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Effectiveness of Acupressure on Improving Sleep Quality of The Elderly

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Abstract
Sleep disorders increase with age, with prevalence approaching 50% in the elderly (65 years and above). In Indonesia, about 30% of the elderly experience sleep disorders. Several studies have shown that older people who have poor sleep patterns or who experience sleep disorders are at risk of dementia, mental illness, including anxiety and depression, hypertension, and cardiovascular disease. Sleep disorders can be treated with medication, but it can cause side effects such as drowsiness, poor concentration, and dementia. These side effects contribute to the risk of falls, accidents, and cognitive impairment. So to avoid these effects, a non-pharmacological approach can be taken, one of which is acupressure. Acupressure is the application of finger or thumb pressure on acupoints. This study aims to determine the effectiveness of acupressure on sleep quality in the elderly. The research used quantitative methods with a quasi-experimental research design. This design has a comparison group (control) and an intervention/treatment group, but before being given treatment (intervention), a pretest and posttest are carried out. The number of samples in this study amounted to 96 respondents, with the sampling technique used being purposive sampling. 96 respondents will be divided into control groups and intervention groups. The statistical analysis method used is the Wilcoxon test. The difference in the quality of elderly sleep before and after applying acupressure in the intervention group with an average (mean) of 0.479. As for the control group, -0.021. It can be seen that in the control group, there was an increase in value after applying acupressure. The p-value of the intervention group is 0.001 ($p < \alpha$), where it can be concluded that there is a real (significant) difference in the average improvement in the quality of elderly sleep as seen from the value of each assessment before and after acupressure is applied.

INTRODUCTION

Sleep disorders increase with age, with prevalence approaching 50% in the elderly (65 years and older) (Miner *et al*., 2016). In Indonesia, around 30% of the elderly experience sleep disorders (Sari & Leonard, 2018).

Several studies have shown that older people who have poor sleep patterns or who experience sleep disorders are at risk of dementia, mental illness including anxiety and depression, hypertension and cardiovascular disease (Shi *et al*, 2017; Hertenstein *et al*, 2019; Jarrin *et al*, 2018; Javaheri S, 2017). Sleep disorders themselves consist of various clinical conditions, such as difficulty initiating or maintaining sleep, excessive daytime sleepiness, and disturbances in sleep-wake patterns.

Sleep disorders can be treated with medication, but it can cause side effects such as drowsiness, poor concentration, and dementia. These side effects contribute to the risk of falls, accidents, and cognitive impairment (Ma *et al*., 2015). So to avoid these effects, a non-pharmacological approach can be taken, one of which is acupressure.

Acupressure is the application of finger or thumb pressure on acupoints (Hmwe et al, 2019; Chen *et al*, 2019; Chen *et al*, 2019). Some previous studies have shown that acupressure can improve sleep quality without causing side effects (Hmwe *et al*, 2019; Chen *et al*, 2019; Chen *et al*, 2019). Hmwe *et al* (2020) suggested that acupressure can help overcome sleep disorders in the elderly, so this contributes to reducing the negative impact of sleep disorders and the use of sleeping pills.

Research conducted by Indrayani *et al* (2021) shows that there is an effect of acupressure therapy on the quality of elderly sleep. This is in line with research conducted by Chen *et al* (2019), which explains that acupressure improves sleep quality, reduces psychological stress, and has a more beneficial effect.

The purpose of this study was to see the extent of the effect of acupressure on the quality of sleep of the elderly. Given that sleep is a basic need for every human being, and having good sleep quality will help the elderly in their activities and live their old age well and independently.

RESEARCH METHODS

The research method used is quantitative research using the quasi-experimental method. This design has a comparison group (control) and an intervention/treatment group, but before being given treatment (intervention), a pretest and posttest are carried out. Thus, the results of the treatment can be known more accurately because they can be compared with the situation before treatment (Sugiono, 2016). This design is described as follows:

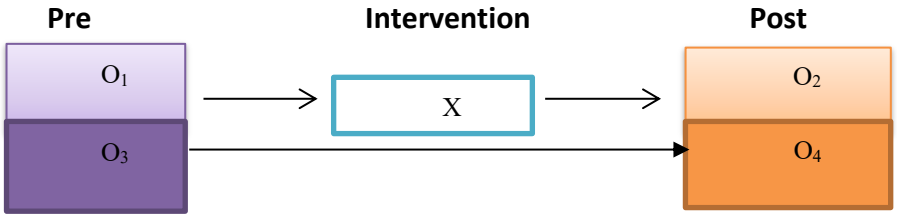

Figure 1. Experimental Design

The population in this study was all elderly people who are members of congregations in the Rumahtiga area, Ambon City. The elderly in question are individuals aged ≥60 years according to WHO criteria. Inclusion criteria included the elderly who were able to communicate verbally, did not experience severe cognitive impairment, were not undergoing pharmacological therapy for sleep disorders, and were willing to become participants through filling out an informed consent sheet. Exclusion criteria were elderly individuals with severe neurological disorders, extreme mobility limitations, and elderly who were undergoing active pharmacological treatment for sleep disorders during the intervention period.

The sample size was determined based on Lemeshow's formula for populations with unknown proportions. Based on this calculation, the minimum number of respondents

required in this study was 96 participants, who were then divided proportionally into two groups: 48 intervention group respondents and 48 control group respondents. The sampling technique used was purposive sampling, which is a sample selection method based on certain considerations relevant to the research objectives. This technique was chosen because this study required subjects with specific characteristics (e.g., age ≥60 years and mild to moderate sleep disturbance).

Data was collected through the use of the Pittsburgh Sleep Quality Index (PSQI) questionnaire. The PSQI is an internationally validated instrument used to measure a person's sleep quality within the past month. The PSQI consists of 19 items that measure seven components: subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, sleep medication use, and daytime dysfunction. Total scores range from 0 to 21; scores >5 indicate poor sleep quality.

The validity and reliability of the PSQI have been confirmed by various international studies with a Cronbach's alpha index >0.70, indicating high internal consistency. In this study, local language and context adjustments have been made to make the questionnaire relevant to the characteristics of Indonesian elderly respondents.

The intervention provided was acupressure therapy, which was carried out in accordance with the Standard Operating Procedure (SOP) for Acupressure Techniques. Acupressure is performed by researchers who have received special training in the field of complementary therapy, especially acupressure. The data obtained were analyzed bivariately using the Wilcoxon Signed Ranks Test to compare PSQI scores before and after the intervention in each group. The Wilcoxon test was chosen because the data were ordinal and not all data distributions met the assumption of normality. For testing differences between groups (intervention vs control), the Mann-Whitney U test was used as a non-parametric alternative to the independent t-test. The significance level was set at $\alpha = 0.05$, so a p-value <0.05 was interpreted as a statistically significant result.

RESULTS AND DISCUSSION

The results of statistical tests of the characteristics of respondents are shown in the table 1:

Table 1. Characteristics of Respondents

Characteristics	F	%
Gender		
Male	43	44,8
Female	53	55,2
Total	**96**	**100**
Age		
45-59 years old	20	20,8
60-69 years old	52	54,2
≥ 70 years old	24	25,0
Total	**96**	**100**
Educational level		
Not going to school	2	2,1

Primary school	5	5,2
Junior high school	9	9,4
Senior High School	31	32,3
Polytechnic/College	39	40,6
Graduate school/Doctor	10	10,4
Total	**96**	**100**
Occupation		
Unemployed	9	9,4
Housewife	11	11,5
Retired	22	22,9
Entrepreneur	31	32,3
Civil servant	8	8,3
Other (taxibike driver, fisherman, etc)	15	15,6
Total	**96**	**100**
Marital status		
Married	46	47,9
Single	5	5,2
Widow	24	25,0
Widow man	21	21,9
Total	**96**	**100**

Based on Table 1 above, it is known that the highest gender is female at 55.2%, with the highest age in the range of 60-69 years, 54.2%. The highest level of education is Polytechnic/College, as much as 40.6%, while the highest type of work is self-employed, namely 32.3%. The highest marital status is married, with a presentation of 47.9%, and most respondents live with family at 57.3%.

Table 2. Sleep Quality of the Intervention Group and the Control Group Elderly

Characteristics	F	%
Intervention group (pre-intervention)		
Good Sleep Quality	14	29,2
Poor Sleep Quality	34	70,8
Total	**48**	**100**
Intervention group (post-intervention)		
Good Sleep Quality	37	77,1
Poor Sleep Quality	11	22,9
Total	**48**	**100**
Control group (pre-intervention)		
Good Sleep Quality	11	22,9
Poor Sleep Quality	37	77,1
Total	**48**	**100**
Intervention group (post-intervention)		
Good Sleep Quality	10	20,8
Poor Sleep Quality	38	79,2
Total	**48**	**100**

Table 2 explains that in the intervention group, whose sleep quality was poor at 70.8%, after acupressure, the quality of sleep was good at 77.1%. Whereas in the control group, the highest pre-sleep quality was poor sleep quality, 77.1%, and post by 79.2%.

Table 3. Results of Differences in the Effect of Elderly Sleep Quality in the Intervention Group and Control Group

Variable	Mean	SD	95% CI	t	*P* Value
Intervention Group					
Pre dan Post	0,479	0,505	0,333 - 0,626	6,576	0,001
Control Group					
Pre dan Post	-0,021	0,325	-0,115 – 0,074	-0,443	0.659

Table 3 shows that the difference in elderly sleep quality before and after applying acupressure in the intervention group with an average (mean) of 0.479. As for the control group, -0.021. It can be seen that in the control group, there was an increase in value after applying acupressure. The p-value of the intervention group is 0.001 ($p < \alpha$), where it can be concluded that there is a real (significant) difference in the average improvement in the quality of elderly sleep as seen from the value of each assessment before and after acupressure is applied.

This study shows the effect of acupressure intervention on improving the quality of elderly sleep. This is supported by research by Dicer *et al* (2022), where the results of their research using the meta-analysis test explain that acupressure intervention is effective on the quality of elderly sleep, because acupressure affects sleep quality in the elderly by providing a relaxing effect and reducing symptoms of insomnia. This is in line with the opinion of Yoon and Hyeongyeong (2023), who suggest that acupressure is a good intervention option to overcome several problems faced by the elderly, such as relieving stress, depression, and anxiety, reducing salivary cortisol levels, and improving sleep quality. Acupressure affects sleep quality in the elderly by stimulating certain points, such as sympathetic points, which reduce stress and anxiety, promote relaxation, and regulate cortisol secretion, ultimately improving overall sleep quality and reducing insomnia symptoms. The same thing was also stated by Hmwe *et al* (2022) that the application of acupressure in the elderly can improve their sleep quality. This is because acupressure creates a more relaxed state that is conducive to better sleep.

Indrayani *et al* (2021) explained that acupressure is a therapy with the principle of healing touch that shows more caring behavior towards respondents. From a psychological aspect, acupressure can also help improve respondents' sleep quality. Most respondents stated that acupressure therapy could make them feel more cared for, calm, comfortable, and relaxed. The feeling of comfort, calmness, and relaxation in the elderly is the effect of acupressure. Stimulation of sensory nerve cells around the acupressure points will be forwarded to the spinal cord, then to the mesencephalon and hypothalamus-pituitary complex, all of which are activated to release endorphins that can provide a sense of calm. The same thing was stated by Das *et al* (2022) that acupressure therapy conducted for two weeks had a positive impact on the quality of sleep of the elderly.

Acupressure also stimulates the release of serotonin, which functions as a neurotransmitter carrying stimulation signals to the brain stem, which can activate the pineal gland to produce the hormone melatonin (Yoon and Hyeongyeong, 2023). This melatonin hormone can affect the suprachiasmatic nucleus (SCN) in the anterior hypothalamus of the brain in regulating circadian rhythms, resulting in decreased sleep latency, nocturnal awakening, and increased total sleep time and sleep quality (Dicer *et al*., 2022).

In Hmwe (2022), it is explained that acupressure is the stimulation of acupuncture points (acupoints) on meridian lines using finger or thumb pressure. The purpose of acupressure is to regulate the vital energy (known as Qi) that maintains one's health and well-being (Snyder, 2010). Manual stimulation of acupressure points helps to release muscle tension, improve blood circulation, and strengthen immunity (Snyder, 2010). From the perspective of Chinese medicine, health is considered to have a normal flow of vital energy and a balance between Yin and Yang. When Qi flows freely, the person is healthy and balanced. If Qi is insufficient or the normal movement of Qi is disrupted, dysfunction occurs, and then physical, emotional, and mental illnesses develop. In the condition of sleep disturbance, it is the result of internal disharmony in Qi flow, imbalance of Yin and Yang, and dysfunction of internal organs (Hmwe, 2022). The application of acupressure regulates the flow of Qi within the body or at specific organs, restoring good health and improving sleep (Snyder, 2010).

Stimulating acupressure points using finger or thumb pressure is a simple technique that is easy to learn. Nurses, caregivers, and even family members can learn basic acupressure techniques and apply acupressure for the elderly. Therefore, integration of acupressure in elderly care and clinical practice is feasible and can be beneficial to improve sleep.

CONCLUSION

Based on research that has been conducted on 96 respondents, the data processing process can be briefly described that there are significant changes before and after the application of acupressure. So it can be concluded that acupressure improves the quality of elderly sleep. Based on the above conclusions, the suggestion that can be conveyed is that the application of acupressure needs to be applied to every individual who has sleep disorders, because it can help improve sleep quality. Furthermore, the results of this study can be used as a reference in the development of complementary therapies as part of nursing care interventions.

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