

ISSN 2354-8428  
e-ISSN 2598-8727

JURNAL KEPERAWATAN

# KOMPREHENSIF

COMPREHENSIVE NURSING JOURNAL

**Published by :**

**Sekolah Tinggi Ilmu Keperawatan  
PPNI Jawa Barat**

Vol. 10 No. 3, July 2024



JURNAL KEPERAWATAN KOMPREHENSIF	VOL. 10	NO. 3	Bandung July 2024	ISSN 2354-8428	e-ISSN 2598-8727
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## Research Article

# Effect of Lavender Aromatherapy Combination and Earplug Use on Sleep Quality of Critically Patients

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Received : 20/06/2024

Revised : 27/07/2024

Accepted : 28/07/2024

Online : 29/07/2024

Published : 29/07/2024

### Abstract

**Aims:** Critically ill patients' severe symptoms and higher mortality risk can impact sleep quality. Non-pharmacological therapy, including lavender aromatherapy and earplugs, can improve sleep quality in these patients. To determine the effect of the combination of lavender aromatherapy and the use of earplugs on sleep quality in critically ill patients.

**Methods:** This study uses a Quasy Experiment design with a one-group pretest-posttest design, involving 33 participants aged 18-65, with The Richards-Campbell Sleep Questionnaire, and uses Paired Sample t-Test for data processing.

**Results:** In this study, an overview of the sleep quality of critical patients showed an improvement. An analysis of the sleep quality of critically ill individuals revealed a notable enhancement. The study found a significant improvement in sleep quality after the lavender aromatherapy intervention and the use of earplugs in the intervention group, as indicated by a p-value of 0.001 ( $p < 0.05$ ).

**Conclusion:** The findings of this study indicate that the use of lavender aromatherapy intervention with earplugs can positively impact the sleep quality of critically ill patients. Furthermore, nurses can independently use lavender aromatherapy and earplug use as crucial nursing treatments.

### Keywords:

**Aromatherapy, Critical Patients, Earplug, Sleep Quality**

## INTRODUCTION

Sleep is a loss of consciousness and response that occurs naturally, periodically, and Reversible against external stimuli. Normal human sleep consists of four to six blocks of 90-100 minute cycles between sleeps Non-Rapid Eye Movement and Rapid Eye Movement (REM), and the total sleep duration is 7-8 hours/night (1). Poor sleep quality is associated with decreased immune function and susceptibility to disease and infection, decreased energy levels, delirium, delayed recovery, and impaired cognitive, respiratory, heart, and endocrine functions (2).

In accordance with the decree issued by the Minister of Health in 1778/MENKES/SK/XII/2010, the Intensive Care Unit (ICU) is a component of an independent hospital that falls under the supervision of the director of services. It is equipped with specialized personnel and equipment dedicated to the observation, treatment, and therapy of patients who are afflicted with diseases, injuries, or complications, as well as patients who are experiencing life-threatening or potentially life-threatening complications (3). HCU is a medical service for patients with needs that require treatment, treatment and observation

strictly with a service level that is between the ICU and the inpatient room (does not require ICU treatment but cannot be treated in the usual treatment room because it requires strict observation) (Decree of the Minister of Health 834/MENKES/SK/VII/2010). Classification of critical patients: patients with priority 1 are unstable critical patients who require intensive and titrated therapy, priority 2 patients require advanced monitoring services in the ICU and priority 3 patients are critical patients who have unstable previous health status, with underlying diseases, or acute diseases alone or in combination (Decree of the Minister of Health 1778/MENKES/SK/XII/2010).

The World Health Organization (WHO) reports that the number of critically ill patients who are admitted to intensive care units may be on the rise annually. There was an increase of 1.1-7.4 million persons globally who passed away as a result of critical to chronic diseases, and it was discovered that 9.8-24.6% of critical patients were admitted to the intensive care unit for every 100,000 inhabitants. The fact that there are around four million patients in intensive care units in Indonesia each year, according to the Minister of Health 1778/MENKES/SK/XII/2010), can make this a significantly problematic situation (4). Pharmacological treatment is commonly used to treat sleep disorders, sleep-inducing drugs to calm and relieve pain and are mostly used in intensive care. Various non-pharmacological interventions have been used in improving sleep quality in ICU patients. Complementary therapies (e.g., music therapy, aromatherapy, massage, integrated imagination, acupuncture), environmental interventions (e.g., noise reduction) (5). Complementary medicine is known as a low-risk, inexpensive, simple and low-side treatment method that is being developed around the world, especially in developing countries (6). Nursing interventions that can be done are lavender aromatherapy and the use of earplugs.

The drug diazepam It is known to reduce the impact of external emotional cues by raising the number of  $\gamma$ -aminobutyric neurons in the amygdala that include inhibitory neurons that contain acid (7,8). It is believed that lavender can increase the effects of diazepam. Interacting with the cerebral cortex and having an effect on the heart rate, blood pressure, breathing, stress levels, and hormone levels, the limbic system is responsible for the sedative and relaxation effects that it produces. After careful consideration, it was decided that one of the interventions that will be carried out in this study will be the application of lavender aromatherapy (9).

As per the rules provided by the World Health Organization (WHO), the noise level in the hospital area where the patient is being treated or monitored should not exceed 35 A-weighted decibels (dBA). Furthermore, the maximum noise level during the nighttime should be 40 dBA in order to guarantee that the patient is able to get sufficient sleep. The average noise levels in intensive care units were estimated to be between 53 and 59 decibels, whereas the peak noise levels were between 67 and 68 decibels (10). One of them is the use of earplugs, which is a non-pharmacological intervention that can be administered to patients in order to limit the amount of noise they are exposed to while they are receiving therapy. The manipulation of hormones that regulate cardiac rhythms, such as cortisol and melatonin, is the physiological basis for the use of earplugs to improve the quality of sleep. (11).

Based on research (12), stated that lavender aromatherapy has an influence on improving the sleep quality of patients in the ICU, related to the use of lavender and peppermint therapy in the journal (6) showed an improvement in the quality of sleep of heart patients who were being treated in CCU, and according to a study (13), the administration of lavender aromatherapy intervention can significantly improve sleep quality. About use earplugs deep (14) to achieve positive outcomes and

improve sleep quality in cardiac patients in CCU, Research (2) also get results from using earplugs in ICU care. Getting positive results that can improve sleep quality.

Based on the explanation above, it is important for researchers to conduct a study entitled "The Effect of Lavender Aromatherapy Combination and Earplug Use on Sleep Quality in Critical Patients", with the aim of finding out how lavender aromatherapy combined with earplugs improves sleep quality.

## METHODS

This research received permission from the Research Ethics Committee of the PPNI College of Nursing West Java, with reference number No. III/020/KEPK-SLE/STIKEP/PPNI/JABAR/V/2023. This research method uses a pre-experiment with a one

group pretest-posttest design. The population in this study is critical patients at Purwakarta Hospital with an average population of critical patients in the ICU and HCU rooms for one month ranging from 25-35 patients. The sampling technique that has been used in this study uses Accidental sampling. The independent variables of this study were lavender aromatherapy and the use of earplugs. The dependent variable of this study is sleep quality. Data analysis using Paired Sample t-Test.

## RESULTS

This study was conducted for 1-2 months from May 19 to June 30, 2023 with a sample of 33 respondents in this study. The characteristics of the respondents in this study include age, gender and education level.

**Table 1. Test Results Based on Age, Gender and Education**

Characteristic	Intervention (n=11)	Percentage (%)
Age		
18-25	3	9.1
26-35	0	0
36-45	6	18.2
46-55	3	9.1
56-65	21	63.6
Gender		
Woman	12	36.4
Man	21	63.6
Education		
SD	18	54.5
JUNIOR	3	9.1
SMA	12	36.4
Bachelor	0	0

Table 1 The age of respondents is more at the age of 56-65 years as many as 21 people. In gender data, the respondents were more male (63.6%) than female (36.4%). Education data shows that the education level of elementary school (SD) has six respondents (54.5%), which is more than junior high school (SMP) with one respondent (9.1%) and high school (SMA) with 12 respondents (36.4%).

**Table 2. Overview of the effect of lavender aromatherapy combination and earplug use on sleep quality of critically ill patients**

Group	N	Score	Min-Max	Mean $\pm$ SD
Intervention	33	Pretest	36-42	38.55 $\pm$ 1,968
		Posttest	76-79	77.18 $\pm$ 0.982

Table 2 seen from the results of the picture of improving the sleep quality of critical patients with a mean pretest value of 38.55 and a mean posttest value of 77.18.

**Table 3. Data Normality Test**

Shapiro-Wilk					
Group	N	Score	Statistics	Sig.	Result
Intervention	33	Pretest	0,909	0,238	Usual
		Posttest	0,896	0,165	Usual

Table 3 shows the results of the normality test with a normal distribution because the pretest and posttest values have a sig value.  $>0.05$ .

**Table 4. Overview of Sleep Quality Before and After Lavender Aromatherapy and Earplug Use**

Total Score Value	Mean $\pm$ SD	Mean Differences	95% CI		t	P value
			Lower	Upper		
Pretest	38.55 $\pm$ reviews	38,636	-39,389	-37,884	-114,406	0,001*
Posttest	77.18 $\pm$ 0.982					

Table 4 shows the effects before and after lavender aromatherapy intervention and earplug use.

## DISCUSSION

A total of 33 respondents showed demographic characteristics with more age at the age of 56-65 years. Age in this study had no relationship with sleep quality. This is in line with the theory (15) and (14) and Most of the respondents were male 7 people (63.6%) compared to 4 women (36.4%). In this study, gender had no relationship with the sleep quality of critical patients. This is because daytime sleepiness significantly affects the patient's sleep. In

accordance with research (16) which stated that there was no significant difference between sex and sleep quality. In the education data, the results of this study show that the majority of respondents' education is elementary school with a total of six people. The relationship between sleep quality and education shows no relationship. So in this study, education is not a factor that affects the quality of sleep of the respondents. This research is in line with the theory (17), (15) and (14) which states that education has no significant relationship with sleep quality.

The results of this study of the lavender aromatherapy combined administration



intervention and the use of earplugs to improve the quality of sleep of critical patients showed that the combination of interventions using lavender aromatherapy and earplugs had substantial effects on the quality of sleep that critical patients experienced (18,19). It is possible to learn these results by employing the test known as the Paired Sample t-Test. In the combination of lavender aromatherapy intervention and the utilization of lavender earplugs, the findings obtained showed a p-value of 0.001, which is less than the predetermined threshold of 0.05. This research is identical to the one that was conducted in (12), which was about the impact of aromatherapy on the quality of sleep and stress levels of patients in intensive care units. Further, this research is identical to the research that was conducted about the influence of earplugs and eye masks on the quality of sleep experienced by patients who were in the intensive care unit (20).

Lavender aromatherapy and the use of earplugs can improve sleep quality by modulating hormones that harmonize heart rhythm, cortisol and melatonin and lavender aromatherapy also provides a sedative and relaxing effect. So that this condition can affect the quality of sleep of patients who experience sleep disorders.

## CONCLUSION

Based on the results of the study, it can be concluded that the combination of lavender aromatherapy and the use of lavender aromatherapy earplugs can improve sleep quality in critically ill patients. For nursing services, it is hoped that the results of the study can be applied as one of the non-pharmacological interventions as environmental modification therapy to overcome the quality of critical patients. For the next researcher, they can conduct research on the effect of giving lavender aromatherapy combinations and the use of earplug, or compare the effects of both interventions and examine aspects other

than sleep quality. And it is hoped that the results of this research can become a new reference or library.

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