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Penggunaan Earplugs dan Eye Masks untuk Meningkatkan Kualitas Tidur Pasien di ICU

The Use of Earplugs and Eye Masks to Improve Sleep Quality of Patients in the ICU

Ainnur Rahmanti[1], Dwi Mulianda[2]

[1,2] **STIKES Kesdam IV/Diponegoro, Semarang, Indonesia**

ABSTRACT

Sleep is an important step in the recovery process of patients in the ICU. Poor sleep quality is one of the events that prolongs the patient's stay in the ICU. Sleep disturbances in critically ill patients occur from the initial phase of treatment to the late stages of recovery for more than two decades. The causes of disturbances in the quality and quantity of sleep in critically ill patients are the patient's own illness, the effects of drugs, psychological factors, the environment, namely noise, lighting, patient and provider interactions. health services and treatment procedures. This study aimed to identify the difference of sleep quality on patients in the ICU after using earplugs and eyemasks. This study was quasi experiment study with nonequivalent control group design. Respondents in this study amounted to 15 patients treated in the ICU obtained from 30 samples of patients. This study states that 10-17% of the noise in the intensive care unit is at a level that causes patients to wake up and wake up from their sleep, namely the noise reaches 70dB and is mostly caused by communication between staff and patients or with others as well as television. The noise experienced by the patient can come from the bedsite monitor alarm, the infusion/syringe pump alarm, pulse oximetry, the voice of the officer's telephone, television, room telephone and ventilator alarm. The provision of a combination earplug and eye mask intervention to improve the quality of sleep of patients in the intensive room of Bhakti Wira Tamtama Hospital Semarang proved to be very significant, with a p value of 0.000. Recommendations for further research are that more in-depth interventions can be carried out by paying attention to other factors, namely the patient's condition, giving nursing interventions at night to the use of medications that affect the quality of sleep of patients in the intensive care unit.

ABSTRAK

Tidur merupakan tahapan penting dalam proses pemulihan pasien di ICU. Tidur yang tidak berkualitas merupakan salah satu peristiwa yang memperpanjang pasien dirawat di ICU. Gangguan tidur pada pasien kritis terjadi dari fase awal pengobatan sampai tahap akhir pemulihan hingga lebih dari dua dekade. Penyebab gangguan kualitas dan kuantitas tidur pada pasien kritis adalah penyakit pasien sendiri, efek dari obat, faktor psikologis, lingkungan yaitu kebisingan, pencahayaan, interaksi pasien dan penyedia pelayanan kesehatan serta prosedur perawatan. Penelitian ini bertujuan untuk melihat perbedaan kualitas tidur pada pasien yang dirawat di ICU setelah menggunakan earplugs dan eyemasks. Penelitian ini merupakan penelitian quasi experiment dengan nonequivalent control group design. Responden dalam penelitian ini berjumlah 15 orang pasien yang dirawat di ICU yang diperoleh dari 30 sampel. Pada penelitian ini menyatakan bahwa 10-17% suara di unit perawatan intensive berada pada tingkat yang menyebabkan pasien terbangun dan terjaga dari tidurnya, yaitu kebisingan mencapai 70dB dan sebagian besar disebabkan karena komunikasi antar petugas dan pasien atau dengan yang lainnya juga televisi. Bising yang dialami pasien dapat berasal dari alarm bedsite monitor alarm infuse /syringe pump, pulse oxymetri, suara telepon petugas, televise, telepon ruangan dan alarm ventilator. Pemberian intervensi kombinasi earplug dan eyemask untuk meningkatkan kualitas tidur pasien di ruang intensive RS Bhakti wira Tamtama Semarang terbukti sangat signifikan, dengan nilai p-value 0,000. Perlu pemberian intervensi yang lebih mendalam dengan memperhatikan faktor – faktor yang lain, yaitu berupa kondisi pasien, pemberian intervensi keperawatan saat malam hari hingga penggunaan medikasi yang mmepengaruhi kualitas tidur pasien saat di ruang intensif.

Keywords : *earplugs, eye masks, ICU, health, sleep quality.*

Kata Kunci :earplug, eye mask, ICU, kesehatan, kualitas tidur.

Correspondence : Ainnur Rahmanti
Email : ainnurrahmanti@gmail.com, 082336828588

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INTRODUCTION

Hospitalization is a healing effort, but it has some negative effects. One of the negative effects of hospitalization is the disruption of sleep needs. Patients treated in intensive care are those with critical conditions who undergo hospitalization, with complex diseases, and are susceptible to various stressors. Patients admitted to the ICU will experience problems during short hours of sleep and often wake up (Jue and Nathan-Roberts, 2019)

Poor sleep quality in critical patients, including patients with cardiovascular disorders, can have some negative impacts. Some of them are physiological disorders in the body, both in the form of cardiovascular stimulation, increased secretion of stomach acid, stimulation of the pituitary and adrenal glands, suppression of the immune system, slowing the wound healing process, and possibly causing delirium (Drouot and Quentin, 2016).

Rest and sleep are basic needs needed by everyone. Poor sleep quality in critical patients can have some negative effects. Some of these are physiological disorders in the body, both in the form of cardiovascular stimulation, increased gastric acid secretion, stimulation of the pituitary and adrenal disorders, suppression of the immune system, slowing down the wound healing process, and possibly causing delirium, agitation, confusion and psychosis (Johansson et al., 2012). Everyone needs adequate rest and sleep to function optimally. Adults need an average of 6-8 hours of sleep per day (Fadlilah et al., 2020), including people who are sick (Kozier et al., 2010). Patients who are treated in the Intensive Care Unit (ICU), are patients who experience impaired body functions that can threaten their lives with unstable conditions, very vulnerable to attacks or stressors, and also various kinds of problems, because patients usually experience more than one body system and the patient's own condition is difficult to predict (Wang and Greenberg, 2013).

Sleep is a basic need for all humans and especially for critically ill patients (Tirovaipati et al., 2019). It can help in the healing process (Jue and Nathan-Roberts, 2019). Patients treated in the ICU experience changes in their sleep patterns where patients experience short sleep hours so that patients have difficulty achieving REM and deep sleep, resulting in frequent awakenings. Critically, ill patients often experience sleep fragmentation (Kamdar et al., 2012), where the effects will affect immune function (e Silva et al., 2020; Ragnoli et al., 2022), metabolic system (Koren et al., 2016), central nervous system regulation (Medic et al., 2017), and psychological conditions (Anderson and Bradley, 2013). The fulfillment of sleep is very helpful in the process of integral homeostatic restoration. Lack of sleep can interfere with immune function, reduce the resistance of the respiratory muscles and can prolong the stay in the ICU (Robertson and Al-Haddad, 2013).

Sleep problems in critical patients will also increase cardiovascular function disorders, including coronary heart disease and stroke, the respiratory system can cause hypercapnia to hypoventilation, metabolic disorders will also appear, namely the occurrence of glucose tolerance, insulin release, growth hormone and cortisol secretion, appetite regulation (Romero-Bermejo, 2014). The study of patient experience in the intensive care unit as much as 12% stated that the time for sleeping and resting was too short. Night sleep is only experienced by 50% of respondents. The length of time the patient sleeps in intervals of 6 minutes to 13.3 hours a day. Sleep is dominated by stage 1 non-rapid eye movement (NREM) sleep, which at this stage is a transition from a conscious state.

Several factors that affect the quality of sleep of patients treated in the ICU are noise and lighting factors. A room with a noise level of more than 70dB can trigger vasoconstriction, increase heart rate, hypertension and even arrhythmias. Meanwhile, lighting around 30-50 lux can suppress melatonin and can affect sleep and biological rhythms (Hu et al., 2015). Patients who are treated in intensive care are patients with critical conditions, with complex diseases and are susceptible to various stressors. Patients admitted to the ICU will experience problems with short sleep hours and frequent awakenings. A person experiencing sleep deprivation has many neurobiological consequences. If in one night a person does not sleep, there will be a decrease in brain ability. The most noticeable change in behavior is looking sleepy. On the other hand, if sleep needs are met the following night, there will be a prolonged nighttime sleep, an increase in slow-wave sleep and an increase in REM sleep. According to the National Heart, Lung and Blood Institute (2011), sleep can provide the needed rest for the heart and cardiovascular system (Drouot and Quentin, 2016).

Sleep disturbances in the ICU are caused by many factors including noise, environment, lighting, nurse activities, illness, drug therapy, mechanical ventilation and nursing actions. The World Health Organization (WHO) has recommended that the average noise level in hospital wards should not exceed 30 dB (A) during the day or night, and peak noise should not exceed 40 dB (A) at night (Yazdannik et al., 2014). Unfortunately, most studies have shown that noise levels in the ICU are higher than these recommendations. In addition, continuous light exposure is another environmental factor that affects sleep in the ICU. Rays/lights play a vital role in synchronizing circadian rhythms.

To get adequate sleep quality, patients can be given both pharmacological and non-pharmacological treatment. The use of drugs in the ICU is known to interfere with the patient's sleep patterns and circadian patterns, which results in a decrease in sleep quality. Other complementary therapies can be used to help reduce sleep disturbances in patients in the ICU. An intervention is needed to reduce the factors that influence the

patient's sleep problems in the ICU, namely by using earplugs and eye masks (Yazdannik et al., 2014).

This study aims to determine the quality of sleep of patients in the ICU and the effect of using earplugs and eye masks on improving the quality of sleep of patients in the ICU. The research contribution is to provide theoretical and practical understanding of the importance of using earplugs and eye masks as an effort to improve the quality of sleep of patients in the ICU, so as to minimize all forms of complications caused and, in an effort, to improve the quality of life of patients treated in the ICU.

METHOD

The research design used in this study was a quasi-experimental approach with a Pretest and Posttest Control Group Design approach. Quasi Experiment method is an experimental research method using a control group. In this design, the research respondents were randomly divided into two groups. One group is the treatment group while the other is the control group (Nursalam, 2013). The number of respondents in this study were 15 intervention groups and 15 control groups.

This study was a quasi-experiment with non-equivalent control group design as many as 30 respondents were taken with purposive sampling which was then divided into intervention and control groups of 15 respondents each. Respondents in the study were admitted to the ICU. The intervention group was given intervention earplugs and eye masks when the lead-up to bedtime break began at 10 p.m. to 5 am (7 hours). Sleep quality was measured using the Richard Campbell Sleep Questionnaire (RSCQ) instrument and using a VAS (0-100mm) (Murata et al., 2019). This study had been approved by ethical committee at RST Dr. Soedjono Magelang with a decree No. 008/EC/I/2019.

To determine the quality of sleep in patients treated in the ICU. Subjective sleep quality was evaluated 1 to 2 days after transfer to the ICU, using the Chinese version of the Richards-Campbell sleep questionnaire (RCSQ). The original RCSQ had six points and evaluated aspects of sleep at night which included: (1) depth; (2) latency (time to sleep); (3) awakening frequency; (4) efficiency (percent time awake); (5) quality; and (6) noise received during the night as measured on a 100 mm visual-analogue scale (VAS).

The population in this study were patients who were treated in the ICU at Bhakti Wira Tamtama Hospital, Semarang. Inclusion criteria include: a). Composmentist awareness, b). Cooperative, communicative, c) Hemodynamically stable with systolic 100-130 mmHg, diastolic 60-100 mmHg and MAP >65 mmHg without using inotropes such as dopamine, epinephrine and norepinephrine, d). Mild and moderate pain scale (1-10), e) respondents without a ventilator or using a nasal cannula/NRM, and f) did not receive sleeping pills. Exclusion criteria: a). Respondents with restless condition, b). Respondents with skin problems around the eyes and ears.

Data was collected by explaining the research subjects, giving informed consent to prospective respondents, providing information about the aims and objectives of the study, randomly dividing the subjects into 2 groups, the control group and the intervention group and asking the respondents' consent with their signatures. the control group received routine care at night, and the intervention group received routine care plus eye patches and ear plugs. The intervention was given every night at 10.00 pm to 05.00 am (7 hours) from the inclusion of the patient until the patient was discharged from the ICU. A trained nurse performs the installation of the device. The earplug used in this study as made from soft foam that had the right size on the ears of adult patients, while the eye mask used was made of gel that could be given a cold or warm sensation in accordance with the patient's comfort level.

RESULTS

This research was conducted at Bhakti Wira Tamtama Hospital Semarang. Bhakti Wira Tamtama Hospital Semarang has an ICU room capacity of 8 patient beds consisting of 5 patient beds for adult patients and 3 patient beds for pediatric patients. The number of patients admitted to the ICU during January 2019-June 2019 was 179 patients with the highest average diagnosis including Hypertension, Diabetes Mellitus, AMI, SNH, CKD, CHF, DHF, Post SC, shock, and seizures. The results of univariate analysis describe the distribution of respondents based on age, sex, education, length of stay and diagnosis of disease.

The combination of giving earplugs and eye masks to patients in the ICU is given while the patient is hospitalized in the ICU, the intervention is carried out at night starting at 21.00 WIB until 05.00 WIB. Before and after the intervention, patients were assessed for both quality and comfort during sleep using the VAS (0-100 mm). During data collection, all patients in the intervention group received the same treatment, namely getting earplugs and eye masks at the same time. That is as many as 15 people underwent intervention and as many as 15 people also became the control group without giving intervention.

Table 1. Characteristics of Respondents in the Intervention Group and Control Group (n=30)

Variable	Group			
	Intervention (n=15)		Control (n=15)	
	f	%	f	%
Age				
<55 years old	4	27	3	20
55 years old	11	73	12	80
Gender				
Male	10	67	7	47
Woman	5	33	8	53
Length of Hospitalization				
< 3 days	12	80	10	67
> 3 days	3	30	5	33
Disease Diagnosis				
DM	4	27	5	33

Hypertension	11	73	8	54
Another case	-	-	2	13
Oxygen				
With breathing apparatus	13	87	14	93
No breathing apparatus	2	13	1	7

Table 1 shows that most of the respondents in the two groups are mostly male. Meanwhile, the average hospitalization for both the intervention and control groups was less than 3 days of treatment. The most cases that became respondents to this research were patients with a diagnosis of hypertension in the ICU Bhakti Wira Tamtama. During research and data sampling, most patients that were nursed were patients with hypertension and diabetes mellitus. Another case was patients with gastrointestinal disorder, that was patients with hematemesis melena and peritonitis.

Table 2. Average Sleep Quality of Respondents in the Intervention Group and Control Group (n=30)

Variable	(Mean ± SD)	95%CI
Control Group		
Pre-Test	32.27 ± 3.936	30.09 ± 34.45
Post Test	31.93 ± 3.081	30.23±33.64
Intervention Group		
Pre-Test	33.27 ± 3.788	31.17±35.36
Post Test	56,486 ± 5,486	53.30 ± 59.37

Table 2 shows that the average sleep quality in the control group before the intervention was 32.27 with a standard deviation of 3.936 and the average sleep quality after the intervention was 31.93 with a standard deviation of 3.081. Furthermore, the average quality of sleep in the intervention group before the intervention was 33.27 with a standard deviation of 3.788 and the average quality of sleep in the intervention group after the intervention was 56.486 with a standard deviation of 5.486.

Table 3. Analysis of Differences in Sleep Quality among Respondents in the Intervention Group and Control Group (n=30)

Variable	(Mean ± SD)	SE	*P value*
Control Group			
Pre-Test	32.27 ± 3.936	1.016	0.817
Post Test	31.93 ± 3.081	0.796	
Intervention Group			
Pre-Test	33.27 ± 3.788	0.978	0.000
Post Test	56,486 ± 5,486	1.416	

Table 3 shows that there is a significant difference between sleep quality before and after the intervention using a combination earplug and eye mask with a p value of 0.000 (p 0.000, 0.05). Meanwhile, in the control group, the results of the analysis showed that there was no significant difference between sleep quality before and after the control group intervention with a p value of 0.817.

Table 4. Analysis of Differences in Sleep Quality Differences in Respondents in the Intervention Group and Control Group (n=30)

Variable	mean	Mean difference	95% CI	*P value*
Control Group	0.34			
Intervention Group	23.21	-22.87	26.71 – 19.41	0.000

Table 4 shows the p value of 0.000. This shows that there is a significant difference between the difference in sleep quality before and after the intervention between the control group and the intervention group (p<0.000).

DISCUSSION

The hypothesis that the combination of the use of earplugs and eye masks has an effect on improving the quality of sleep of patients in the ICU between before and after treatment is acceptable. The results of the paired sample t-test obtained p value = 0.000 which means there is a significant difference before and after the implementation of the combination earplug and eye mask. The findings of this study are in accordance with the results of research by Yazdannik et al. (2014) that by providing a combination of these tools, there is a significant difference in the sleep quality of patients undergoing treatment in the ICU with p = 0.001.

The theory states that there are several factors that affect the quality of sleep of patients in the intensive room, including patient factors, nursing intervention factors on the night shift, medication factors and environmental factors. One of them is through environmental factors. Respondents who participated in this intervention stated that environmental factors, especially lighting and noise, were a factor in disrupting the quality of sleep for patients during treatment in the ICU.

In a previous study of 24 patients stated that they had trouble sleeping out of a total of 50 patients. The causes of this sleep disorder were noise (45%), feelings of fear (25%) and pain (19%). This study states that 10-17% of the noise in the intensive care unit is at a level that causes patients to wake up and wake up from their sleep, namely the noise reaches 70dB and is mostly caused by communication between staff and patients or with others as well as television. Noise experienced by patients can come from bedside monitor alarms, infusion/syringe pump alarms, pulse oximetry, officer telephone voices, television, room telephones and ventilator alarms. The noise level recommended by WHO is a maximum of 30dB and a maximum of 40dB at night. Objects that fall to the floor also have a sound magnitude of up to 92dB, nebulizer machine reaches 80dB. Noise can have an impact on physiological and psychological stress. Continuous sound exposure received by the patient will increase the sympathetic nervous system which then increases the work of the heart and affects the function of the respiratory muscles (Lawson et al.,

2010).

There is also a lighting factor. Light is an important external factor in influencing sleep. Light affects the internal clock through light sensitive cells in the retina of the eye. These cells inform the brain about day and night until our sleep patterns are formed. Bright light rays can cause sleep disturbances and inhibit melatonin secretion (Hu et al., 2015).

Poor quality and disturbed sleep can hinder recovery, interfere with the immune and neurological systems, inhibit wound healing and affect psychological conditions. Duong-Coburn (2013) research states that sleep has an essential role for a person's quality of life. Where during sleep, especially the NREM stage, the body and brain restore energy, and remove waste products from cell metabolism, especially from the brain. The peak of growth hormone secretion is during early sleep which functions to help the body repair physical damage, the hormone cortisol increases during sleep, and REM sleep is very important in restructuring memory. Increases catecholamine levels, increases the risk of delirium and the hormone prolactin.

The use of a combination earplug and eye mask was not fully approved by the patient, the habit factor and the level of comfort of the device also influenced the patient to refuse this intervention. There were several patients as many as three who responded reporting pain after using these earplugs and eye masks, but all patients in the intervention group received the same treatment and at the same time. To minimize the patient's refusal to intervene, the nurse first provides information regarding the benefits and functions of the device, then the nurse explores information related to sleeping habits and what makes the patient comfortable to sleep, besides that the nurse also learns the size of the earplug and eye mask to be used, how to install the device. and provide direction during the course of the intervention.

Daneshmandi et al. (2012) found that the use of eye mask can be used as an easy and economical alternative method to increase sleep satisfaction. The NSF publication (2012) wrote that light can inhibit the release of melatonin which is the main biochemical agent that affects sleep, and the use of eye masks can help shorten sleep onset so that individuals can sleep longer. In addition, the use of earplugs can also be used as an alternative nursing action to improve sleep quality. High enough sound levels can disrupt normal NRM and REM cycles, which can affect wake times and deep sleep. The effect of this eye mask and earplug can increase REM time, shorten REM latency period,

The sleep needs of critically ill patients require a level of comfort which is part of a nursing intervention that must be considered. Comfort from pain, from the environment and from the patient's condition. The limitations of this study are that there are still many patients who do not use earplugs and eye masks throughout the night, and the effect of medications given patients has not been studied further by researchers.

The obstacle found by the researchers when applying interventions was that each respondent had a different sleep habit when starting sleep, hours when starting sleep and waking up. This showed that the factors of sleep habits and culture could affect the patient's sleep patterns. In addition, there were also some respondents who occasionally opened eye mask and earplug, and re-used it again. After times, they got sleeping.

CONCLUSION

The provision of a combination earplug and eye mask intervention to improve the quality of sleep of patients in the intensive room of Bhakti Wira Tamtama Hospital Semarang proved to be very significant, with a p value of 0.000. Recommendations for further research are that more in-depth interventions can be carried out by paying attention to other factors, namely the patient's condition, giving nursing interventions at night to the use of medications that affect the patient's sleep quality while in the intensive room.

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