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Systematic Review

Use of Earplugs and Eye Masks in Patients with Sleep Disorders in the ICU: Systematic Review

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Abstract

The stimuli that can come from the care environment and the development of the disease influence the quality of sleep of patients in intensive care because they can reduce the secretion of melatonin. In contrast, the noise and excessive lighting of the ward will influence a circadian rhythm, impacting parturient disorders (sleep disorders). Therefore, nursing interventions to improve normal circadian rhythms are needed to improve the patient's sleep quality. Wearing earplugs and eye masks is an important and logical way to prevent awakening from sleep caused by external stimuli. This research aimed to determine the effect of ear plugs and eye masks on sleep quality in patients in the intensive care room. The method used is the literature review. This article was taken from Google Scholar for the period 2014–2022. The search and selection procedure based on PRISMA led to the analysis of 20 articles. Results: Based on the analytical results of 20 articles, show that there is an effect of applying ear plugs and eye masks to patients with sleep disorders in the intensive care room. The author recommends the implementation of ear plugs and eye masks in ICU sleep disorder patients because earplugs reduce noise and eye masks function as eye masks so that the light does not directly hit the eyes to improve the quality of sleep in patients in Intensive Care Unit rooms.

Keywords: Earplugs, Eye Mask, Sleep Disorders.

Introduction

Sleep, as one of the basic human needs, is beneficial in forming damaged body cells or a natural sleep *healing mechanism*. During sleep, the body's organs will rest and maintain the balance of the body's metabolism and biochemistry. *Reticular Activating System* (RAS) regulates sleep, consisting of the brainstem reticular system, posterior hypothalamus, and basal forebrain. The hypothalamus is the main sleep-secreting center *of hypocretin* which causes a person to sleep and wake up (Aziz & Warsono, 2022).

Sleep is an important part of the life cycle, and any disturbance during sleep affects health; therefore, everyone needs a good night's sleep (Aziz & Warsono, 2022). Sleep quality is the state of a person's sleep after waking up, feeling healthier, and causing freshness (Jayanthi & Hudiyawati, 2019). The quality of sleep of patients admitted to the ICU is critical to their survival and recovery from a life-threatening illness. Patients with critical conditions treated in the ICU experience changes in sleep patterns that can affect sleep quality (Jayanthi & Hudiyawati, 2019).

The ICU environment is usually foreign and physically and emotionally uncomfortable for patients and their families. Critical patients inherently experience changes in physiological functions that can weaken organs in the patient's body. In an assessment by Romadon (2018), 50% of those surveyed experienced sleep disturbances in intensive care (Herliani & Kristinawati, 2020)

Sleep disorders that are not treated immediately have a serious impact and become chronic. Lack of sleep and poor sleep quality can lead to hypertension and a high risk of stroke. Sleep disorders also

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cause psychological effects such as depression, anxiety, and difficulty concentrating (Aziz & Warsono, 2022).

Noise is a sleep disorder that is most often complained about by patients. Environmental noise in the intensive care unit has several causes. Medical devices in the intensive care unit cause noise, for example, telephone ringing, talking, beeping, and noise caused by suction and mechanical ventilation. Alarms from heart monitors, pulse oximeters, and ventilators increase the noise. This causes physiological changes that mimic the normal stress response, including vasoconstriction, increased diastolic blood pressure, dilated pupils, and muscle tension. When the sympathetic nervous system releases adrenaline, this effect prevents the patient from relaxing and falling asleep (Saini *et al*, 2015).

Sleep level *Non-Rapid Eye Movement* (NREM) is the most influential in stage I, while other sleep stages are disrupted. Stages III and IV are usually seen in 30 to 35 percent of cases with severe impairment, which ranges from 4.7% to 10.5%. The lighting system had to be adapted to solve the problem. Lighting has also been studied as a factor that can interfere with sleep. The biological clock is regulated by normal light-dark cycles, which are important for maintaining sleep-wake cycles. Since the release of melatonin signals the body's internal clock that it is time to sleep or wake up, changes in the light-dark cycle significantly impact sleep cycles. The patient's sleep is disturbed at night because the lights in the nurse's room are bright and cannot be turned off (Saini *et al*, 2015).

Nurses are important in providing interventions to minimize patient sleep disturbances. One of the methods to overcome sleep disturbances is environmental modification (Aziz & Warsono, 2022). Environmental modification aims to reduce sound intensity, reduce lighting, and adjust maintenance procedures at night when using *earplugs* and *eye masks (*Vevi & Beti, 2020).Nursing interventions such as *earplugs* and *eye mask*s can help patients with sleep disorders sleep better and help restore normal circadian rhythms. Because *earplugs* and *eye mask*s can affect patients' physical and mental health, this application is needed to improve sleep quality (Aziz & Warsono, 2022).

Utilise *earplugs* to reduce noise and *eye mask*s to reduce lighting systems can help patients feel more comfortable and calm in the right setting (Vevi & Beti, 2020). *Earplugs* and *eye mask*s are a simple and inexpensive way to help people in intensive care units get a better night's sleep and improve their sleep quality (Aziz & Warsono, 2022).

Research Methodology

The method used is a literature review. Article selection was based on the PRISMA system (*Preferred Reporting Items for Systematic Review & Metaanalyses*) when doing a literature review and the PICOS format. The data used is secondary data. Data collection uses an electronic database, *Google Scholar.* The data sources were obtained from journals that reviewed the use of *earplugs* and *eye mask*s in the ICU for sleep disorder patients. Keywords are adapted to *Medical Subject Heading (MeSH)* and arranged in the table below.

Table 1. Keyword *Literature Review*

Earplug	Eye Mask	Sleep Disorders	Intensive Care Room
Earplugs	*Eye Mask*	*difficulty sleeping*	*ICU*
OR	*OR*	*OR*	*OR*
Patients with earplugs	*Patients with the eye mask*	*Sleep Quality*	*Intensive Care Unit*

Table 2. Inclusion and Exclusion Criteria Used *Literature Review*

Criteria	**Inclusion**	**Exclusion**
Population	The study of the effect of applying measures *of earplugs* and *eye mask*s in patients with sleep disturbances in the room *Intensive Care Unit*	There aren't any
Intervention	Application of actions *earplugs* and *eye mask*	There aren't any
Comparison	*No Comparator*	*No Comparator*
Results	The effect of applying the action *earplugs* and *eye mask*	No. Effects of applying the action *earplugs* and *eyemask*
Study Design and Type of Publication	Askep approach, controlled trials, quasi-experiments, and clinical trials *across-sectional*	There aren't any
Year published	After 2014	Before 2014
Language used	Indonesian, English, and Arabic	Apart from Indonesian, English, and Arabic

Between 2014 and 2023, the number of articles found in search *Google Scholar* filtered (11,700). From the inclusion and exclusion criteria that have been determined, the researcher determines the data sources to be studied. According to chart 1, the method of collecting literature.

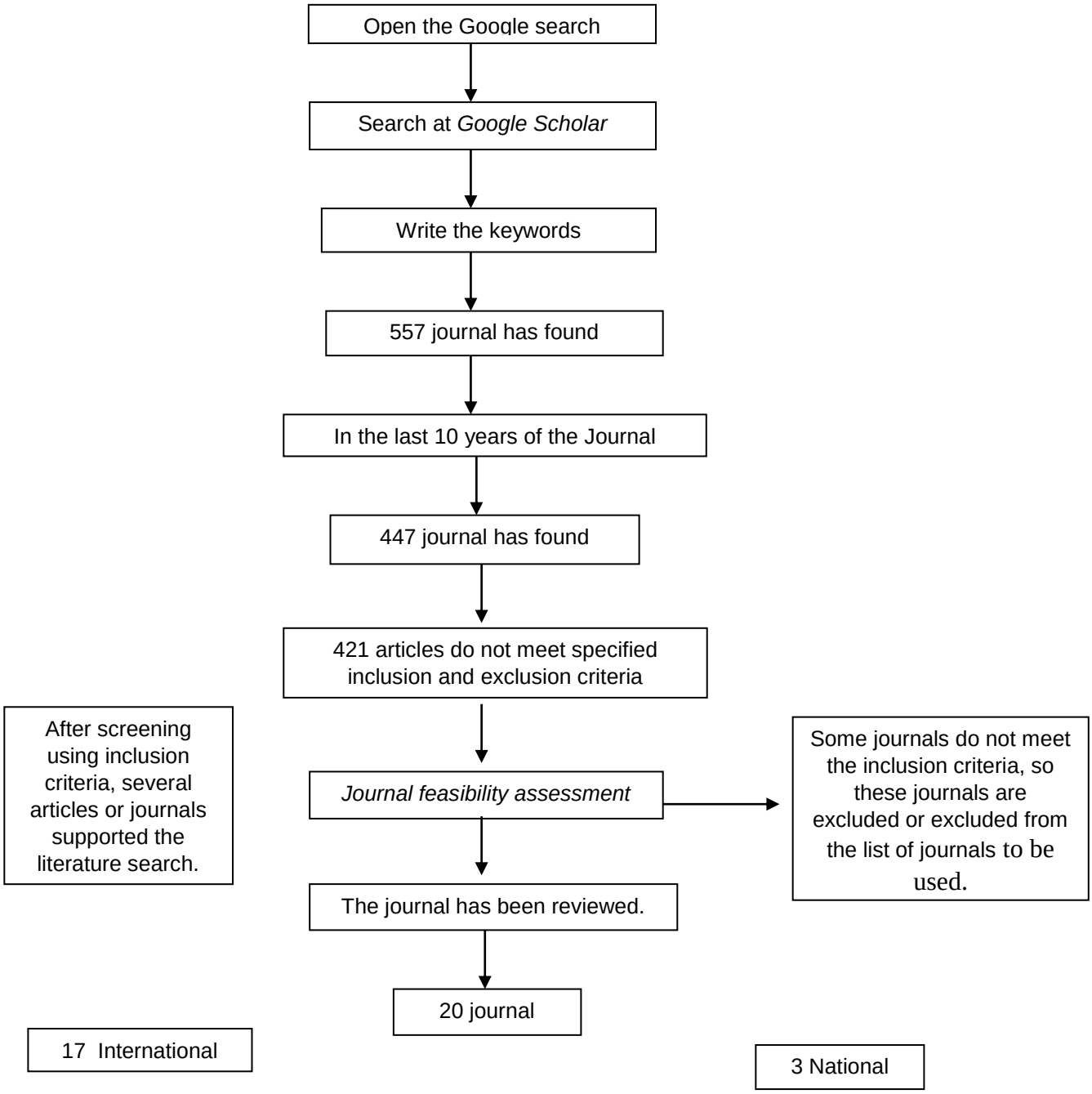

Chart 1. Procedure for Collection *Literature Review*

Results And Discussion

In place of the review's research findings, *literature* was conducted in various countries. In several studies, the respondents were patients with sleep disturbances in the intensive care unit. Of the 20 articles, us*ing earplugs* and *eye mask*s in the ICU can help with sleep disturbances. In the original article, the search found 557 articles; after *filtering* 2014–2023, there are 447 articles. Then do an eligibility assessment. Thus, the number of articles in *review* is 20 articles.

Table 3. Effect of Implementing Actions *Earplugs* and *Eye mask* in Patients with Sleep Disorders in the ICU

No	Authors	Title	Design & Sampling	Intervention	Results
1.	Akpinar *et al*, 2022	Effect of earplugs/eye mask on sleep and delirium in intensive care patients.	*This randomized, controlled experimental study was conducted on patients admitted to a coronary intensive care unit.*	The patients in the experimental group used *earplugs* and *eye mask*s at night, while those in the control group received only routine care.	Data was collected using an information form, Richards-Campbell *Sleep Questionnaire* (RCSQ), and the intensive care delirium screening checklist (ICDSC). **A significant difference in statistical results prove**s between the mean Time-1 and Time-2 scores of the experimental and control groups on the RCSQ and between the mean Time-2 scores **of the experimental and control groups on ICDSC (U = 198.00, P < .001; U = 70 000, P < .001; U = 614 000, P = 004.**
2.	Aziz & Warsono, 2022	The Effect Of Earplugs And Eye Masks On Sleep Quality In Patients In The Intensive Care Unit.	Case study with nursing care process approach. The sample of patients in the ICU who experienced disturbed sleep patterns was two respondents.	The second nursing intervention for case study patients was sleep support. Planned sleep support includes observation (identification of activity patterns and sleep rhythms, identification of physical and mental sleep-disturbing factors), therapeutic (environmental modification using electronic *earplugs* and *eye mask*s, creating a regular sleep schedule, and taking steps to increase comfort. The treatment of the two case study patients had the additional requirement for improvement in sleep quality with the use of e*arplugs* and *eye mask*s for 7 hours in the span of 2 consecutive nights.	***We were using earplugs and eye masks* proven to be able to improve the quality of sleep in patients in the ICU.**The diagnosis of sleep pattern disturbance in 2 cases was reduced after two nights of intervention. Sleep quality was measured using *the coreRichards-Campbell Sleep Questionnaire* (RCSQ). Case I, from a score of 33, namely poor sleep quality, became a score of 77, namely the best quality of sleep, while case II, from a score of 35, namely poor sleep quality, the score became 75.
3.	Babaii *et al*, 2015	*Effect of an eye mask on sleep quality in cardiac patients: a randomized controlled trial.*	In this randomized controlled trial, 60 patients who met the inclusion criteria were selected using the same sampling method and allocated	In the control group, patients received routine sleep care provided at the study site. Routine sleep maintenance includes reducing environmental noise and indoor lighting levels and providing care during the day to avoid disturbing the patient's sleep at night. Patients in the experimental	The Wilcoxon signed ranking test showed that the mean subjective sleep quality, sleep latency, duration, habitual sleep efficiency, range of sleep disturbances and daytime dysfunction, and mean PSQI number decreased significantly **in the experimental group. After the intervention, the p-value <0.05**

			randomly to the experimental and control groups.	group received routine sleep care and an eye mask for eight hours, from 10:00 pm to 6:00 am every night. During this period, the eye mask was put on the patient's eyes, and the first researcher checked the correct use. On the morning of the fourth day of the study (i.e., after the third eye mask session), patients were asked in both groups to complete the PSQI again.	
4.	Vevi & Beti, 2020	*Shi among ICU patients: A randomized control trial Research Article Lugs & Eye Mask On Sleep Among ICU Patients: A Rando Control Trial*	The study was conducted on 100 patients. Sampling using *convenience sampling* with 50 patients for the experimental group and 50 for the control group in the ICU.	Samples were randomly divided into two groups: with e*arplugs* and *eye mask*s (experimental group) for two consecutive nights and without earplugs and eye plugs (control group). Then a comparison was made to assess the effectiveness of earplugs and eye masks in improving sleep patterns by doing *pretest*s on the 1st-day and *post-test*s on day 3 in both groups.	SPSS statistical software was used for calculations (19). The difference in study averages increased significantly in the experimental group compared to the control group, showing that wearing earplugs and eye patches helps people sleep better***(p=0,000).***
5.	Arttawejkul *et al,* 2020	*Effect of Earplugs and Eye Masks on Improving Patients' Sleep Quality in Intensive Care Unit.*	A quasi-experimental design was used to fulfill the research objective. A purposive sample of 35 adult patients met the inclusion and exclusion criteria.	Simple interventions such as ear plugs and eye patches at night the use of ear plugs and eye patches were completed over two days (8 hours at night). Beginning with filling in the kits the researcher for the patient, with the help of the researcher for any explanations after that, a general identification of the importance of ear plugs and eye covers at night for ICU patients. Earplugs and eye masks are worn nightly from 10 pm to 6 pm and are tested at night, and the patient must be psychologically stable, consider the barrier use of earmuffs and eye patch and replace them with something	The results showed statistically significant differences in the study group regarding sleep disturbance, post-implementation sleep quality*earplugs, and eye mask*s in ICU. This study shows significant differences in overall sleep quality in the prior study group ***using earplugs dan eye mask*s in ICU (Z=7.91, P=0.001).**

				else if damaged or dropped.	
6.	Bani Younis *et al*, 2019	*Effectiveness of eye mask and earplugs on sleep length and quality among intensive care patients: A quasi-experimental study.*	With a quasi-experimental design *pretest* and *posttest*. Sample 102 patients. Patients were divided into experimental group and control group participants.	The research intervention included using an eye mask and earplugs for one night for each patient in the sleep control group from 10 pm to 12 pm. The experimental group was asked to sleep anytime between 10 pm and 12 pm.	The research results show a **significant difference** in overall sleep quality before and after us*ing earplugs and eye mask*s. **P-value = P<0.001, two-tailed.**
7.	Chaudhary *et al*, 2020	*Sleep promotion among critically ill patients: earplugs/eye mask versus ocean sound-a randomized controlled trial study. Crit Care Res Pract.*	*A true experimental cross-over design was used in which the participants acted as their control.*	The researcher instructed participants to wear *earplugs* and *eye mask*s. Researchers instruct to wear *earplugs* and *eye mask*s. To the patients from 10 : 00 pm to 7 : 00 am.	Repeated ANOVA measurements show a significant change **in the sleep quality score (p=0.001),** which showed that the sleep quality score increased after administ*ering earplugs* and *an eye mask*. The conclusion *is that earplugs* and *eye mask*s can improve sleep quality.
8.	Dave *et al*, 2015	*Effects of Earplugs and eye masks on Perceived Quality of Sleep during the Night among Patients in in- tensive care units*	Cross-over design with 50 samples	Group A received the intervention (earmuffs and blindfolds) at night, starting at 9 pm and ending at 6 am on the first day, and received no intervention on the second day. Group B received no intervention at night on the first day and received the intervention (ear plugs and eye patches) on the second day, starting at 9 pm and ending at 6 am.	ICU patients' mean sleep score was 43.06±731 on the first night without intervention and 68.74:6.54 on the second night with intervention (using earplugs and eye patches). **The difference was statistically significant between groups p-<0.05** Simple interventions such as ear plugs and eye patches can contribute to patients trying to sleep in the ICU. This **can be used as a sleep intervention** acceptable to the patient and an alternative to sleeping pills.
9.	Demoule *et al*, 2016	*Impact of earplugs and eye mask on sleep in critically ill patients: a prospective randomized study.*	A one-center randomized controlled trial of 64 ICU patients was conducted from July 2012 to December 2013.	Patients were divided into two groups: The control group received routine medication at night, and the intervention group received routine medication and *an eye mask*. This procedure is carried out every night at 10:00 pm 00.08 from admission to discharge from the intensive care room.	In the intervention group, (30%) of patients did not wear earplugs all night. **The proportion of sleeping N3 was 21 [7-28]% in the intervention group and 11 [3-23]% in the control group (p = 0.09).** So the conclusion *is that earplugs* and *eye mask*s reduce long awakening times and increase the duration of N3 if well tolerated.

10.	Hu *et al*, 2015	*Effects of earplugs and eye masks combined with relaxing music on sleep, melatonin and cortisol levels in ICU patients: a randomized controlled trial.*	This study was a prospective single-center randomized controlled parallel group clinical trial randomized into two groups Accordingly, data analysis was performed for 20 cases in the group intervention and 25 cases in the control group	The control group received routine care at night after surgery, and the experimental group received protective gear (wearing *earplugs* and *eye mask*s at bedtime). The patient wear*s earplugs* and *eye mask*s from 21:00 every night until the next morning. After randomization*, earplugs* (3 M Corporation, Beijing, China) dan *eye mask*s were administered 2 to 3 days before surgery, and patients in the intervention group were asked to take them.	**Results** indicate the combination of *earplugs* and *eye mask* data from 45 patients (20 in the intervention group, 25 in the control group) were analyzed. Significant differences were found between **groups in deep sleep, fell asleep, woke up, fell asleep again after waking up, andoverall sleep quality (P < 0.05).**
11.	Khalil *et a*l, 2019	*Effects of non-therapeutic measures on sleep quality among critically ill patients, Egypt.*	A research design *quasi-experimental* was used to apply this research.	The researchers conducted a usage intervention *for earplugs* and *eye mask*s among the study groups for three consecutive nights as follows; *earplugs* and *eye mask*s were worn simultaneously every night from 10 pm to 7 am. In wearing *earplugs*, the nurse rolls the earmuffs into a small "snake" using the fingers of one hand. Then, the nurse pulls the top of the patient's ear up and back with the opposite hand to straighten the ear canal, and the rolled earplugs are inserted. Furthermore, *earplugs* are held with fingers and counted to 20 or 30 loudly. Waiting *for earplugs* expand again fill*er plugs* patient during that time. The sound is not heard when the plug is closed properly.	**Significant improvement** was the highest in total sleep quality on the third night. Thus, almost all patients in the study group showed **better sleep quality (97%) than (6.1%) in the control group.** This finding may be relevant because using *earplugs* and *eye mask*s can improve patients' sleep quality in critical care settings to reduce environmental noise that arises from various causes, as well as talking, telephone, and equipment sounds that come from suctioning.
12.	Koçak & Arslan, 2021	*The effect of using eye masks and earplugs on intensive care*	Design *pretest-posttestis non-randomized* with the control group. This	They have performed in an 8-bed neurology ICU between October 31, 2017, and May 28, 2018. Nurses observed patients overnight and those who removed *earplugs* and *eye*	RCSQ average score (SD) *pretest* and *post-test*, respectively, were 50.21 (16.02) and 68.50 (17.57) for the experimental group and 55.34 (16.62) and 49.03 (15.53) for the control group. **The RCSQ score *post-test* was significantly**

		patients' sleep quality and vital signs.	was done with 64 patients, i.e., 32 in the experimental and 32 in the control groups.	*mask*s for over 15 minutes. On the second and third mornings of the study, the researcher gave *Richards-Campbell Sleep Questionnaire (RCSQ)* to all patients.	**higher in the experimental group than the RCSQ score-*pre test* (P < 0,01).** This study shows that *earplugs* and *eye mask*s can improve ICU patients' sleep quality.
13.	Mutarobi *et al*, 2019	Application *Evidence-based Nursing* Influence *Earplugs* and *Eye Mask* On Sleep Quality in Patients in the ICU.	The design for implementing this EBN *randomized controlled trial (RCT)cross-over design*. The number of samples is 24 respondents. The researcher divided the two groups, Group A and Group B, with *simple random sampling.*	On the first night, group A was given intervention with *earplugs* and *eye mask*s between 21.00 and 06.00 WIB. Then no treatment was given on the second night (routine setting). While Group B received no treatment on the first night (routine setting), on the second night, the procedure was carried out with *earplugs* and *eye mask*s from 21:00 to 06:00 WIB.	Statistical test results show a that**-value less than 0.05**, indicating that *using earplugs* and *eye mask*s may affect the improvement of sleep quality, as the findings of the study show.
14.	Obanor *et al*, 2021	*The impact of earplugs and eye masks on sleep quality in surgical ICU patients at risk for frequent awakenings*	A prospective randomized controlled trial. There were 43 patients in the control group and 44 in the intervention group as a sample.	The patients were randomly assigned to the intervention group or the control group. The intervention group got *earplugs* and *eye mask*s in addition to standard postoperative care, while the control group received standard postoperative care.	***According to these findings, earplugs* and *eye mask*s can improve sleep quality** in ICU patients who undergo frequent examinations. In the intensive care unit, the results are convincing about the added power of nonpharmacologically enhancing sleep quality.
15.	Rahmanti &Mulianda, 2022	*The Use of Earplugs and Eye Masks to Improve Sleep Quality of Patients in the ICU.*	*A quasi-Experimental design is an experimental research method with the Pretest and Post test Control Group approach* using a control group. The respondents study was divided randomly into two	Interventions are given every night from 22.00 to 05.00 (7 hours) from when the patient enters until the patient leaves the ICU. A trained nurse performs the insertion of the device. A combination of gifts, *earplugs*, and *eye mask*s for patients in the ICU is given while the patient is being treated in the ICU; the intervention is carried out at night from 21.00 WIB to 05.00 WIB. Before and after the intervention, patients were assessed for their	With ***a p-value of 0,000,*** using intervention *earplugs* and *eye mask*s to improve patients' sleep quality in the ICU of Bhak Wira Tamtama Hospital is very significant.

			groups in this design.	sleep quality and comfort	
			This study's respondents were 15 intervention groups and 15 control groups.	using VAS (0-100mm). During data collection, all patients in the intervention group received the same treatment, i.e*., earplugs* and *eye mask*s at a time. That is, as many as 15 people intervened, and as many as 15 people also became the control group without being given intervention.	
16.	Risch, M.S.N. (2020)	*The effects of non-pharmacological interventions consisting of earplugs and eye masks, reducing environmental factors to improve self-reported sleep quality in ICU Patients*.	Experimental design, the sample size of 42 participants; 21 in the intervention group and 21 subjects in the control group	Intervention group patients were asked to attach *earplugs* and *eye mask*s from 11:30 pm to 5:30 am. The patients can take off *earplugs* and *eye mask*s for 10 minutes or less at night and for as long as the procedure takes.	The results show that the non-pharmacological intervention has a clinically significant, moderate effect in improving the Sleep of ICU patients in the first 24-48 hours. Next, we separated the sample for patients who took *earplugs* and *eye mask*s over the entire sleep period to assess differences in sleep scores (n = 33).
				After the sleep period, patients in both groups were asked to sleep and complete an 8-item visual analog questionnaire about the previous night's sleep. Each participant was asked to circle a point on a scale of 0 to 100. Both groups were interviewed to determine which factors hindered and helped them sleep. Patients in the intervention group were asked to compete on a Likert comfort rating scale to rate the comfort level of the eye mask and earmuffs.	There were significant sleep scores between the intervention and control groups. The number of awakenings during the sleep period mean score in the intervention group was 20.0 (SD-27.62), while that of the control group was 53.81 (SD 29.75). This was significant (t-3.2, p=.0003), indicating that the intervention group was less awake during sleep. The total time from going to bed until waking up the average morning score for the control group was 37.14 (SD=17.04), while for the intervention group was 62.5 (SD-21.79). **The result is significant** (t=23,43, **p=0.0003)**
17.	Robby *et al*, 2016	The Effect Of Eye Masks And Earplugs On The Quality And Quantity Of Sleep In Preoperative Patients In The	This research is a quasi-experimental comparative analytic research approach *pretest-posttest.* Statistical analysis with a paired t-test consisted of	The recording results of the device are displayed by the Mi Fit software that can work on *smartphone*s with Android and iOS operating systems. Data collection was carried out for 8 hours from 21.00 to 05.00 WIB.	Sleep quality achieved by **the group** had the highest average DS compared to the average of the other groups and experienced a significant decrease after the intervention**(p=0,000<0,05).** This intervention also significant**ly affected sleep quality in the EP group (p = 0.001 <0.05).** The combined EM + EP group experienced significant improvements in sleep quality **significantly after the intervention, like the other**

		Surgery Inpatient Room Dr.Soekardjo, Tasikmalaya City	preoperative patients from the surgical patient room of RSUD Dr.Soekardjo City in Tasikmalaya.		**groups (p = 0.038 < 0.05).** It was established from previous analyses that the combined EM, EP, and EM+EP interventions effective**ly improved sleep quality**.
18.	Sharafi *et al*, 2018	*The effect of simultaneously using earplugs and eye masks on sleep quality in intensive care unit patients: a randomized clinical trial study.*	This study was conducted on 73 patients admitted to the ICU of Ghaem Hospital and Imam Reza Hospital in 2016 in Mashhad. Intervention (36 people) divided into the intervention group, control group (37 people)	The intervention was carried out 3 days at 10 pm every night, opened at 06.00 am, allowed a maximum of 10 minutes to interact with nurses, the Glasgow scale questionnaire to measure the level of alertness, and the Vran-Schneider-Halpern sleep questionnaire to measure sleep quality.	Between the two groups before and after the intervention, there was a statistically significant difference in sleep quality scores (z=-4.27,**p< 0,001).**
19.	Tabas *et al*, 2019	*Effect of eye masks, earplugs, and quiet time protocol on sleep quality of patients admitted to the cardiac care unit: A clinical trial study.*	*Comparative studies with 135 patient*	Usage *earplugs* and *eye mask*	There was a significant difference between the groups regarding sleep disturbance after the intervention (p=0.001). There was no difference between the mean sleep efficiency scores of the three groups before the intervention (mean/SD 127.95±33.93, p = 0.99), but these groups differed significantly. **Significant in sleep efficiency after the intervention (Mean/SD 132.28±04.98, p = 0.02)**
20.	Arttawejkul *et al*, 2020	*The effect of earplugs and eye masks on patients' perceived sleep quality in the intensive care unit.*	In clinical trials *cross-over*In this study, 50 patients in the ICU of Al-Zahra Medical Center in Isfahan in 2012 were selected by *convenience sampling* and randomly divided into two groups. In group A, patients wore *earplugs* and	In group A, after educating the patient about the correct way to use *earplugs* and *eye mask* on the first night of treatment (intervention), each patient receives a pair *of earplugs* and *eye mask* and is asked to sleep at 22:00 or earlier (if they like) while wearing *earplugs* and *eye mask*. On the second night (control night), patients in this group were asked to go to bed at 10 pm or earlier (if they wanted) without wearing	The Verran and Snyder-Halpern Sleep Scales were used to measure the patient's sleep quality. Data were analyzed by paired t-test, independent t-test, one-sample t-test, and one-way analysis of variance (ANOVA) via SPSS version 18. The effect of the intervention on sleep effectiveness is positive, and there are significant differences *(P* < 0.001) between the treatment night and the control night, and also in **each group*(P* < 0,001**). Also, the mean scores for sleep supplementation were measured after the second night, and **the result** showed a significantly

*eye mask*s on the first night while sleeping and sleeping without *earplugs* and *eye mask*s on the second night, and the intervention was carried out in reverse in group B.	*earplugs or an eye mask*. In group B, on the first night of the study (control night), patients were asked to go to bed at 10 pm or earlier (if they wanted) with *earplugs* and *eye mask*s. On the second night (night of treatment), after education on how to use *earplugs* and *eye mask* that's right, each patient gets *earplugs* and *eye mask* and is asked to sleep at 22:00 or earlier (when they like) by wearing *earplugs* and *eye mask.*	increased score in **intervention groups compared with the control group*(P* <0.001, ER = 47, F = 22.1).** Moreover, the carryover effect for sleep efficiency and sleep disturbance is positive, but the periodic effect for sleep efficiency and sleep disturbance is negative and positive, respectively.

Discussion

Getting enough sleep is one of the most important things a person needs to feel healthy and look their best. During sleep, certain hormones such as serotonin and growth hormone are released, followed by chemical changes and increased cellular repair, thus preparing the body for the next day's activities, which include improving memory and learning function, reducing stress, anxiety, and nervous tension, and assisting individuals in recovering energy to improve focus, adaptability, and enjoy daily activities (Mutarobin *et al*, 2019).

The reticular activating system, or SAR for short, impacts how sleep and wake mechanisms are controlled. *The Reticular Activating System* (SAR), located at the top of the brainstem, comprises specialized cells that keep you awake and asleep. When the SAR activation is higher, the person is conscious, while when the SAR activation is lower, the person is sleeping. Neurotransmitter activity has an impact on SAR activity. Mechanisms in the brain simultaneously activate and deactivate sleep and wake centers. The reticular activating system controls all central nervous system functions, including wakefulness and sleep regulation, and controls sleep activation (Aziz & Warsono, 2022).

Someone who has a sleep disorder doesn't get enough sleep. Someone will become irritable, more reactive, and unable to handle people or situations effectively in this condition. The human circadian rhythm controls the complex and active process of sleep. The day-night cycle, which normally instructs people to sleep at night and wake up during the day, serves as the basis of this 24-hour biological clock (Mutarobin *et al*, 2019).

A hospital intensive care unit, or ICU, is a place where very intensive care and treatment are provided. Patients are admitted to the intensive care unit when their condition is life-threatening. To maintain normal body levels, the intensive care unit ensures continuous and immediate monitoring and technical and medical support (Mutarobin *et al*, 2019).

Therefore, sleep disturbances need serious attention. Several studies have shown that poor sleep quality and the inability to sleep are the second biggest causes of stress and rank among the top three sources of anxiety during ICU stays. Patients admitted to the ICU often experience sleep disturbances, loss of circadian rhythms, and reduced time spent in restorative sleep (recovering lost energy by repairing and growing cells) (Arttawejkul *et al*, 2020).

Environmental factors are one of the factors that affect the patient's sleep. These environmental factors consist of noise and excess light. So intervention is needed to reduce noise and lighting systems (Aziz & Warsono, 2022).

The WHO Guidelines for the Assessment of External Noise in Communities recommend determining specific noise levels in a hospital setting. Recommendation: Night-time noise levels should not exceed 35 dB, and daytime noise levels should not exceed 40 dB. Noise levels in the intensive care unit (ICU) are much higher than at home (Mutarobin *et al*, 2019).

Various factors, including patient care and medical equipment, contribute to excessive noise exposure in intensive care units—mechanical alarms account for most of the noise in the ICU. In the intensive care unit (ICU), nurses and other healthcare workers share about 80% of the responsibility for managing noise (Mutarobin *et al*, 2019).

Lighting has been identified as a factor in sleep disturbances. The biological clock is regulated by normal light or dark cycles, which is crucial for maintaining sleep patterns until a person wakes up. Because melatonin retention tells the body's internal clock when it's time to sleep or wake up, changes in the light-dark cycle significantly impact sleep rhythms. The nurse's lamp is bright, cannot be turned off, and makes it difficult for the patient to sleep at night or in an emergency (Mutarobin *et al*, 2019).

The most significant influence on a person's sleep-wake cycle is the lighting conditions of the light-dark cycle, which ultimately contributes to developing a peaceful environment. A person's wake-sleep cycle may deviate from their normal 24-hour cycle if environmental factors are not adjusted appropriately. Even if ICU lights are dim, ICU night light levels range from 5 to 1400 lux, and between 100 and 500 lux can affect melatonin secretion and circadian rhythms (Mutarobin *et al*, 2019).

Healthcare providers' awareness of environmental factors, such as excessive noise and lighting, that can interfere with the patient's sleep quality, must be improved. Patient care activities and invasive procedures are given, and procedures, including mechanical ventilation, must be considered as factors that can interfere with patients' sleep quality in the intensive care unit (Mutarobin *et al*, 2019).

Disruption of sleep patterns will affect the production of immunity for dealing with diseases in the body (Aziz & Warsono, 2022). So that immunity needs to be increased by overcoming disturbances in sleep patterns as a priority to improve a person's sleep quality (Aziz & Warsono, 2022).

The literature review results revealed that the intervention of *earplugs* and *eye mask*s significantly improved the patient's sleep quality. Interpretation of improvement in patient sleep quality after use *of earplugs* and an *eye mask* In the patient's sleep, the circadian rhythm mechanism arises. *Earplugs* The one used is made of foam and has a size that fits the patient's ear. At the same time, the eye patch used is made of gel, which can provide a cold or warm sensation according to the patient's comfort level (Rahmanti & Mulianda, 2022).

Applying *earplugs* and *eye mask*s could be used as a simple and cost-effective alternative to improve patients' sleep quality. Usage *earplugs* and *eye masks* can help minimize the time it takes a person to fall asleep and allow them to sleep longer (Aziz & Warsono, 2022).

Impact *ear plugs* on a person's ability to get a good night's rest to help improve the quality of one's sleep because if the volume is loud enough, it can disrupt the typical cycles of non-REM and REM sleep, which in turn can affect the time of awakening and the quality of deep sleep. If the patient uses *earplugs* then disturbing sounds will be minimized because the use of earplugs reduces the patient's sound perception by 32 dB, which has the benefit of reducing patient sleep disturbances (Aziz & Warsono, 2022).

The *earplugs* should be in the ear canal on the foam body. If distant sounds are heard more by the ear than nearby sounds, it is probably because *earplugs* do not cover well and must be removed and reinstalled. Then, if the intervention has been done, the *earplugs* are gently released in a circular motion to slowly open the seal so as not to damage the eardrum, and *the earplugs* are disposable. If it can still be used, then *earplugs* keep it clean by removing the earwax and removing it before putting it back in (Khalil *et al*, 2019).

To reduce the lighting system, the *eye mask* can also affect a person's ability to get a good night's rest and help improve sleep quality (Aziz & Warsono, 2022). When the patient's brain receives light at night, it directly affects the light-dark cycle. The patient's brain perceives light as daylight and then signals the pineal gland to stop the secretion of the hormone melatonin. When the patient uses *an eye mask*, it creates darkness. As a result, the patient's brain accepts this darkness as night time and sends commands to the pineal gland to increase the production of the hormone melatonin, which allows the patient to maintain sleep (Bani Younis *et al*, 2019).

When wearing *an eye mask*, it must be considered *that the eye mask* must be securely attached with tape or elastic bands positioned appropriately to keep it in place. *eye mask* must be fixed around the head; *the eye mask* installed must not be too tight or too loose; and finally, once the *mask is* installed, it must be ensured that no light penetrates the patient's eyes (Khalil *et al*, 2019).

The use *of earplugs* and *eye mask*s positively impacts patients' sleep quality in the ICU, according to *a review* of 20 journals. The researchers concluded that using *earplugs* and *eye masks* Covering the eyes and ears is a practical and logical way to prevent awakening during sleep due to external stimuli that can disrupt sleep and maintain normal circadian rhythms.

Conclusions

Based on the findings of a *review* of 20 journals, it can be concluded that wear*ing earplugs* and *eye mask*s improves the quality of sleep experienced by ICU patients. As a result, this procedure can be used in standard care for ICU patients with sleep disorders. It has no side effects, is inexpensive, and is easy to use for sleep-supporting recovery interventions. *The authors* suggest earplugs and eye masks improve the sleep quality of patients in intensive care units, regulate metabolic processes in the body, and accelerate healing.

Conflicts of Interest

The authors declare that they have no competing interests in writing this article.

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