

ASSOCIATION BETWEEN INSOMNIA AND ANXIETY AMONG ELDERLY INDIVIDUALS WITH HYPERTENSION IN INDONESIA: EVIDENCE FROM THE 2023 NATIONAL HEALTH SURVEY

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ABSTRACT

Introduction: Insomnia and anxiety often coexist in the elderly, especially those with hypertension. This study aims to analyze the relationship between insomnia and anxiety in Indonesian elderly with hypertension using data from the 2023 Indonesian Health Survey (SKI). **Methods:** The analysis was conducted on 20,865 individuals aged ≥ 60 years with hypertension. Insomnia was measured based on self-reported sleep difficulties, while anxiety was measured by persistent feelings of anxiety. Chi-square tests were conducted, accounting for complex survey design. **Results:** Bivariate analysis using the chi-square test showed a significant association between insomnia and anxiety ($p < 0.001$). As a result, 64.3% of individuals with anxiety also experienced insomnia, compared with 16.3% of those without anxiety. The odds ratio for the association between insomnia and anxiety was 4.73 (95% CI: 4.16–5.38), indicating that elderly with insomnia were almost 5 times more likely to experience anxiety compared to those without insomnia. Other factors associated with anxiety included female gender ($p < 0.001$), divorced marital status ($p = 0.024$), low education ($p = 0.007$), unemployed employment status ($p = 0.001$), and feelings of unhappiness ($p = 0.001$). **Conclusion:** These findings emphasize the importance of screening for insomnia and anxiety in the management of hypertension in the elderly

Keywords: anxiety, elderly, hypertension, insomnia, Indonesian Health Survey.

HUBUNGAN ANTARA INSOMNIA DAN KECEMASAN PADA LANSIA DENGAN HIPERTENSI DI INDONESIA: BUKTI DARI SURVEI KESEHATAN INDONESIA TAHUN 2023

ABSTRAK

Pendahuluan: Insomnia dan kecemasan sering terjadi secara bersamaan pada lansia, terutama pada individu dengan hipertensi. Penelitian ini bertujuan untuk menganalisis hubungan antara insomnia dan kecemasan pada lansia dengan hipertensi di Indonesia menggunakan data Survei Kesehatan Indonesia (SKI) tahun 2023. **Metode:** Analisis dilakukan pada 20.865 individu berusia ≥ 60 tahun dengan hipertensi. Insomnia diukur berdasarkan laporan responden mengenai kesulitan tidur, sedangkan kecemasan diukur berdasarkan adanya perasaan cemas yang menetap. Uji chi-square dilakukan dengan mempertimbangkan desain survei kompleks. **Hasil:** Analisis bivariat menggunakan uji chi-square menunjukkan adanya hubungan yang signifikan antara insomnia dan kecemasan ($p < 0,001$). Sebanyak 64,3% individu dengan kecemasan juga mengalami insomnia, dibandingkan dengan 16,3%

pada individu tanpa kecemasan. Nilai odds ratio hubungan antara insomnia dan kecemasan sebesar 4,73 (95% CI: 4,16–5,38), yang menunjukkan bahwa lansia dengan insomnia memiliki kemungkinan hampir 5 kali lebih besar mengalami kecemasan dibandingkan lansia tanpa insomnia. Faktor lain yang berhubungan dengan kecemasan meliputi jenis kelamin perempuan ($p < 0,001$), status perkawinan cerai ($p = 0,024$), pendidikan rendah ($p = 0,007$), tidak bekerja ($p = 0,001$), dan perasaan tidak bahagia ($p = 0,001$). **Kesimpulan:** Temuan ini menegaskan pentingnya skrining insomnia dan kecemasan dalam pengelolaan hipertensi pada lansia.

Kata Kunci: hipertensi, insomnia, kecemasan, lansia, Survei Kesehatan Indonesia.

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INTRODUCTION

Hypertension is one of the most common chronic diseases among the elderly and a major health problem in Indonesia. According to the latest national health survey, hypertension affects a significant proportion of Indonesian adults aged 60 years and older, contributing to cardiovascular morbidity, mortality, and reduced quality of life (Whelton et al., 2018). In addition to physical impacts, hypertension is also closely linked to mental health problems, particularly anxiety.

Anxiety in older adults with hypertension is often overlooked in diagnosis and treatment, even though it can worsen blood pressure control and reduce quality of life (Aust et al., 2018; Pan et al., 2015) showed that anxiety in hypertensive individuals can worsen disease outcomes by increasing blood pressure, disrupting

medication adherence, and reducing overall functional status (Priasmoro et al., 2024). Several studies have shown a reciprocal relationship between hypertension and anxiety, where symptoms of hypertension such as chest tightness, dizziness, and headaches can trigger anxiety, which can worsen blood pressure through activation of the sympathetic nervous system (Lim et al., 2021).

Furthermore, mental health problems such as sleep disturbances and depressive symptoms are common in this population and have been found to interact with anxiety in complex ways (Ma et al., 2024). However, most of this evidence comes from high-income or non-Asian countries. Limited empirical data are available from low- and middle-income countries such as Indonesia, where unique cultural, social, and health system factors may influence the manifestation and

management of anxiety in elderly hypertensive patients. Indonesia's national health policy emphasizes the importance of healthy aging and the integration of mental health into primary care (Ministry of Health of the Republic of Indonesia, 2020). However, there is a lack of large-scale, population-based studies measuring the burden of anxiety among older adults with hypertension in Indonesia or exploring factors associated with its occurrence (Mills et al., 2020).

Khasanah et al. (2024) emphasized that the 2023 Indonesian Health Survey (SKI) provided a valuable opportunity to analyze this relationship using a nationally representative sample. This study aimed to determine the prevalence and investigate associations with demographic, social, and health factors in older adults with hypertension. Specifically, this study demonstrated how variables such as gender, age, marital status, residence, education level, employment status, sleep quality, and emotional well-being were associated with the presence of anxiety symptoms (Asri et al., 2024). The results of this study are expected to support the development of more integrated public health strategies in managing hypertension and mental health in older adults.

METHODS

Data Sources and Study Design

This study uses secondary data from the 2023 Indonesian Health Survey (SKI), a national cross-sectional survey conducted by the Ministry of Health of the Republic of Indonesia. The 2023 SKI used a stratified, multistage sampling design to collect health data from households across all provinces in Indonesia. The dataset includes demographic, socioeconomic, health behavior, and clinical information.

Study Population

The study population consisted of individuals aged 60 years and older identified as having hypertension, based on a previous physician diagnosis or current use of antihypertensive medications. From the original SKI dataset, a total of 20,865 older adults with hypertension were included in the final analytical sample after applying inclusion and exclusion criteria.

Inclusion and Exclusion Criteria

Inclusion criteria: Age \geq 60 years. Diagnosed with hypertension or currently taking antihypertensive medication. Complete responses to anxiety-related variables and all covariates of interest. Exclusion criteria: Individuals with missing anxiety data. Respondents with incomplete demographic or health data.

Variables and Measurement

In this study, anxiety was measured as a binary variable (yes/no) based on

respondents' reports of feelings of anxiety or worry occurring in the past 30 days. Anxiety was defined as feelings of worry that interfered with daily activities. Respondents were considered to have anxiety if they reported feeling anxious almost every day during that period, as measured by the question: "Have you felt anxious almost every day in the past 30 days?"

Insomnia was also measured as a binary variable (yes/no), defined as sleep disturbance occurring at least three times a week during the past 30 days. Insomnia is defined as difficulty falling asleep that impacts sleep quality and causes daytime fatigue. Insomnia was measured by asking: Do you have difficulty falling asleep or waking up at night at least three times a week? Age: Categorized into three groups (60–69, 70–79, and 80–112 years). Gender: Male or Female. Marital Status: Single, Married, or Divorced. Residence: Urban or Rural. Education: None, Elementary School, Middle School, High School, or College.

Statistical Analysis

Data analysis was performed using IBM SPSS Statistics version 27. Descriptive statistics were used to summarize the distribution of all variables. Bivariate relationships between anxiety and independent variables were evaluated using the chi-square test of independence.

To account for the complex survey design, which includes stratification, clustering, and unequal selection probability, sampling weights were applied to the dataset, ensuring more accurate and representative values. A p-value <0.05 was considered statistically significant.

Ethical Approval

This research was conducted in accordance with ethical guidelines and data privacy regulations. This study was approved through a formal data access request supported by a confidentiality agreement (No. FRM/SMKI-PUSDATIN/70/0108/2024), with approval ticket number 240675B7CC9C4327. All data from the Center for Health Information and Statistics were anonymized prior to analysis. Public access to the SKI data request process and consent documents is available at: <https://www.badankebijakan.kemkes.go.id/data-mikro-ski/>

RESULTS

Table 1 shows the frequency distribution of demographic and psychosocial characteristics of 20,865 elderly people with hypertension. Most participants were aged 60–69 years (65.2%), followed by 70–79 years (28.0%), and ≥80 years (6.8%). Women outnumbered men (61.1% vs. 38.9%). Most were married (62.5%), 36.4% were

divorced, and 1.1% were single. Most participants lived in urban areas (60.9%) rather than rural areas (39.1%).

Table 1. Frequency Distribution of Characteristics in Elderly with Hypertension (n=20,865)

| Variables | Frequency (n) | Percentage (%) |
|-----------------------|---------------|----------------|
| Age (Years) | | |
| Young Elderly (60-69) | 13,607 | 65.2 |
| Middle-aged (70-79) | 5,840 | 28.0 |
| Old Elderly (80-112) | 1,418 | 6.8 |
| Gender | | |
| Man | 8,123 | 38.9 |
| Woman | 12,742 | 61.1 |
| Marital status | | |
| Single | 221 | 1.1 |
| Marry | 13,043 | 62.5 |
| Divorce | 7,601 | 36.4 |
| Level of education | | |
| None | 5,003 | 24.0 |
| Elementary school | 8,313 | 39.8 |
| Junior high school | 2,437 | 11.7 |
| Senior High School | 3,246 | 15.6 |
| College | 1,866 | 8.9 |
| Work | | |
| Doesn't work | 8,752 | 41.9 |
| Work | 12,113 | 58.1 |
| Residence | | |
| Urban | 12,713 | 60.9 |
| Rural | 8,152 | 39.1 |
| Insomnia | | |
| Yes | 3,571 | 17.1 |
| No | 17,294 | 82.9 |
| Feeling Unhappy | | |
| Yes | 433 | 2.0 |
| No | 20,432 | 95.7 |

Regarding education, elementary school was the most common (39.8%), followed by no formal education (24.0%), high school (15.6%), junior high school (11.7%), and college (8.9%). More than half of the respondents were employed

(58.1%). Insomnia was reported by 17.1% of respondents, while only 2.0% reported feeling unhappy.

Table 2 shows the chi-square correlation between participant characteristics and anxiety among 20,865 hypertensive older adults (overall anxiety prevalence: 4.5%, n = 951). There was no significant correlation for age ($p = 0.124$); anxiety was reported by 2.8% of participants aged 60–69 years (n = 591), 1.4% of participants aged 70–79 years (n = 291), and 0.3% of participants aged ≥ 80 years (n = 69). Gender was significantly associated with anxiety ($p = 0.001$), with a higher prevalence in women than in men (3.1% vs. 1.4%). Marital status was also associated ($p = 0.024$), with anxiety most common in married (2.7%) and divorced (1.8%) participants, and lowest in single (0.0%). Place of residence was not associated with anxiety (urban 2.7% vs. rural 1.8%; $p = 0.521$). Education showed a statistically significant gradient ($p = 0.007$): anxiety was more common among those with no schooling (1.3%) or primary education (1.7%) and decreased with higher levels of education, reaching 0.3% among participants with a college education. Employment status was statistically associated with anxiety ($p = 0.001$), although the proportion was similar among those unemployed and employed (both 2.3%).

Table 2. Chi-squared analysis (n=20,865)

| Variables | Anxiety | | p-value |
|---------------------------|------------------|------------------|---------|
| | Yes [n(%)] | No [n(%)] | |
| Age (Years) | | | 0.124 |
| Young Elderly (60-69) | 591 (2.8) | 13,016 (62.4) | |
| Middle-aged (70- 79) | 291 (1.4) 69 | 5,549 (26.6) | |
| Old Elderly (80-112) | (0.3) | 1,349 (6.5) | |
| Gender | | | 0.001* |
| Man | 299 (1.4) | 7,824 (37.5) | |
| Woman | 652 (3.1) | 12,090 (57.9) | |
| Marital status | | | 0.024 |
| Single | 9 (0.0) | 212 (1.0) | |
| Marry | 556 (2.7) | 12,487 (59.8) | |
| Divorce | 386 (1.8) | 7,215 (34.6) | |
| Level of education | | | 0.007 |
| None | 263 (1.3) | 4,740 (22.7) | |
| Elementary school | 365 (1.7) | 7,948 (38.1) | |
| Junior high school | 117 (0.9) | 320 (1.1) | |
| Senior High School | 146 (0.7) | 3,100 (14.9) | |
| College | 60 (0.3) | 1,806 (8.7) | |
| Work | | | 0.001* |
| Doesn't work | 476 (2,3) | 8,276 (39.7) | |
| Work | 475 (2,3) | 11,638 (55.8) | |
| Residence | | | 0.521 |
| Urban | 570 (2.7) 381 | 12,143 (58.2) | |
| Rural | (1.8) | 7,771 (32.7) | |
| Insomnia | | | 0.001* |
| Yes | 612 (2.9) | 2,959 (14.2) | |
| No | 339 (1.6) | 16,955 (81.3) | |
| Feeling Unhappy | | | 0.001* |
| Yes | 191 (0.9) | 242 (1,2) | |
| No | 760 (3,6%) | 19,672 (94.3) | |

*p<0.05

Difficulty sleeping had a strong association with anxiety ($p = 0.001$): 2.9% of patients had insomnia versus 1.6% without insomnia. Feeling unhappy was also associated with anxiety ($p = 0.001$); notably, anxiety was 0.9% among those feeling unhappy and 3.6% among those not feeling unhappy, suggesting possible differences in symptom perception or reporting.

DISCUSSION

This study investigated the prevalence and sociodemographic factors associated with anxiety in elderly individuals with hypertension using data from the 2023 Indonesian Health Survey. The results showed that anxiety was significantly associated with gender, marital status, education level, employment status, sleep disturbance, and feelings of unhappiness. These findings provide important insights into the psychosocial dimensions of hypertension management in the elderly (Rizki et al., 2024).

Consistent with previous research, female gender was significantly associated with a higher prevalence of anxiety (Ma et al., 2024). This may reflect differences in hormonal, psychological, and social experiences between men and women in old age. Furthermore, divorced individuals reported significantly higher levels of anxiety compared to married or single

individuals, reinforcing the finding that social support and friendship may act as protective factors against mental disorders in the elderly population (Pizova & Pizov, 2023).

Sleep disturbances were among the strongest predictors of anxiety in our sample, in line with previous studies highlighting sleep disturbances as a critical risk factor for poor quality of life and increased psychological symptoms in hypertensive patients (Uchmanowicz et al., 2019; Zagaria & Ballesio, 2024). Similarly, self-reported feelings of unhappiness were significantly associated with anxiety, indicating the importance of subjective emotional well-being as a risk marker (Farhadi, 2018)

Mookerjee et al. (2023) confirmed that the prevalence of anxiety was higher among those with lower levels of education and those who were unemployed, in line with previous evidence that socio-economic disadvantage can exacerbate psychological disorders and reduce resilience among hypertensive older adults (Ma et al., 2024).

In contrast, place of residence and age did not show a significant association with anxiety, which may reflect different cultural or systemic factors in Indonesia compared to other countries (Ghasemi et al., 2024).

This study has several limitations. The cross-sectional design limits the ability to draw causal conclusions between hypertension and anxiety. Self-reported measures are susceptible to recall bias and social desirability, particularly regarding mental health. Furthermore, unmeasured factors such as medication use, comorbidities, and access to healthcare were not considered in the analysis.

Using a binary classification for anxiety may oversimplify the complexity of this disorder, which varies in severity and symptoms. These findings underscore the importance of integrating mental health screening into the management of chronic disease in older adults. Public health policies should target modifiable factors, such as sleep quality, social support, and economic empowerment. Tailored psychosocial interventions, including CBT, mindfulness, and ACT, can be adapted for older adults with hypertension in resource-limited settings (Versteeg et al., 2022).

CONCLUSION

In conclusion, improving mental health in older adults with hypertension is crucial for improving quality of life and treatment adherence. Our findings highlight anxiety as a common and modifiable problem in this population group. Routine screening for anxiety, along with assessment of sleep difficulties, should be

integrated into primary and cardiovascular care, with clear referral pathways to brief psychological interventions psychological education and CBT based counseling, sleep hygiene support, and community programs. Policies that strengthen patient centered multidisciplinary care and expand access to mental health services for older adults are urgently needed. Future longitudinal and interventional studies are needed to clarify causal pathways and test integrated care models aimed at reducing anxiety and improving cardiovascular outcomes.

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DATA AVAILABILITY STATEMENT

The dataset analyzed in this study was obtained from the 2023 Indonesian Health Survey (SKI), managed by the

Ministry of Health of the Republic of Indonesia. Access to this dataset is restricted and requires a formal request and approval from the Ministry of Health to ensure compliance with national data governance policies and participant confidentiality regulations. Interested researchers can submit a formal data request through the Ministry of Health's official data repository at the following link:

<https://www.badankebijakan.kemkes.go.id/data-mikro-ski/>.

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