

Correlational Study on Anxiety Levels and Sleep Quality in Older Adult People with Chronic Pain

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ABSTRACT

OBJECTIVE: Researchers recently conducted a study to understand this issue better, analyzing anxiety levels and sleep quality in 343 older adult individuals with chronic pain in Aceh.

METHODOLOGY: The study was a correlation study with a cross-sectional study design. To gather data, we conducted guided interviews with 343 participants from Banda Aceh using purposive sampling techniques who met specific criteria. The selection criteria included age 60 years or above, chronic diseases, and pain lasting over three months. Additionally, the participants had to be domiciled in Aceh, be able to read and write, have no severe cognitive impairment, and communicate effectively. The Geriatric Anxiety Scale (GAS) and the Pittsburgh Sleep Quality Index (PSQI) were used to gather reliable and valid data. Data were analyzed by using frequency distribution, percentage, and chi-square test.

RESULTS: Results indicated that 56% of the older adult participants experienced moderate anxiety levels, while 94.8% had poor sleep quality. Further analysis revealed a significant correlation between anxiety levels and sleep quality in older adults with chronic pain, with a P-value of 0.000.

CONCLUSION: Based on these findings, the study recommends that healthcare professionals provide counseling on anxiety and sleep quality at both community health centres and hospitals in Banda Aceh to alleviate anxiety and improve sleep quality among older adults with chronic pain.

KEYWORDS: Anxiety, Sleep Quality, Older Adult, Chronic Pain

INTRODUCTION

The population is aging rapidly, with Asia being the fastest-aging continent at 23%¹. In Indonesia alone, there are approximately 28 million elderly citizens¹, with 13,979 registered at the Banda Aceh city health office². As the percentage of elderly individuals increases, it will significantly impact various aspects of life, including health, economic, and social factors^{2,3}. The elderly population is particularly vulnerable due to health risk characteristics such as biological, age-related, socio-environmental, and behavioral or lifestyle risks⁴. They are susceptible to various physical and psychological difficulties, including musculoskeletal, respiratory, gastrointestinal, and cardiovascular problems⁵. Aging is a natural process that affects physiological functions progressively, leading to decreased physical function and leaving older people vulnerable to various diseases. Cardiovascular, respiratory, diabetic, and musculoskeletal changes are the most common

diseases experienced by older adults, resulting in chronic pain and disease burden⁵.

The prevalence of pain symptoms among older adults has increased, according to a systematic review⁶. Osteoarthritis is a common cause of pain, especially in the lower back or neck, ranging from 21% to 75% among older adults. Musculoskeletal pain is the second most common, affecting about 40%, followed by peripheral neuropathic pain caused by diabetes or postherpetic neuralgia at about 35% and chronic joint pain at about 15-25%. Arthritis pain, headache/stiffness, nociceptive pain, and neuropathy pain⁷ are the most common types of pain experienced by older adults. Chronic pain occurs in 25%-50% of the older adults living in rural areas and up to 80% in urban individuals⁸.

Age is vital in a person's pain due to degenerative diseases. European survey-based studies show that pain incidence increases with age, with prevalence estimates ranging from 38% to 60% in older adults over 65⁹. Persistent pain in older adults profoundly impacts the healthcare system's cost due to the complexity of treatment and worsening psychological conditions, such as anxiety (minimal, mild, medium, and severe) level, depression, insomnia, and poor quality of life⁹. Long-lasting pain is also a risk factor for death in older adults, exacerbating common problems such as cognitive deficits and lack of social interaction¹⁰; this can worsen their psychological condition and cause anxiety, depression, insomnia, and poor quality of life¹¹. Previous studies showed a significant relationship between anxiety and pain in

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older adults, with as much as 70% experiencing anxiety due to pain, interference from pain, severity of pain, limitation of movement, and lack of attention from their loved ones¹¹. These findings are also supported by the previous study, which showed that about 55.4% of the older adult experienced anxiety due to the persistence of treatment, the length of suffering, and the severity of their symptoms¹². Anxiety is an emotional state without an object that is associated with feelings of uncertainty that occur subjectively, which describes anxiety¹³. Symptoms of anxiety experienced by the older adult are feelings of irrational fear or worry, feelings of tension and irritability, fear of disease, and difficulty sleeping¹⁴. Proper sleep is characterized by sufficient duration, good quality, adequate timing, regularity, and the absence of sleep and other disorders¹⁵. However, disruption or lack of sleep duration in older adults can cause numerous adverse effects such as increased stress response, bodily pain, decreased quality of life, emotional stress, mood disorders, and cognitive memory deficits¹⁵⁻¹⁶. Moreover, insufficient or poor sleep quality has been linked to neurocognitive impairment, end-organ dysfunction, chronic health conditions, increased mortality, and other cardiometabolic consequences¹⁹. According to a previous study, 68% of sleep quality is closely related to levels of anxiety and depression²⁰. Similarly, another study found that poor sleep quality (67.3%) is closely related to one's environment, anxiety, chronic diseases, and lack of support from loved ones²¹. Two meta-analyses conducted by previous studies also found that short sleep duration increases the risk of hypertensive milk (23%), coronary heart disease (48%), stroke (15%), and type 2 diabetes (9%). Therefore, it is crucial to understand more about the correlation between anxiety levels and Sleep quality among older adults in Banda Aceh and gain a deeper understanding of the characteristics of the older adult population with chronic pain²².

METHODOLOGY

Study Design, Population, and Sample

The study was a correlation study with a cross-sectional study design. To gather data, we conducted guided interviews with 343 participants from Banda Aceh using purposive sampling techniques. The selection criteria included age 60 years or above, chronic diseases, and pain lasting over three months. Additionally, the participants had to be domiciled in Aceh, be able to read and write, have no severe cognitive impairment, and communicate effectively. This approach provided the researchers with detailed and comprehensive data on the specific population studied.

Instrument

The study employed three distinct instruments to collect data: a demographic questionnaire, the Geriatric Anxiety Scale (GAS), and the Pittsburgh

Sleep Quality Index (PSQI). The GAS comprises 30 questions, categorized into nine somatic items, eight cognitive items, eight affective items, and five general anxiety condition items. Participants were asked to rate their answers on a 4-point Likert scale ranging from 0 (not at all) to 3 (all the time). Higher scores on the scale indicated higher levels of anxiety. GAS has been declared valid and reliable, with the correlation coefficient value having a positive relationship with each GAS domain: somatic $r = 0.80$, cognitive $r = 0.90$, and affective $r = 0.82$ ²³. The Indonesian version has been tested for validity by a previous study using a face validity test whose aim is to assess whether the items in the questionnaire are capable and understood by respondents so that the results from the face validity test are 11 items whose language needs to be simplified and two items changed—the editorial. The reliability value of the Geriatric Anxiety Scale (GAS) questionnaire is perfect, with Cronbach alpha 0.9 in the bodily domain: $r = 0.86$; cognitive $r = 0.91$; affective $r = 0.92$ ²⁴.

The PSQI questionnaire consists of nine questions and evaluates seven different components of sleep quality. The first component assesses subjective sleep quality through a single item (item 9). Sleep latency is evaluated through items 2 and 5a, with scores ranging from 0 to 3. Sleep duration (item 4) is grouped into four categories: >7 hours = 0, 6-7 hours = 1, 5-6 hours = 2, and <5 hours = 3. Daily sleep efficiency (items 1, 3, 4) is determined by the duration and quality of sleep at night and in the morning, with scores grouped into four categories: >85% = 0, 75-84% = 1, 65-74% = 2, and <65% = 3. Sleep disorders (items 5b-5j) are rated based on their impact on sleep, with scores ranging from 0 to 3 and categorized as 0=0, 1-9=1, 10-18=2, and 19-27=3. The use of sleeping pills (item 7) is rated based on frequency of use: 0 = never, 1 = less than once a week, 2 = once or twice a week, and 3 = three or more times a week. Daytime dysfunction (items 8-9) is rated based on scores ranging from 0 to 3 and categorized as 0=0, 1-2=1, 3-4=2, 5-6=3. The scores of all seven components are combined to obtain a global score ranging from 0 to 21, which is then categorized as either good sleep quality (<5) or poor sleep quality (>5).

The Pittsburgh Sleep Quality Index (PSQI) has been declared valid and reliable with a Cronbach alpha value of 0.83 for the seven components, which will measure specific aspects of the overall sleep quality components. The most significant total component coefficient was obtained for the efficiency of sleep habits and subjective sleep quality, namely 0.76, and the smallest correlation coefficient value for sleep disorders was 0.35²⁵. The Indonesian version of the PSQI questionnaire has been tested for validity using product moment correlation techniques and Cronbach alpha tests with the program 54 Specificity results statistics of 86.5%. This questionnaire has been adapted as a data collection tool in research²⁶.

Data Analysis

The data collected underwent descriptive analysis techniques, including calculating frequency and percentage distributions for demographic, anxiety, and sleep quality data. This analysis aimed to understand better the characteristics of the older adult population with chronic pain. Inferential analysis using the Chi-Square Test (confidence level 95%, $\alpha=0.05$) was conducted to determine the correlation between anxiety levels and sleep quality. The p-value determines the correlation between Anxiety and Sleep Quality. If the p-value > 0.05, H_0 is accepted, indicating no correlation. If the p-value < or = 0.05, H_0 is rejected, meaning there is a correlation.

This analysis was instrumental in establishing whether there was a significant correlation between these two variables. The insights gathered from this study could prove invaluable in devising interventions to enhance the quality of life of older adults living with chronic pain.

Ethical Statement

The Ethical Committee on Health Research at the Faculty of Nursing Universitas Syiah Kuala has approved this study with reference number 111023031022. We conducted the survey following their guidelines. Before participants provided informed consent, we fully disclosed the study's nature, purpose, and potential benefits.

RESULTS

The majority of the participants in the study were female, comprising 62.4% of the sample. Additionally, the study found that 93.9% of the participants were between 60 and 74, with 131 individuals holding a high school education as their highest level. Regarding care, 42.9% of the older adult participants were cared for by their children, and 21.9% had a history of hypertension. The study also found that 58% of the older adult participants experienced psychological issues, such as feeling sad and depressed, though 70.3% maintained their interest in activities. The pain assessment revealed that 49.3% of participants reported mild pain. For a more detailed breakdown of the results, please refer to **Table I**.

Table I: Frequency Distribution of Older Adult Demographic Data (n= 343)

Socio-demographic	Frequency	Percentage
Gender		
Man	129	37.6
Woman	214	62.4
Age		
Elderly (61-74 years)	322	93.9
Older people (75-90 years)	21	6.1
Last education		
No school	39	11.4
Elementary school	52	15.2
Junior High School	81	23.6
Senior High School	131	38.2
College	40	11.7
Work		
Does not work	204	58.6
Self-employed	97	28.3

Retired	45	13.1
Religion		
Islam	295	86
Christian	18	5.2
Buddha	21	6.1
Hindu	9	2.6
Marital status		
Marry	194	56.6
Not married yet	21	6.1
Divorced	26	7.6
Widow/Widower	102	29.7
Socioeconomic (BPS, 2015)		
No income		
Very low (<Rp. 1,000,000 per month)	184	53.6
Low (Rp. 1,500,000 per month)	69	20.1
Medium (Rp. 1,500,000 to Rp. 2,500,000 per month)	35	10.2
High (IDR 2,500,000 to IDR 3,500,000 per month)	32	9.3
23	6.7	
Live with whom		
Live alone	21	6.1
Living with partner	151	44.0
Live with children	147	42.9
Living with relatives	24	7
Often feel sad and depressed		
No	144	42
Yes	199	58
Often loses interest in doing things		
No	241	70.3
Yes	102	29.7
Primary Caregiver		
Partner	127	37
Child	173	50.4
Relatives	43	12.5
History of illness		
Diabetes mellitus	65	19
Hypertension	75	21.9
Urinary tract infection	10	2.9
Hearing and vision impairment	25	7.3
Arthritis	66	19.2
Heart disease	10	2.9
Strokes	8	2.3
Gout	45	13.1
Cholesterol	39	11.4
Medical drug		
None	176	51.3
Metformine	64	18.6
Amlodipine	68	19.8
Piroxicam	34	9.9
Suffering from illness for a long time		
< 1 Year	23	6.7
25 years	114	33.2
6-10 Years	159	46.4
11-20 Years	26	7.6
20 Years	21	6.1
Consuming coffee		
No	203	59.2
Yes	140	40.8
Mini-COG>3		
Iyes	343	100
Pain assessment		
Light	169	49.3
Currently	145	42.3
Heavy	29	8.5

Level of Anxiety among Older Adults with Chronic Pain

Table II categorizes the anxiety levels of 343 older adult individuals with chronic pain based on somatic, cognitive, and affective symptoms. The data provides valuable insights into the different anxiety levels experienced by the respondents.

Sleep quality of Older Adults with chronic pain

Sleep quality data for 343 Older adults in Baiturrahman Sub-District, Banda Aceh, shows that good sleep is vital for good health. Those who reported good sleep had better physical and mental health, improved cognitive function, and higher productivity levels than those who did not. Good quality sleep is crucial for maintaining a healthy lifestyle (**Table III**).

Correlation between anxiety levels with sleep quality in Older Adults with chronic pain

A bivariate analysis explored the correlation between anxiety levels and sleep quality in older adult patients with chronic pain residing in Baiturrahman Sub-District, Banda Aceh. The analysis employed a computerized 3x2 contingency table using a significance level of $\alpha=0.05$. The null hypothesis (H_0) is rejected if the p-value is less than 0.05. The statistical data analysis outcomes are detailed in **Table IV**.

Table II: Level of Anxiety in Older Adults with Chronic Pain (n=343)

Anxiety Level	Frequency	Percentage
Minimal	0	0.0
Mild	83	24.2
Medium	192	56.0
Severe	68	19.8

Table III: Sleep Quality of Older Adults with Chronic Pain (n= 343)

Sleep Quality	Frequency	Percentage
Good	18	5.2
Bad	325	94.8

Table IV: Correlation between Anxiety Levels with Sleep Quality in Older Adults with Chronic Pain (n= 343)

Anxiety Level	Sleep Quality						a	P- value
	Good		Bad		Total			
	f	%	F	%	f	%		
Mild	9	10.8	74	89.1	83	100		
Medium	7	3.6	185	96.4	192	100	0.05	0.000
Severe	2	2.9	66	97.1	68	100		
Total	18	100	325	100	343	100		

DISCUSSION

The study's results indicated that a significant number of the 343 older adult respondents with chronic pain experienced anxiety, with 56% reporting moderate levels and 19.8% experiencing severe anxiety or panic. Additionally, 96.4% of respondents reported moderate anxiety and poor sleep quality. The Chi-Square test revealed a relationship between anxiety levels and sleep quality, with a p-value of 0.00. These findings are consistent with previous research, which reported anxiety levels in 52.4% of older individuals²⁷. The study suggests that chronic disease factors impacting sleep quality may cause anxiety in older adults. Other research also found a significant association between higher pain and anxiety levels and poor sleep quality in older adults²⁸. Furthermore, pain affects sleep quality in older adults mainly through anxiety symptoms.

A recent study found that 87% of older adults who experience pain also experience poor sleep quality²⁹. Pain can be an early indicator of sleep disorders, which can worsen pain conditions, particularly in those with chronic pain. Similar research discovered that anxiety in older adults is directly linked to decreased sleep quality, with around half of those with degenerative diseases experiencing difficulty falling and staying asleep, leading to insomnia and affecting their concentration, cognitive abilities, and quality of life¹⁶. Furthermore, insufficient sleep has far-reaching consequences on older adults' physical and mental health, as sleep plays a critical role in regulating the inflammatory response. Poor or short sleep quality can increase systemic inflammation, which can have various adverse health impacts³⁰.

Anxiety is a prevalent emotion that individuals often experience, characterized by uncertain feelings of isolation, helplessness, and insecurity²⁹. Its severity can vary depending on a person's emotional state and experience. It can be triggered by several factors, including biological, environmental, psychological history, family, and threats to integrity and self-systems³⁰; for older adults with insomnia, anxiety, and depression are possible underlying issues that can affect their physical health and quality of life. Therefore, managing anxiety is crucial to achieving healthy aging²⁹.

A recent study found that most respondents (42.9%) were cared for by their children, with many becoming responsible for their family's daily needs. Among the 204 respondents (58.6%) who did not have a job, the average economic status was not high (53.6%). This statistic is noteworthy and increases the likelihood of anxiety in older adults since financial issues can contribute to anxiety. The GAS questionnaire study discovered that 37.3% of respondents are always worried about their finances, even though they feel like a burden to their children. This result aligns with research by Santhalingam, who found a link between socioeconomic levels and anxiety in older adults³⁴.

Anxiety is a prevalent concern for older adult adults, often associated with chronic physical illnesses and negative emotions like pain and loneliness. Those who experience anxiety may struggle to concentrate, feel lightheaded or faint, and experience physical symptoms such as nausea or diarrhea when concerned. Ultimately, this can result in debilitating pain³⁵. This observation aligns with previous research, demonstrating that anxiety can appear in various forms³⁶. Respondents may feel affective symptoms, such as anxiety, tension, fear, impatience, helplessness, numbness, shame, and guilt. Cognitive symptoms. Such as forgetfulness, difficulty concentrating, errors in judgment, and a sensation of losing control may also be present. Symptoms such as a racing heart, difficulty breathing, and abdominal pain can lead to muscle tension, increased blood pressure, insomnia, and sleep difficulties³⁷.

Many older adults have difficulty initiating and maintaining sound sleep, with 42.9% and 41.7% facing challenges in falling and starting to sleep, respectively. The use of medical drugs and caffeine consumption were identified as contributing factors to the poor quality of sleep. A significant number of respondents (59.2%) reported consuming coffee, which contains caffeine that can disrupt sleep patterns. A previous study noted a correlation between coffee consumption and sleep disorder symptoms in older adults³⁸. The findings indicated that 84.3% of the respondents faced moderate sleep disorders, and 15.7% experienced severe sleep disorders. Although coffee consumption was identified as a contributing factor, other factors could also affect the quality and duration of sleep in older adults.

This study revealed that hypertension was the most prevalent medical condition, affecting 21.9% of the respondents, or 75 individuals. Hypertension can lead to heightened anxiety levels, particularly in older adults³⁹. Additionally, hypertension can impede daily activities, lower quality of life, and increase healthcare expenses. Tragically, it is also a significant contributing factor to high mortality rates. Qiu et al. found that anxiety disorders were more frequent in hypertensive patients (37.9%) than in older adults without hypertension (12.4%). Furthermore, hypertension can disrupt the sleep patterns of older adults⁴⁰.

Arthritis and joint pain can significantly impact the quality of sleep in older adults, lowering their quality of life. Symptoms include stiffness, limited mobility, swelling, and intense joint pain⁴¹. This chronic pain can be severe in older adults, causing them to wake up during the night and feel tired during the day. Studies show a significant link between pain intensity and sleep quality in patients with low back pain⁴². Joint pain can significantly impact the sleep quality of older adults, with 19.2% of respondents experiencing

joint pain. Simple and familiar vocabulary has been used to ensure an easy flow of information, and the text has been organized logically, with the most critical information mentioned first.

Aside from joint pain, Diabetes Mellitus (DM) is a prevalent disease among older adults that can cause discomfort and reduce their quality of life. The use of medical drugs can also affect sleep quality. Of 176 respondents, 51.3% do not use medical drugs, 48.3% use them, with 64 using anti-hyperglycemic drugs. These drugs are used to lower glucose levels, and metformin is widely used. However, it has side effects, such as gastrointestinal disorders like nausea⁴³.

DM patients often experience symptoms such as polyuria or urination retention, which occurs more frequently. Data from the field indicates that roughly 59.5% of respondents experience sleep disorders. Although anti-hypertensive drugs are used daily among older adults with DM, it is also used by those who experience hypertension. Specifically, 19.8 or 68 respondents reported using Amlodipine. However, research found that 45% of respondents reported side effects from using Amlodipine drugs⁴⁴. Through interviews, some respondents reported frequent dizziness, lightheadedness, chest pain, dyspnea, nausea, vomiting, palpitations, and frequent urination. Typically, Amlodipine drug administration is combined with Thiazide Diuretics, which inhibits the reabsorption of sodium and chloride ions from the tubules. This results in more water being removed, the heart working slower to pump blood throughout the body, and a decrease in blood pressure⁴⁵.

A significant concern is the high anxiety and poor sleep quality among older adults with chronic pain in Baiturrahman Sub-District, Banda Aceh. Studies indicate that 56% of respondents experience moderate anxiety levels, which can cause physical, emotional, and cognitive impairments and hinder daily activities. In addition, almost all respondents had poor sleep quality, with 94.8% reporting difficulties falling asleep, staying asleep, and waking up too early. These factors can lead to fatigue, irritability, and difficulty concentrating. To address this issue, healthcare workers must take immediate action to raise awareness and provide education about anxiety and sleep quality to older adults during visits to posbindu, puskesmas, and hospitals. Include providing information on relaxation techniques, sleep hygiene, and other coping strategies to manage anxiety. Additionally, family members can support their loved ones by creating a peaceful and comfortable environment, encouraging regular exercise and healthy eating habits, and engaging in social activities.

CONCLUSION

The study revealed that 192 (56%) older adults

experience moderate anxiety levels, while 325 (94.8%) have poor sleep quality. The data analysis indicated a significant correlation between anxiety levels and sleep quality in older adults with chronic pain (P-value = 0.000). In summary, anxiety and poor sleep quality are substantial problems among older adults with chronic pain in Baiturrahman Sub-District, Banda Aceh. To enhance the quality of life for older adults with chronic pain, healthcare professionals must educate them on anxiety management and proper sleep habits. Such education can take place during visits to healthcare facilities. Moreover, family support is crucial in serving as a support system for older adults. By working together, healthcare workers and family members can provide education and support to improve older adults' physical and psychological well-being, allowing them to enjoy their golden years to the fullest.

Ethical permission: The Ethical Committee on Health Research at the Faculty of Nursing Universitas Syiah Kuala Indonesia has approved this study with reference number 111023031022.

Conflict of Interest: No competing interests are stated by the authors in the study.

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Data Sharing Statement: The corresponding author can provide the data proving the findings of this study on request. Privacy or ethical restrictions bound us from sharing the data publically.

AUTHORS CONTRIBUTION

Nurhasanah N: Responsible for writing, collecting data, researching the concept, and developing the article.

Juanita J: Identify the supporting articles related to the manuscript, gather data, and analyze the data.

Putra A: Reviewing concepts, translating and proofreading the manuscript, and editing the articles.

All authors have verified the final version of the manuscript.

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