies (6–50%) [8], due to variations in diagnostic methods, study sites, and terminology [9]. Existing research suggests that sociocultural influences play an essential role in sleep problems [10, 11]. Hence, the investigation of insomnia should be studied independently in different societies and populations.

Recent meta-analysis suggested that the prevalence of sleep disturbance among Chinese older adults was 35.9% [12]. One of the key factors contributing to sleep difficulties is advancing age [13]. In Indonesia, adults aged 60 years old or older made up 9.7% (almost 26 million) of the total population in 2019. However, no current study has investigated the prevalence of insomnia among older adults in Indonesia. Understanding the prevalence of insomnia in this population is crucial, given the detrimental effects of sleep disturbances on health and the fast-aging demographic trend in Indonesia. Additionally, further investigation into the prevalence of insomnia based on geographic locations such as urban or rural areas is important [14–16].

This study aims to validate the overall prevalence of insomnia. Secondly, we aim to investigate the comparative prevalence of insomnia among older adults live in urban and rural areas in Indonesia.

Methods

Data source

This study utilized cross-sectional data from the 2018 Indonesian Basic Health Research Study (Riskesdas, 2018), which is accessible through the following link: http://litbang.kemkes.go.id/. Riskesdas is a nationally representative survey conducted by the National Institute of Health Research and Development (NIHRD) every five years in all 34 provinces and 514 districts of Indonesia. Enumerators conduct interviews using a two-stage random sample method, selecting neighborhood census blocks from each district/municipality in proportion to their population size. The survey employed 30,000 census blocks chosen at random from all possible census blocks.

Ethical approval

Prior to data collection, the NIHRD Ethics Committee obtained ethical clearance. Before data collection began, all participants provided their written, informed consent.

Inclusion and exclusion criteria

To meet the inclusion criteria, we only included participants who met the following conditions: (1) were older than 60 years, and (2) had completed responses for the insomnia variable. Participants younger than 60 years old or those with missing data on the insomnia variable were excluded from the analysis.

Dependent variable

Insomnia symptom

Insomnia was defined based on the criteria of experiencing difficulty falling asleep or maintaining sleep. Enumerators asked a yes-no question during the interview process: 'During the last 2 weeks, have you had trouble sleeping almost every night (difficulty getting to sleep, waking up in the middle of the night, waking up early)?. Of note, previous numerous pieces of evidence have been published using a single item to detect the prevalence of insomnia [17].

Independent variables

Age and gender

Age was presented in number. For gender variable was male or female.

Marital status

For marital status, the answers consisted of 'single,' 'married,' or 'widow/widower'.

Smoking status

Smoking status was divided into three levels, including 'non-smoker,' 'smoke but not every day,' or 'smoke every day'.

Education

In terms of education, the responses were classified as 'no formal education,' 'non-university level,' or 'university level'.

Employment status

Employment status was defined as 'unemployed' or 'employed'.

Alcohol consumption

For alcohol consumption, it was assessed with the question 'Have you consumed alcoholic drinks in the last 1 month?'.

Type of residency

Type of residency was classified as 'urban' or 'rural' area.

Comorbidity

Some comorbid conditions, including a history of cancer, heart disease, asthma, chronic kidney disease, and stroke, were included. The history of these diseases was assessed using the question 'Have you ever been diagnosed with a … by a doctor?' Participants answered either 'yes' or 'no'.

Physical activity

Physical activity was divided into two categories: vigorous physical activity and moderate physical activity. Vigorous physical activity was assessed with the question, 'Do you usually engage in vigorous physical activity continuously for at least 10 minutes each time?' Similarly, moderate physical activity was inquired about using the question, 'Do you usually engage in moderate physical activity continuously for at least 10 minutes each time?' Participants were required to answer with either 'yes' or 'no.

Statistical analyses

All statistical analyses were performed using SPSS software, version 23.0 (IBM, Armonk, NY, USA). Statistical significance was defined as a two-tailed p-value of 0.05. We utilized the chi-squared test for categorical variables and the Mann-Whitney U test for continuous variables to determine whether the baseline characteristics of the two groups differed (insomnia vs. non-insomnia group). Regression analyses with one or more variables were conducted using univariate and multivariate logistic regression.

In the next step, we performed stratification analysis based on the type of residency. Finally, regression analyses using multivariate logistic regression were conducted to determine the predictors of insomnia stratified by the type of residency.

Results

Study characteristic

In total, 93,830 older participants meet the inclusion criteria and were included in the final analysis (see Supplementary Fig. 1). The comparison of participants' characteristics between older individuals with insomnia and those without insomnia is depicted in Table 1. The insomnia group had a higher mean age compared to the non-insomnia group. Females are more prevalent in the insomnia group compared to males. Almost 25% of the insomnia group were heavy smokers. In terms of urbanization, nearly 60% of insomnia participants lived in rural areas. Among them, 51% had employment status. Other details of demographic characteristics can be seen in Table 1.

For comorbid conditions, including cancer, heart disease, asthma, chronic kidney disease, and stroke, there was a significant difference between the insomnia and non-insomnia groups. Vigorous physical activity was observed in 19% of the insomnia group and 24% in the non-insomnia group. Meanwhile, moderate physical activity was lower in the insomnia group compared to the non-insomnia group (63.7% vs. 65.3%). Overall, there was a significant difference in all variables when comparing the insomnia and non-insomnia groups.

Prevalence of insomnia

The overall prevalence of insomnia is shown in Supplementary Fig. 2. To provide a more detailed insight into insomnia prevalence, we classified the age groups as 60–64, 65–69, 70–74, and >75 years old. Our findings suggest that the prevalence of insomnia increases with age groups (20%, 21%, 23%, and 24%, respectively).

The comparative prevalence of insomnia among older individuals living in urban and rural areas is shown in Fig. 1. The prevalence of insomnia among older individuals living in urban areas was 19%, 21%, 22%, and 23% among age groups (60–64, 65–69, 70–74, and >75 years old, respectively). Interestingly, we found that participants living in rural areas had a higher prevalence of insomnia among the age groups (aged 60–64 was 20%, 65–69 was 22%, 70–74 was 24%, and age>70 years old was 24%).

Regression analysis

The univariate and multivariate regression analyses are presented in Table 2. After controlling for significant variables in the univariate model, increasing age was associated with increased insomnia symptoms ($P<0.001$). Compared to females, males were less likely to experience insomnia ($P<0.001$). Participants with unemployed status were associated with increased insomnia symptoms ($P<0.001$). Participants living in urban areas were less likely to have insomnia compared to those living in rural areas ($P<0.001$). Participants who have comorbidities such as cancer, heart disease, asthma, and chronic kidney disease were linked to higher insomnia ($P<0.001$). Participants engaged in physical activity, whether vigorous or moderate, were less likely to develop insomnia ($P<0.001$).

Study characteristic stratified by type of residency

In total, participants living in urban areas ($n=38,488$) and rural areas ($n=55,342$) completed the survey. The mean age was 67.8 and 68.4 years, respectively. Of these, 8,041 participants had insomnia in urban areas, and 12,148 participants in rural areas reported insomnia. Other details are presented in Table 3. Age, gender, smoking status, education level, marital status, employment

Table 1 Characteristic of participants

Variables	Total		Insomnia		Non-insomnia		*p*-value
	n	(%)	*n*	(%)	*n*	(%)	
	93,830	(100)	20,189	(21.5)	73,641	(78.5)	
Age, mean (SD)	68.2	(7.1)	68.7	(7.3)	68.1	(7.1)	< 0.001
Gender, n (%)							< 0.001
Male	44,738	(47.7)	8,152	(40.4)	36,586	(49.7)	
Female	49,092	(52.3)	12,037	(59.6)	37,055	(50.3)	
Smoking							< 0.001
Non-smoker	59,837	(63.8)	13,348	(66.1)	46,489	(63.1)	
Yes (not every day)	8,586	(9.2)	1,861	(9.2)	6,725	(9.1)	
Yes (everyday)	25,407	(27.1)	4,980	(24.7)	20,427	(27.7	
Education							< 0.001
No formal education	18,242	(19.4)	4,048	(20.1)	14,194	(19.3)	
Non-university level	71,503	(76.2)	15,555	(77)	55,948	(76)	
University level	4,085	(4.4)	586	(2.9)	3,499	(4.8)	
Marital status							< 0.001
Single	1,505	(1.6)	328	(1.6)	1,177	(1.6)	
Married	59,649	(63.6)	11,875	(58.8)	47,774	(64.9)	
Widow/widower	32,676	(34.8)	7,986	(39.6)	24,690	(33.5)	
Employment							< 0.001
Unemployed	39,537	(42.1)	9,899	(49)	29,638	(40.2)	
Employed	54,293	(57.9)	10,290	(51)	44,003	(59.8)	
Type of residency							< 0.001
Urban	38,488	(41)	8,041	(39.8)	30,447	(41.3)	
Rural	55,342	(59)	12,148	(60.2)	43,194	(58.7)	
Cancer							< 0.001
No	93,468	(99.6)	20,072	(99.4)	73,396	(99.7)	
Yes	362	(0.4)	117	(0.6)	245	(0.3)	
Heart disease							< 0.001
No	89,761	(95.7)	18,977	(94)	70,784	(96.1)	
Yes	4,069	(4.3)	1,212	(6)	2,857	(3.9)	
Asthma							< 0.001
No	89,675	(95.6)	18,852	(93.4)	70,823	(96.2)	
Yes	4,155	(4.4)	1,337	(6.6)	2,818	(3.8)	
CKD							0.003
No	93,123	(99.2)	20,005	(99.1)	73,118	(99.3)	
Yes	707	(0.8)	184	(0.9)	523	(0.7)	
Stroke							< 0.001
No	90,340	(96.3)	19,100	(94.6)	71,240	(96.7)	
Yes	3,490	(3.7)	1,089	(5.4)	2,401	(3.3)	
Vigorous PA							< 0.001
No	72,711	(77.5)	16,363	(81)	56,348	(76.5)	
Yes	21,119	(22.5)	3,826	(19)	17,293	(23.5)	
Moderate PA							< 0.001
No	32,893	(35.1)	7,330	(39.3)	25,563	(34.7)	
Yes	60,937	(64.9)	12,859	(63.7)	48,078	(65.3)	
Alcohol							< 0.001
No	91,748	(97.8)	19,670	(97.4)	72,078	(97.9)	
Yes	2,082	(2.2)	519	(2.6)	1,563	(2.1)	

n = number of participants; SD = standard deviation; CKD = chronic kidney disease; PA = physical activity

Continuous variable was performed by using Mann Whitney U test,

Categorical variables were performed by using chi-square test

The age variable is presented as mean and standard deviation, while all other variables are listed by the number of participants included and the corresponding percentage

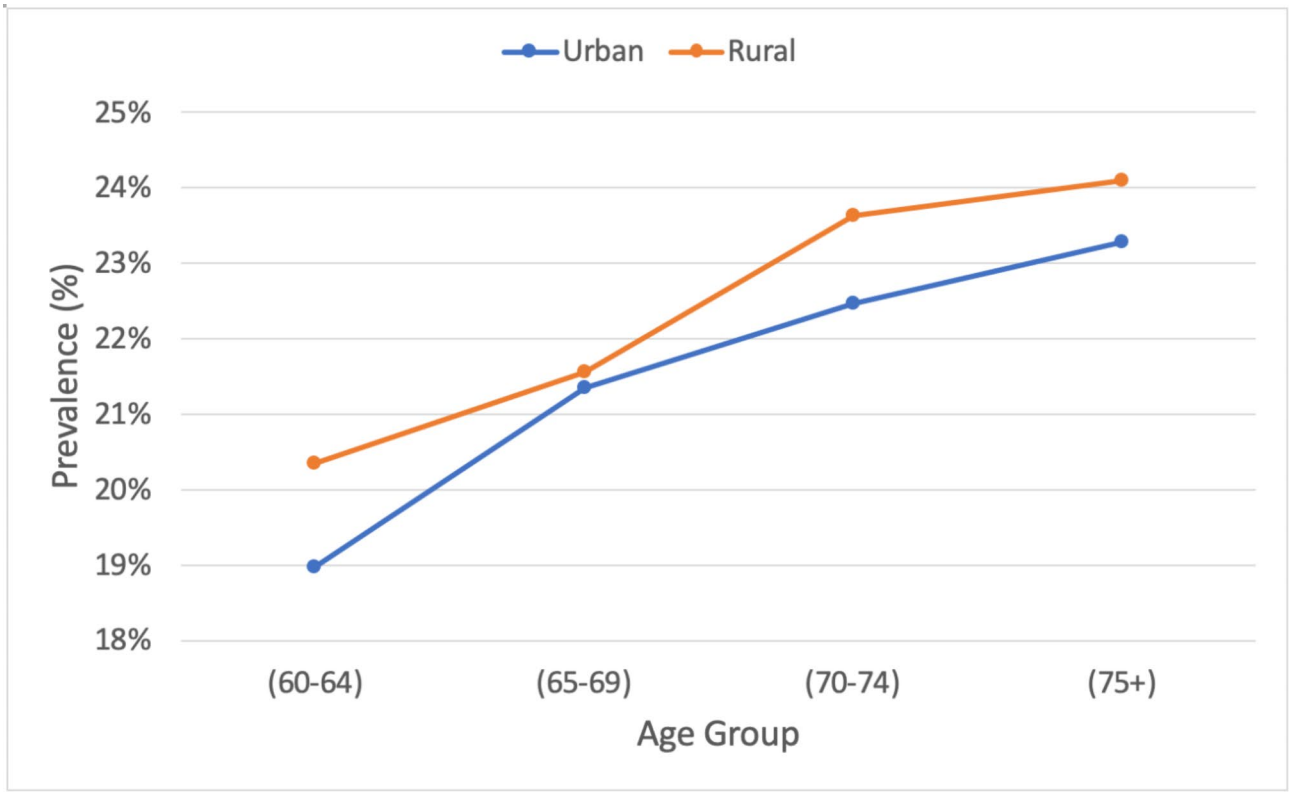

Fig. 1 Insomnia prevalence by type of residency and age group

status, comorbidities (cancer, heart disease, asthma, and stroke), and physical activity (vigorous and moderate) were significantly different between participants residing in urban and rural areas (all $P<0.05$). In addition, chronic kidney disease and alcohol consumption were only have significantly different between participants residing rural areas (all $P<0.05$).

To select potential confounders for entering into multivariable regression model, variables that were statistically different between groups ($P<0.25$) were then entered as covariates into the multivariate logistic regression model according to type or residency.

Multivariable logistic regression models of predicting Insomnia stratified by type of residency

Table 4 provided the result of logistic regression stratification analysis. In the urban group, increasing age, smoking, having no education or non-university level education significantly increase the risk of insomnia ($P<0.05$). Being male and married decreases the risk of insomnia significantly ($P<0.05$). Being unemployed and having comorbidities such as heart disease, asthma, and stroke were significantly associated with the risk of insomnia ($P<0.05$).

In the rural group, increasing age, smoking, having no education or non-university level education significantly increase the risk of insomnia ($P<0.05$). Being male and engaging in vigorous physical activity decrease the risk of insomnia significantly ($P<0.05$). Being unemployed and having comorbidities such as cancer, heart disease, asthma, chronic kidney disease, stroke, and alcohol consumption were significantly associated with the risk of insomnia ($P<0.05$).

Discussion

To the best of our knowledge, this is the first study investigating the comparative prevalence of insomnia between urban and rural areas in older adults. Our findings highlight that the overall prevalence of insomnia among older adults remains high. Our findings support the previous similar research suggesting the prevalence of insomnia in this population is high [12]. Of note, older adults living in rural areas had a higher prevalence of insomnia compared to those living in urban areas. Because we used a large sample size and rigorous methodology, our study should be considered valid.

We found that the prevalence of insomnia in this study is 22%. Previous meta-analyses found a higher pooled prevalence of insomnia in a similar population in China [12]. However, individual studies have reported a wide range of prevalence, varying from 6 to 42% among older adults [18, 19]. The variation in insomnia prevalence is due to the heterogeneity of the measurement methods; studies using standard diagnoses have lower prevalence

Table 2 Associations between participants characteristics and insomnia symptom using logistic regression

Variables	OR[C]	(95% CI)	*P*-value	OR[A]	(95% CI)	*P*-value
Age	0.012		< 0.001	0.005		< 0.001
Gender						
Female	Ref.			Ref.		
Male	0.686	(0.665 to 0.708)	< 0.001	0.747	(0.719 to 0.775)	< 0.001
Marital status						
Widow/widower	Ref.			Ref.		
Single	0.862	(0.760 to 0.9766)	0.02	0.988	(0.871 to 1.121)	0.85
Married	0.768	(0.744 to 0.794)	< 0.001	0.936	(0.902 to 0.972)	< 0.001
Employment						
Employed	Ref.			Ref.		
Unemployed	1.428	(1.384 to 1.474)	< 0.001	1.225	(1.181 to 1.271)	< 0.001
Type of residency						
Rural	Ref.			Ref.		
Urban	0.939	(0.910 to 0.969)	< 0.001	0.898	(0.869 to 0.928)	< 0.001
Cancer						
No	Ref.			Ref.		
Yes	1.746	(1.400 to 2.178)	< 0.001	1.587	(1.270 to 1.984)	< 0.001
Heart disease						
No	Ref.			Ref.		
Yes	1.582	(1.477 to 1.695)	< 0.001	1.499	(1.397 to 1.609)	< 0.001
Asthma						
No	Ref.			Ref.		
Yes	1.782	(1.667 to 1.906)	< 0.001	1.757	(1.641 to 1.880)	< 0.001
CKD						
No	Ref.			Ref.		
Yes	1.286	(1.086 to 1.522)	0.003	1.238	(1.044 to 1.469)	0.01
Vigorous PA						
No	Ref.			Ref.		
Yes	0.762	(0.733 to 0.792)	< 0.001	0.919	(0.880 to 0.959)	< 0.001
Moderate PA						
No	Ref.			Ref.		
Yes	0.933	(0.903 to 0.964)	< 0.001	0.973	(0.940 to 1.006)	< 0.001
Alcohol consumption						
No	Ref.			Ref.		
Yes	1.217	(1.100 to 1.345)	< 0.001	1.528	(1.379 to 1.693)	< 0.001

OR[C]= crude odds ratio of univariate model; OR[A]= adjusted odds ratio of multivariate model; Ref = reference

Adjusted by all significant variables in Table 1

rates compared to those using self-reported instruments [20, 21]. Early screening for insomnia using accurate measurement scales is urgently needed.

The mechanism of insomnia among older adults is complex. Several studies suggest that increasing age is linked to the presence of insomnia [22]. Living alone during old age is also associated with insomnia [23]. The presence of several chronic diseases may contribute to the development of insomnia in older adults [24].

On the other hand, our research might explore the complex interactions between the physiological and social factors that lead to insomnia. The quality of sleep can be greatly impacted by social factors, including community support, healthcare accessibility, and lifestyle variations between urban and rural settings [15, 16]. Greater access to healthcare facilities and services in urban locations may facilitate the earlier diagnosis and treatment of sleep disorders [25]. As a result, insomnia may go undiagnosed and untreated in rural locations due to a lack of specialist healthcare facilities [26, 27]. Furthermore, social interaction, noise levels, and environmental variables may all have distinct effects on sleep patterns in urban and rural environments [28, 29]. Age-related physiological changes in sleep architecture, such as a reduction in slow-wave sleep and an increase in awakenings [30, 31], may make symptoms of insomnia worse. Developing focused therapies to enhance sleep health in older individuals in a variety of living circumstances requires an understanding of these complex aspects.

Table 3 Characteristic of participants stratified by type of residency

Variables	Urban							Rural						
	Total		Insomnia		Non-insomnia		*P*	Total		Insomnia		Non-insomnia		*P*
	(*n* = 38,488)		(*n* = 8,041)		(*n* = 30,447)			(*n* = 55,342)		(*n* = 12,148)		(*n* = 43,194)		
Age, mean (SD)	67.8	(6.9)	68.3	(7.1)	67.7	(6.8)	< 0.001	68.4	(7.3)	68.9	(7.4)	68.3	(7.2)	< 0.001
Gender, n (%)							< 0.001							< 0.001
Male	18,068	(46.9)	3,113	(38.7)	14,955	(49.1)		26,679	(48.2)	5,039	(41.5)	21,631	(50.1)	
Female	20,420	(53.1)	4,928	(61.3)	15,492	(50.9)		28,672	(51.8)	7,109	(58.5)	21,563	(49.9)	
Smoking							< 0.001							< 0.001
Non-smoker	25,119	(65.3)	5,427	(67.5)	19,692	(64.7)		34,718	(62.7)	7,921	(25.6)	26,797	(62)	
Yes (not every day)	3,720	(9.7)	743	(9.2)	2,977	(9.8)		4,866	(8.8)	1,118	(9.8)	3,748	(8.7)	
Yes (everyday)	9,649	(25.1)	1,871	(23.3)	7,778	(25.5)		15,758	(28.5)	3,109	(25.6)	12,649	(29.3)	
Education							< 0.001							< 0.001
No formal education	5,007	(13)	1,114	(13.9)	3,893	(12.8)		13,235	(23.9)	2,934	(24.2)	10,301	(23.8)	
Non-university level	30,399	(79)	6,490	(80.7)	23,909	(78.5)		41,104	(74.3)	9,065	(74.6)	32,039	(74.2)	
University level	3,082	(8)	437	(5.4)	2,645	(8.7)		1,003	(1.8)	149	(1.2)	854	(2)	
Marital status							< 0.001							< 0.001
Single	721	(1.9)	139	(1.7)	582	(1.9)		784	(1.4)	189	(1.6)	595	(1.4)	
Married	23,846	(62)	4,517	(56.2)	19,329	(63.5)		35,803	(64.7)	7,358	(60.6)	28,445	(32.8)	
Widow/widower	13,921	(36.2)	3,385	(42.1)	10,536	(34.6)		18,755	(33.9)	4,601	(37.9)	14,154	(32.8)	
Employment							< 0.001							< 0.001
Unemployed	19,336	(50.2)	4,714	(58.6)	14,622	(48)		19,871	(35.9)	5,120	(42.1)	14,751	(34.2)	
Employed	19,152	(49.8)	3,327	(41.4)	15,825	(52)		35,471	(64.1)	7,028	(57.9)	28,443	(65.8)	
Cancer							0.03							< 0.001
No	38,285	(99.5)	7,987	(99.3)	30,298	(99.5)		55,183	(99.7)	12,085	(99.5)	43,098	(99.8)	
Yes	203	(0.5)	54	(0.7)	149	(0.5)		159	(0.3)	63	(0.5)	96	(0.2)	
Heart disease							< 0.001							< 0.001
No	36,216	(94.1)	7,389	(91.9)	28,827	(94.7)		53,545	(96.8)	11,588	(95.4)	41,957	(97.1)	
Yes	2,271	(5.9)	652	(8.1)	1,620	(5.3)		1,797	(3.2)	560	(4.6)	1,237	(2.9)	
Asthma							< 0.001							< 0.001
No	36,969	(96.1)	7,549	(93.9)	29,420	(96.6)		52,706	(95.2)	11,303	(93)	41,403	(95.9)	
Yes	1,519	(3.9)	492	(6.1)	1,027	(3.4)		2,636	(4.8)	845	(7)	1,791	(4.1)	
CKD							0.25							0.001
No	38,488	(99.2)	7,970	(99.1)	30,204	(99.2)		54,949	(99.3)	12,035	(99.1)	42,914	(99.4)	
Yes	314	(0.8)	71	(0.9)	243	(0.8)		393	(0.7)	113	(0.9)	280	(0.6)	
Stroke							< 0.001							< 0.001
No	36,635	(95.2)	7,501	(93.3)	29,134	(95.7)		53,705	(97)	11,599	(95.5)	42,106	(97.5)	
Yes	1,853	(4.8)	540	(6.7)	1,313	(4.3)		1,637	(3)	549	(4.5)	1,088	(2.5)	
Vigorous PA							< 0.001							< 0.001
No	32,577	(84.6)	6,980	(86.8)	25,597	(84.1)		40,134	(72.5)	9,383	(77.2)	30,751	(71.2)	
Yes	5,911	(15.4)	1,061	(13.2)	4,859	(15.9)		15,208	(27.5)	2,765	(22.8)	12,443	(28.8)	
Moderate PA							< 0.001							< 0.001
No	13,729	(35.7)	3,007	(37.4)	10,722	(35.2)		19,164	(34.6)	4,323	(35.6)	14,841	(34.4)	
Yes	24,759	(64.3)	5,034	(62.6)	19,725	(64.8)		36,178	(65.4)	7,825	(64.4)	28,353	(65.6)	
Alcohol							0.49							< 0.001
No	37,934	(98.6)	7,926	(98.6)	30,008	(98.6)		53,814	(97.2)	11,744	(96.7)	42,070	(97.4)	
Yes	554	(1.4)	115	(1.4)	439	(1.4)		1,528	(2.8)	404	(3.3)	1,124	(2.6)	

n = number of participants; SD = standard deviation; CKD = chronic kidney disease; PA = physical activity; *P* = *P*-value

Continuous variable was performed by using Mann Whitney U test,

Categorical variables were performed by using chi-square test

Of note, the prevalence of insomnia was higher in older adults who lived in rural areas compared to those who lived in urban areas. Consistent with a previous study, older adults living in rural areas had an insomnia prevalence of 50% among the Chinese population [32]. In contrast, the prevalence of insomnia was found to be 37% among the older population living in urban areas [33]. Low levels of education, living alone, and limited access

Table 4 Multivariable logistic regression models of predicting Insomnia stratified by type of residency

Variables	OR[A]	(95% CI)	*P*-value
Urban (*n* = 38,488)			
Age	0.005		< 0.05
Gender			
Female	Ref.		
Male	0.591	(0.547 to 0.638)	< 0.001
Smoking			
Non-smoker	Ref.		
Yes (not every day)	1.418	(1.308 to 1.537)	< 0.001
Yes (everyday)	1.334	(1.209 to 1.472)	< 0.001
Education			
No formal education	1.409	(1.242 to 1.598)	
Non-university level	1.494	(1.342 to 1.662)	
University level	Ref.		
Marital status			
Widow/widower	Ref.		
Single	0.880	(00.726 to 1.066)	0.19
Married	0.902	(0.851 to 0.957)	0.001
Employment			
Employed	Ref.		
Unemployed	1.288	(1.217 to 1.364)	< 0.001
Heart disease			
No	Ref.		
Yes	1.505	(1.366 to 1.658)	< 0.001
Asthma			
No	Ref.		
Yes	1.855	(1.657 to 2.076)	< 0.001
Stroke			
No	Ref.		
Yes	1.543	(1.387 to 1.717)	< 0.001
Rural (*n* = 55,342)			
Age	0.006		< 0.001
Gender			
Female	Ref.		
Male	0.660	(0.621 to 0.702)	< 0.001
Smoking			
Non-smoker	Ref.		
Yes (not every day)	1.197	(1.125 to 1.274)	< 0.001
Yes (everyday)	1.315	(1.214 to 1.425)	< 0.001
Education			
No formal education	1.398	(1.165 to 1.677)	< 0.001
Non-university level	1.524	(1.276 to 1.821)	< 0.001
University level	Ref.		
Employment			
Employed	Ref.		
Unemployed	1.157	(1.102 to 1.215)	< 0.001
Cancer			
No	Ref.		
Yes	2.086	(1.510 to 2.882)	< 0.001
Heart disease			
No	Ref.		
Yes	1.473	(1.327 to 1.635)	< 0.001
Asthma			
No	Ref.		

Table 4 (continued)

Variables	OR[A]	(95% CI)	*P*-value
Yes	1.698	(1.558 to 1.851)	< 0.001
CKD			
No	Ref.		
Yes	1.360	(1.088 to 1.701)	< 0.001
Stroke			
No	Ref.		
Yes	1.721	(1.545 to 1.916)	< 0.001
Vigorous PA			
No	Ref.		
Yes	0.865	(0.821 to 0.912)	< 0.001
Alcohol consumption			
No	Ref.		
Yes	1.579	(1.403 to 1.777)	< 0.001

OR[A]= adjusted odds ratio of multivariate model; Ref=reference

Adjusted by all significant variables in Table 3

to medical institutions may provide possible explanations [32]. This suggests the urgency of enhancing sleep education equally across different geographic locations.

A number of limitations are highlighted in this study. First, because this dataset does not include objective data such as polysomnographic data, other sleep problems may go unnoticed and end up being misdiagnosed as insomnia. Secondly, insomnia was defined from a single-item questionnaire. Further studies are warned to validate our findings. Third, the internal validity may be compromised by the inability to acquire possible confounders, such as dietary factors, environmental factors, and potential hypnotic use. However, this study also has several strengths. Firstly, the study population was drawn from participants all around Indonesia, making it nationally representative. Secondly, every interviewer received training to comprehend the questionnaire's structure and approach.

Conclusion

The prevalence of insomnia is high among older adults in Indonesia, with older adults living in rural areas exhibiting a higher prevalence compared to those living in urban areas. These findings offer an early overview, providing valuable insights for policymakers. It is strongly recommended to implement early insomnia screening using valid measurements.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12889-024-19876-x.

Supplementary Material 1

Supplementary Material 2

Author contributions

BD devised the research question and examined the data. FH and RW evaluated the data, and SS assessed the text. All authors have read and approved the manuscript, and this is verified.

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Data availability

All data analyzed for this study can be accessed here: https://repository.badankebijakan.kemkes.go.id/id/eprint/3514/.

Declarations

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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