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The Correlation of Pain Intensity and Sleep Quality in the Elderly

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ABSTRACT

Increasing age causes the elderly to experience biological, physical, psychological and social changes, these changes affect all aspects of life, including their health, one of which is pain. Pain impacts the quality of sleep. Sleep quality affects physical and psychological aspects, namely fatigue, anxiety, irritability, disturbed concentration, stress which can increase the risk of suicide. The purpose of this study was to determine the relationship between pain intensity and quality of sleep for the elderly at Tresna Wherda Social. The research design used in this study was a cross sectional approach. The population in this study were all elderly people in January 2023, namely 80 people. The sample size as many as 66 people. The sampling technique was of purposive sampling. Data collection on pain intensity used the Visual Analog Scale (VAS) questionnaire, and sleep quality used the Pittsburgh Sleep Quality Index (PSQI). Data analysis using Spearman Rank. The results that most of the elderly had mild pain intensity (51.5%), the quality of sleep for the elderly was mostly good (80.3%), and there was a relationship between pain intensity and quality of sleep in the elderly with p-value = 0.012 with a correlation coefficient = 0.309 (medium). The results of this research can become a source and knowledge that can add insight in dealing with elderly people with pain and sleep disorders who are in the information community and special groups.

Keywords: pain intensity; sleep quality; elderly

Background

Elderly residents are those aged 60 years and over. The elderly population is expected to triple and is expected to account for more than 20% of the world's population by 2050 (1). The life expectancy (AHH) of the Indonesian population according to BPS has increased by 0.1 year compared to the previous year, namely 73.5 years in 2021 (2). Beberapa masalah dapat mempengaruhi kesehatan dan kesejahteraan lansia, salah satunya adalah nyeri.

The population of elderly aged 60 years and over in Indonesia is 10.8% or around 29.3 million people according to BPS 2021. This group accounts for 11.01% of Indonesia's total population of 273.88 million people. The prevalence of elderly people is 11.3 million (37.48%) aged 60-64 years, 7.77 million (25.77%) aged 65-69 years, 5.1 million (16.94%) aged 70-74 years, and 5.98 million (19.81%) were over 75 years old (3).

Pain is a multidimensional, complex and unpleasant feeling that occurs due to tissue damage, originates from nociceptive and neuropathic signals, predicts possible physiological danger and is influenced by psychosocial factors and the person's past experiences. Previous

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research has shown that as many as 50% of older adults living in the community and 45% - 80% of those living in nursing homes suffer from this problem. At any age, pain impacts an individual's life, but the effects may be greater in older adults compared to younger adults (4). The prevalence of pain increases as older adults age. Increased pain, prevalence increases with increasing age. Increasing age causes elderly people to experience biological, physical, psychological and social changes, these changes have an impact on all aspects of life, including their health.

In a study conducted by Ozel et al, it was determined that elderly people experienced the least knee pain (64.6%), headaches (58.5%), and back pain (7.3%). In another study, it was found that 74.2% -78.2% of elderly people experienced joint pain (4).

The main pain complaints in the elderly are related to neurodegenerative and musculoskeletal conditions, peripheral vascular disease, arthritis, and osteoarthritis, which contribute to poor quality of life, social isolation, impaired physical activity, and dependence to carry out daily activities. Organ dysfunction and other existing diseases can significantly influence the perception and response to chronic pain in this group. Older adults have an altered experience of pain, with changes in pain processing mechanisms, which may be related to degeneration of circuits that modulate descending pain inhibitory pathways. Aging is also associated with increased pain threshold, decreased pain sensation, and decreased pain tolerance (5).

Quality sleep is feeling refreshed and ready to face another life after waking up. This idea combines several attributes, for example, the time it takes to start falling asleep, the depth of rest and calm. Sleep complaints are common in older adults with chronic pain. Elderly people need a longer duration to enter the sleep phase (lying for a long time before falling asleep) and a shorter period of deep sleep. Changes in sleep patterns can be part of the normal aging process. However, many of these disorders may be related to pathological processes that are not considered a normal part of aging (6). A study showed that the prevalence of sleep disorders occurred at the age of <64 years at 56.1% and at >65 years at 43.9%; in males it was 35.7% and in females it was 64.3% (7). Other research shows that the majority (78.8%) of elderly people have poor sleep quality (8). One study analyzed survey responses from 4201 adults aged ≥65 years with a diagnosis of back pain, osteoarthritis, and/or rheumatoid arthritis, and at least 1 year of ongoing treatment and medical plan enrollment. The most frequently reported sleep outcome was short sleep duration (39%), followed by poor sleep quality (22%), and long sleep duration (9%) (9). General health status is likely related to sleep and pain.

Based on a preliminary study conducted at the Tresna Wherda Tulungagung Social Home, there were 80 elderly people living in the home. According to information from officers, of the 10 people studied, 4 people complained of sleep disturbances because their joints were painful for various causes, including a history of injury and high uric acid. From health examinations on 10 people by elderly officers, there were 5 people with high uric acid levels, and 2 people had a history of falls, so they complained of pain in the injured area. Several factors are associated with events that disrupt the sleep quality of the elderly. Sleep disorders are the most common complaint experienced by patients with lower back pain and primary headaches. Increased pain intensity can result in increased sleep disturbances, such as poor sleep quality (10).

Sleep disorders and pain often occur together, especially in the elderly. Although the relationship between sleep and pain is complex and not fully understood, mounting evidence suggests a bidirectional relationship between sleep and pain. Both problems have been found for older adults (suggesting that a common physiological system may underlie sleep disturbances and pain). Average pain intensity has been shown to be associated with sleep disturbances for older adults. Although the relationship between pain and sleep is strong in older adults, the relationship is inconsistent. This gap in knowledge is relevant given that pain

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inconsistency can be a debilitating factor for individuals experiencing pain and may shed light on the relationship between pain and sleep (11).

The impacts that arise due to poor sleep quality are: elderly people are unable to restore their physical condition properly, which causes feelings of weakness, dizziness, drowsiness and fatigue. Apart from that, the psychological impacts of poor sleep quality include feelings of anxiety, irritability, disturbed concentration, and stress which can increase the risk of suicide. With poor sleep quality, elderly people can experience changes in functional performance which will affect their relationships with other people in social aspects (12). Poor sleep quality can have profound physical effects on older adults, including fatigue and an increased risk of falls. These effects threaten mobility and independence. Poor sleep quality and sleep deprivation are also associated with effects on activities of daily living and cognitive impairment in the elderly. Additionally, both are significantly associated with psychological problems, mood swings, and depression. Previous studies have shown that supportive ties and close relationships among family members are positively associated with good sleep quality, whereas hostile ties predict poor sleep quality (13). The elderly need to receive special attention so that they can live as productively as possible according to their abilities (14).

Although research has been conducted to examine the relationship between chronic pain and sleep problems in the general adult population, research on the relationship between chronic pain and sleep problems in older adults is lacking. Studies in older adults have primarily addressed specific pain locations such as knee pain or knee arthritis in relation to sleep difficulties. Sleep disturbances in relation to pain severity and multisite pain problems in older populations have not been studied (15). So researchers are interested in knowing the relationship between pain intensity and sleep quality in the elderly.

Methods

The research design used in this study is correlational with a cross sectional approach, namely research that emphasizes measuring/observing data on independent and dependent variables only once at a time. Pain intensity and sleep quality in the elderly at the Tresna Wherda Social Home (PSTW) Tulungagung were measured 1 time. The population in this study were all elderly people at the Tresna Wherda Social Home (PSTW) Tulungagung in January 2023, namely 80 people. The samples in this study were some elderly people who lived at the Tresna Werdha Tulungagung Social Home with inclusion criteria: No dementia, no severe hearing loss that could interfere with communication with researchers. The sample in this study was a number of elderly people at the Tresna Wherda Social Home (PSTW) Tulungagung in January 2023, a total of 66 people determined using the lameshaw formula. The independent variable in this study was pain intensity. The dependent variable is the sleep quality of the elderly. Demographic data was collected using a questionnaire, to measure pain intensity using the Visual Analogue Scale (VAS) and to measure sleep quality using the Pittsburgh Sleep Quality Index (PSQI). Sleep quality is a score obtained from respondents who have answered questions on the Pittsburgh Sleep Quality Index (PSQI), which consists of 7 (seven) components, namely subjective sleep quality, sleep latency, sleep duration, daily sleep efficiency, disturbances sleep, use of sleeping pills, and daytime activity dysfunction. Each component has a value range of 0 – 3 with 0 indicating no difficulty sleeping and 3 indicating severe difficulty sleeping. The scores from the seven components are added up to become 1 (one) global score with a value range of 0 – 21. Both instruments were not tested for validity and reliability because they are both standard questionnaires and have been tested for validity and reliability. This research has passed the ethical test at KEPK Stikes Ganesha Husada Kediri with Number: 05/SGH/KEPK/V/2023.

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Results

Table 1. Characteristics of Respondents

No	Characteristics of Respondents	Frequency	Percentage (%)
1	Gender		
	Man	27	40,9
	Woman	39	59,1
2	Age		
	Late adulthood	1	1,5
	Early old age	1	1,5
	Late old age	3	4,5
	Elderly	61	92,4
3	Nutritional status based on BMI		
	Very thin	3	4,5
	Thin	1	1,5
	Normal	37	56,1
	Fat	12	18,2
	Very fat	13	19,7
4	Health Complaints		
	No complaints	11	16,7
	1 complaint	27	40,9
	2 complaints	20	30,3
	3 complaints	6	9,1
	4 complaints	2	3,0
5	Blood pressure		
	Hypotension	1	1,5
	Normal	45	68,2
	Hipertensi	20	30,3

Based on table 1 above, it is known that more than half of the respondents are female, namely 59.1%, 61% are elderly (> 65 years), more than half have normal nutritional status, namely 56.1%, most respondents have 1 health complaint felt was 40.9%, and the majority had normal blood pressure, namely 68.2%.

Table 2. Pain Intensity

Pain Intensity	Frequency	Percentage (%)
No pain	15	22,7
Mild pain	34	51,5
Moderate pain	12	18,2
Severe pain	5	7,6

Based on table 2 above, it is known that the highest intensity of pain in elderly people is mild pain at 51.5%.

Table 3 Sleep Quality

Sleep Quality	Frequency	Percentage (%)
Good	53	80,3
Bad	13	19,7

Based on table 3 above, it is known that the majority of elderly people's sleep quality is good at 80.3%.

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Tabel 1 Hasil Uji Analisis Data Penelitian Dengan *Spearman Rank*

Pain Intensity	Sleep Quality		Total
	Good	Bad	
No. Pain	15	0	15
Mild Pain	27	7	34
Moderate Pain	8	4	12
Severe Pain	3	2	5
Total	53	13	66
p-value= 0,012 with a correlation coefficient of 0,309			

Based on the results of statistical tests using SPSS Version 26.0, it shows that there is a relationship between pain intensity and the quality of life of the elderly with p-value=0.012 with a strength of relationship of 0.309 (sufficient).

Discussion

Pain intensity in the elderly at the Tresna Wherda Social Home Tulungagung

Most of the pain felt by the elderly is chronic pain. This pain affects a large proportion of the population causing functional disability, which is often associated with accompanying psychological disorders, such as depression and anxiety, in addition to cognitive deficits, and sleep disorders. The main pain complaints in the elderly are related to neurodegenerative and musculoskeletal conditions, peripheral vascular disease, arthritis, and osteoarthritis, which contribute to poor quality of life, social isolation, impaired physical activity, and dependence in carrying out daily activities. Organ dysfunction and other existing diseases can significantly influence the perception and response to chronic pain in this group. It has been suggested that older adults have an altered experience of pain, with changes in pain processing mechanisms, which may be related to degeneration of circuits that modulate descending pain inhibitory pathways. Aging is also associated with increased pain threshold, decreased pain sensation, and decreased pain tolerance(5).

One of the most common conditions causing chronic pain and disability in older adults is osteoarthritis. This may be related to the burden of obesity, combined with the aging of connective tissue during aging, which can cause painful changes during activity or rest (16). This opinion is in line with research results which show that 83.3% of elderly people have perceived health complaints and only 16.7% of elderly people have no health complaints. Health complaints felt by the elderly contribute to the intensity of pain felt. One of the complaints felt is osteoarthritis. Crostab results showed that 15 people (22.7%) experienced mild pain, while 4 people (22.7%) experienced severe pain, while 4 people (0.6%) experienced severe pain with 2 and 3 health complaints.

Age is an important factor that influences a person's pain (17). Elderly people will face stress such as painful sensations, chronic diseases, limited movement and decreased vision and hearing function. In this study, the majority of elderly people in the elderly category were 92.4%, 50% of elderly people experienced mild pain, 15.15% had moderate pain and 0.6% had severe pain.

Nutritional status is related to the intensity of pain felt. Based on the crosstabulation results, it shows that 4 elderly people with nutritional status of fat and very fat experienced severe pain (0.6%). Based on the results of the narrative review, there is a relationship between obesity and knee pain in elderly people with osteoarthritis, seen from the fact that when walking, half of the body weight rests on the knee joints, which will increase the load on the

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knee joints (18).

The highest intensity of pain in elderly people is mild pain at 51.5%. Pain experienced by the elderly, especially pain in the joints, is generally caused by lack of movement of the joints resulting in ankylosis or stiffness caused by the joining of the bones in the joints, and fatigue due to high to moderate activity. Research at Posyandu Melati RW 07, Mugassari Village, Semarang City shows that the elderly have a high intensity of activity, for example: some still work as traveling traders, manual workers and entrepreneurs because to meet their needs the elderly have to work(19). Meanwhile, in this study, according to officers, most of the elderly were less active when there were joint activities carried out at PSTW. Most of them prefer a sedentary lifestyle, even though they are still strong.

Sleep quality for the elderly at the Tresna Wherda Social Home (PSTW) Tulungagung

Sleep problems have become the most common complaint among the elderly. There are few studies exploring the prevalence of poor sleep quality and associated factors among elderly people in nursing homes. The prevalence of poor sleep quality in elderly people in nursing homes is relatively high. In addition, anxiety symptoms had additional interactions with age, chronic illness, and social support on poor sleep quality (20). The research results are not in line with this research, research shows that the majority of elderly people's sleep quality is good, namely 80.3% and only 19.7% have poor sleep quality. This gap is due to the fact that in this study elderly people were older, had chronic illnesses, symptoms of depression, symptoms of anxiety and lower levels of social support, whereas in this study, according to PSTW officers, the majority of elderly people did not experience psychosocial problems such as anxiety. Another study in Birjand, Iran, showed that elderly people had relatively good sleep quality. The most important factors contributing to their sleep quality are gender, pain, exposure to environmental stimuli, regular physical activity, and menopause-related problems (21).

Previous research has demonstrated many factors are associated with poor sleep quality in older adults, including but not limited to the following four domains: (1) socio-demographic factors, such as age; (2) lifestyle factors, such as physical activity (6,22). This research is in line with the results of this study, which showed that there were 11 elderly people (16.6%) with poor sleep quality, 7 elderly people with chronic diseases such as hypertension (10.6%) and elderly people with several health complaints. poor sleep quality.

Relationship between pain intensity and sleep quality in the elderly at the Tresna Wherda Social Home

The results of the research show that there is a relationship between pain intensity and sleep quality in the elderly at PSTW Blitar Tulungagung dormitory, with a p-value = 0.012 and a correlation coefficient of = 0.309, which means the relationship is of medium strength. A study showed that poor sleep quality coexists with chronic pain (OR = 2.05, 95% CI 1.04–4.05) (23). The intensity and type of pain can interfere with a person's ability to sleep comfortably. Uncontrolled chronic or acute pain can make it difficult to sleep, wake up in the middle of the night, or feel disturbed in sleep.

Elderly people who suffer from pain have significantly lower sleep quality. Persistent pain, reduces the quality of sleep by preventing people from falling asleep or falling into deep sleep. The association between pain and sleep quality was even stronger among women, particularly among those with fibromyalgia and emotional disorders such as depression and anxiety. However, prospective micro-longitudinal studies support that sleep disturbances are stronger and more severe predictors of acceptable pain than pain is sleep disturbances. Therefore, sleep disturbances may increase the risk of chronic pain among painless patients and worsen the prognosis of existing headaches and chronic musculoskeletal pain. Similarly, another study assessed the effects of restricting sleep to four hours per night for twelve

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consecutive nights and reported spontaneous body aches (21).

Conclusion and Recommendations

Most of the elderly had mild pain intensity (51.5%). The sleep quality of the elderly was mostly good (80.3%). There was a relationship between pain intensity and sleep quality in the elderly at PSTW Tulungagung with p-value=0.012 with a correlation coefficient=0.309 (medium). The higher the pain intensity, the worse the sleep quality score. For the community, the results of this research are expected to be a source of information and knowledge that can increase insight in treating elderly people with pain and sleep disorders in the community. For the Tresna Wherda Social Home (PSTW), it is hoped that the results of this research can be a source of reference, input/information for nurses, PSTW managers, the government and community service departments, especially in preparing interventions for pain and sleep disorders so that they are right on target. For future researchers, this research can be a reference and basic data reference for further research on similar problems or other research related to the elderly and produce information that is useful for science, especially in the field of public health.

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