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The Impact of Murottal Therapy, Eye Masks, and Earplugs on Sleep Quality in Intensive Care Unit Patients at a Tertiary Hospital

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Abstract

Background: Patients in the ICU often experience poor sleep quality. The consequences of poor sleep quality include cognitive and mood disturbances, decreased immune function, and cardiovascular issues. Typically, pharmacological management for poor sleep quality involves the use of sedative medications. However, sedatives can cause side effect, such as altering sleep physiology and potentially prolonging mechanical ventilation. Therefore, additional non-pharmacological therapy is needed, such as combining murrotal therapy with the use of eye masks and earplugs this study aims to determine the impact of murottal therapy, eye masks, and earplugs on sleep quality in intensive care unit patients at a tertiary hospital.
Methods: The study utilized a pre-experimental design with a one-group pre-test and post-test approach. The sample consisted of 17 ICU patients at Dr. M. Djamil General Hospital in Padang, Indonesia selected through accidental sampling. Data were collected from May 6 to June 9, 2024, using the Richards-Campbell Sleep Questionnaire (RCSQ). Data analysis included both univariate and bivariate analysis, with the bivariate analysis conducted using the Paired T-Test.
Results: The results showed that the mean sleep quality score before and after the intervention was 32.59 and 78.00, respectively. There was a significant effect of combining murottal therapy with eye masks and earplugs on sleep quality in ICU patients ($P < 0.001$).
Conclusion: It is recommended that hospitals adopt the combination of murottal therapy with eye masks and earplugs as a standard procedure to enhance sleep quality in ICU patients.

Keywords: *earplug, eye mask, ICU, murottal, quality of sleep*

Introduction

Intensive Care Unit (ICU) is an independent hospital installation under the director of service, equipped with specialized staff and equipment designed for the observation, care, and treatment of patients suffering from disease, injuries, or complications that are life-threatening or potentially life-threatening with a dubious prognosis.[1] According to a report by the World Health Organization (WHO), 9.8-24.6% of critical patients were treated in ICUs per 100,000 population.[2] The Indonesia Ministry of Health reported that throughout 2021, 52,719 critical patients were treated in ICUs in Indonesia, with the number of ICU beds totaling 81,032 across 2,979 hospitals.[3]

ICU care provides specific diagnosis and management; close monitoring of vital functions; and vital assistance such as the use of ventilators.[1] Although ICU care offers specialized care and close monitoring, it is important to acknowledge that several issues often arise in patients treated in the ICU, including poor sleep quality, delirium, psychological problems, nutritional issues, nosocomial infections, and others.[4-8]

The quality of sleep among patients during treatment in the ICU is known to be poor.[9] Poor sleep quality is a significant issue for fully conscious patients receiving treatment in the ICU.[10] Sleep quality encompasses key factors contributing to patient satisfaction with sleep, such as sleep duration, time required to fall asleep, frequency of awakening, and subjective aspects like sleep depth and comfort.[11]

Poor sleep quality can decrease muscle endurance, cause delirium, weaken the immune response, and increase the risk of nosocomial infections.[9] Waruwu et al. (2019) conducted a study in the Intensive Care Unit (ICU) and found that a significant majority (83.3%) of critically ill patients experienced poor sleep quality.[12] Similarly, research conducted by Sari et al. (2021) revealed that nearly all patients (80.6%) experienced poor sleep quality[13] Two factors can contribute to poor sleep quality in ICU patients are environmental factors and biological factors. Environmental factors include interventions administered, noise, and excessive light, while biological factors encompass depression, anxiety, pain, medical conditions, and discomfort.[14]

Generally, the management of poor sleep quality in ICU patients involves pharmacological therapy using sedative or hypnotic drugs. However, these sedative drugs can cause several side effects, such as disrupting circadian rhythms and sleep phases.[6,15] Therefore, additional therapy is needed in the form of effective non-pharmacological interventions with minimal side effects to improve sleep quality in ICU patients. Stimulus control is one such non-pharmacological method designed to associate the bed with restful and efficient sleep. This approach involves habits such as using the bed only for sleeping and avoiding activities like reading, eating, or working in bed.[16] One way to implement stimulus control is by providing murottal therapy before sleep.

Murrotal therapy involves listening to the recitation of holy verses from the Qur'an. This therapy helps create a calm and soothing atmosphere around the bed, reinforcing the association between the bed and quality sleep. Additionally, murottal therapy can reduce stress hormones, activate natural endorphins, and promote relaxation. It also helps alleviate anxiety, redirect focus, and enhance rest and sleep in ICU patients.[17] Recent research found that the application of murotal Al-Quran is carried out using voice recordings played via MP3 and repeated for 15 minutes to provide a calming effect for patients. This repeated playback helps other sounds, divert attention, and has a hypnotic function that reduces brain wave activity, stimulating the production of serotonin and endorphins, which promote feelings of calm and comfort.[18]

Recent reserch has shown that combining two or more non-pharmacological interventions can improve sleep quality.[19] In addition to stimulus control, poor sleep quality in patients can be managed through sleep hygiene. Sleep hygiene consists of a series of practices and habits designed to create an optimal sleep environment and enhance sleep quality.[16] One aspect of sleep hygiene is environmental modification, which has been shown to improve both sleep quality and perceived cognition.[20] For example, reducing ambient light and noise has been found to significantly enhance sleep quality.[21]

Simple interventions such as wearing eye masks and earplugs at night, have also been shown to be beneficial for ICU patients. The use of eye masks and earplugs aims to reduce sensory disturbances that can interfere with sleep, such as bright light and loud noises, thereby helping individuals sleep better.[22] Recent research has found that the use of eye masks and earplugs can help reduce poor sleep quality in ICU patients.[23] Similarly a study by Younis found that eye masks and earplugs were effective in extending sleep duration and improving sleep quality in ICU patients. Based on the findings above, further research is needed to examine the impact of murottal therapy, eye masks, and earplugs on sleep quality in intensive care unit patients at a tertiary hospital.

Methods

Study Design

This study employed a quantitative research approach with a pre-experimental design, specifically using a one-group pre-test and post-test method. The study aimed to evaluate the effect of Murottal therapy, eye masks, and earplugs on sleep quality in ICU patients at Dr. M. Djamil General Hospital, Padang.

Population and Sampling

The population consisted of ICU patients at Dr. M. Djamil General Hospital, Padang. A total of 17 respondents were selected using accidental sampling. Participants were included in the study if they were 25-60 years old, Muslim, had a sleep quality score of ≤50 based on the Richards-Campbell Sleep Questionnaire (RCSQ), had a Glasgow Coma Score (GCS) of 15 indicating compos mentis consciousness, and were able to provide informed consent. Exclusion criteria included patients who were using or had been administered sleeping pills, those on mechanical ventilation, patients with brain damage or other neurological conditions as indicated in medical records, and those with mental disorders as noted in medical records.

Instrument and Data Collection

The Richards-Campbell Sleep Questionnaire (RCSQ) was used to assess sleep quality. Developed by Richards *et al* this instrument is specifically designed to measure sleep quality in critically ill patients.[24] It consists of five items, each measured using a 100 mm visual analog scale, assessing perceived sleep depth, sleep latency (time taken to fall asleep), number of awakenings, ability to return to sleep after waking, and overall sleep quality. The total RCSQ score is obtained by summing the five item scores and dividing the total by five. Sleep quality is classified into four categories: very poor (0-25), poor (26-50), good (51-75), and very good (76-100). The instrument demonstrated strong psychometric properties, with a validity test result of r = 0.714, confirming its suitability for ICU patients, and a reliability test Cronbach's alpha of 0.906 (>0.6), indicating good internal consistency. Data collection was conducted between May 6 and June 9, 2024.

Data Analysis

Both univariate and bivariate analyses were performed. Univariate analysis examined the characteristics of respondents, including mean, standard deviation, minimum, and maximum sleep quality scores before and after the intervention. Bivariate analysis assessed the effect of Murottal therapy, eye masks, and earplugs on sleep quality. A parametric test was then used, specifically the Paired T-Test, which showed a $P < 0.05$, confirming a significant improvement in sleep quality after the intervention in ICU patients.

Ethical Considerations

This study received ethical approval from the Ethics Committee of Dr. M. Djamil General Hospital under approval number DP.04.03/D.XVI.XI/213/2024

Results

The characteristics of respondents, including age, gender, education, length of stay, and medical diagnosis of patients in the ICU are presented in Table 1.

Table 1. Characteristics of respondents including age, gender, education, length of stay, and medical diagnosis of patients in the ICU at a tertiary hospital

	Mean	SD	f	%
Length of stay (days)	3.29	1.11		
Age (years)				
25 – 40			9	52.9
41 – 65			8	47.1
Gender				
Male			6	35.3
Female			11	64.7
Education				
Junior high school			1	5.9
Senior high school			13	76.5
Diploma/Bachelor			3	17.6
Medical Diagnosis				
Post Section Caesaria Transperitoneal			3	17.6

Post Insisi Drainage Abses			2	11.8
Post Laparascopi			3	17.6
Post Laparatomi			4	23.5
Video-Assisted Thoracoscopic Surgery			2	11.8
Post Thyroidectomy			2	11.8
Post Sternotomy			1	5.9

Table 1 shows that ICU patients at a tertiary hospital have an average length of stay 3.29 days. More than half of the patients are aged 25 – 40 years (52.9%), the majority are female (64.7%), and most have a senior high school (76,5%). Additionally, a small proportion of patients have a post-laparatomy medical diagnosis (23.5%).

The results of the bivariate analysis regarding the impact of using eye masks and earplugs on the sleep quality of ICU patients at a tertiary hospital are presented in Table 2.

Table 2. The effect of using eye masks and earplugs on the sleep quality of ICU patients at a tertiary hospital

Sleep quality	Mean	SD	Gain		95% CI		P-value
			Mean	SD	Lower	Upper	
Pre-test	32.59	7.13	45.41	7.24	41.69	49.13	< 0.001*[a]
Post-test	78.00	4.95					

* *P* < 0.05 considered significant

a. *Paired T-Test*

According to Table 2, the mean difference in sleep quality scores before and after receiving a combination of Murottal therapy, eye masks, and earplugs in the Intensive Care Unit of a tertiary hospital was 45.41. The results of the bivariate statistical analysis showed a P-value <0.001, indicating that this combination significantly improved the sleep quality of ICU patients at the tertiary hospital.

Discussions

The results of this study found that the combination of murottal therapy with the use of eyemasks and earplugs significantly affected the sleep quality of ICU patients at a tertiary. The patients in this study did not receive pharmacological therapy such as Alprazolam, meaning that the results are likely not influenced by pharmacological therapy. However, the findings cannot be directly compared to similar studies, as no previous research has combined murottal therapy with the use of eye masks and earplugs for managing poor sleep quality in ICU patients. Nonetheless, a previous study explained that combining two or more non-pharmacological interventions can improve sleep quality more effectively than using just one intervention.[19]

Several studies have investigated the effects of Murottal therapy and the use of eye masks and earplugs in managing poor sleep quality.[16,17] Some studies have found a significant impact of Murottal therapy on the sleep quality of ICU patients. Similarly, a study demonstrated that providing 15-30 minutes of Murottal Al-Qur'an therapy significantly improved the sleep quality of ICU patients.[22]

The murottal Al-Quran is implemented through MP3 voice recordings played for 15 minutes to promote peace for patients. This is because repeated playback can help block out other sounds, providing a distraction and having a hypnotic effect that reduces brain waves, which in turn can stimulare the production of serotonin and endorphins, promoting a sense of calm and comfort.[18] Physiologically, listening to the recitation of the Quran verses produces several medical and psychological effects, including balancing serotonin and norepinephrine levels in the body. These natural morphines, which act in the brain, help the heart and mind feel calm after listening.[23] Meanwhile, the use of eye masks and earplugs at night has also been shown to benefit for ICU patient. Eye masks and earplugs are designed to reduce sensory disturbances, such as bright light and loud noises, which can interfere with sleep, thereby helping individuals sleep better.[22]

Stimulus control is one of the non-pharmacological methods designed to associate the bed with sound and efficient sleep such as by providing murottal therapy. Murottal therapy is a therapy that uses the media of the Qur'an (listening or reading) to help in changes in the body that are specific both psychologically and physiologically.[21,22] Combining two or more non-pharmacological interventions can improve sleep quality better than just providing one non-pharmacological intervention. In addition to stimulus control, management of poor sleep quality in patients can be done with sleep hygiene.[19]

Sleep hygiene is a series of practices and habits designed to create an optimal sleep environment to improve sleep quality such as wearing eye masks and earplugs at night.[16] An eye mask is a small tool for covering the eyes that is worn or placed in front of the eyes. The eye mask is tied around the head with elastic rubber or thread made of black cloth so as to inhibit exposure to light in the eyes, coated with gel to provide comfort to the eyes. While earplugs are soft and flexible earplugs that adjust to the ear canal, the device is easy to install which can reduce noise by 15 - 30 dB, making it easier to start sleeping.

The application of a combination of murottal therapy with the use of eye masks and earplugs can not only improve the quality of sleep of ICU patients, in this study the patient's blood pressure and heart rate improved. The results showed that there was a difference in the average systolic and diastolic blood pressure of patients before and after being given a combination of murottal therapy with the use of eye masks and earplugs. The results of this study also found that there was a difference in the average heart rate of patients before and after being given a combination of murottal therapy with the use of eye masks and earplugs.

This study has several advantages compared to others, as it combines murottal therapy with the use of eye masks and earplugs. The combination of these therapies is more effective and faster in improving the sleep quality of ICU patients compared to providing only one non-pharmacological intervention. Administering murottal therapy before using eye masks and earplugs can help relax patient, making it easier for them to fall asleep. Additionally, the combination of murottal therapy and the use of eye masks and earplugs is a relatively inexpensive intervention to improve the sleep quality of ICU patients.

Despite its many advantages, this therapy also has some drawbacks that need to be considered during implementation. First, not all ICU patients may feel comfortable or be able to use eye masks and earplugs, especially those who are not accustomed to sleeping in a dark and quiet environment. Second, the response to murottal therapy can vary depending on the patient's cultural background and religious beliefs. Patients who are unfamiliar with or do not understand the recitation of the Quran may not experience the same relaxation effects as those who are accustomed to the therapy. Additionally, the limited duration of the intervention during ICU care is a limitation, as, although is appears effective in the short term, long term impact of this intervention has not been studied in depth. Another factor to consider is the influence of external factors that are difficult to control, such as interactions with medical staff, medical procedures performed at night, and the patient's health condition, which can change.

The implication of this study hospitals will consider providing murottal therapy along with the use of eye masks and earplugs to improve the sleep quality of ICU patients by preparing Standard Operating Procedures (SOP) that can be implemented gradually.

Conclusions

This study demonstrates that the combination of Murottal therapy, eye masks, and earplugs has a significant effect on the sleep quality of ICU patients in a tertiary hospital. Hospitals may consider incorporating this intervention to enhance patient sleep quality in the Intensive Care Unit by developing and implementing Standard Operating Procedures (SOPs) in a gradual and structured manner.

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Declarations of competing interest

No potential competing interest was reported by the authors.

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