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Research Article

The Effect of Combined Foot Massage and Nature Music on the Sleep Quality of Critically Ill Patients

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Abstract

Aims: Critical patients in ICU and HCU often experience poor sleep due to excessive stress and various symptoms like environmental factors, pain, noise, anxiety, and physical discomfort. Foot massage and natural music interventions can help meet their sleep needs, providing a relaxing effect and improving physical and psychological conditions. The purpose of this study is to determine the effect of providing combination therapy of foot massage and natural music therapy in Dr. Hospital's peacock room Salamun 2023.

Methods: This type of research is pre-experimental with a pre-post test of one group and uses the Richard Campbell Sleep Questionnaire (RCSQ). Then the data was processed using a paired sample T-test. The sample in this study is 16 respondents.

Results: The results of the statistical test obtained a p-value of 0.01, meaning that there was an effect between the pretest and posttest of the combination of foot massage and natural music therapy on the quality of sleep in critical patients in the peacock room at Dr. Salamun Hospital, Bandung City, 2023.

Conclusions : the conclusion of this study is that there is an effect of foot massage therapy and natural music on the sleep quality of critical patients as shown by the results of measuring the quality of critical patients before and after consecutive interventions with massage of both feet combined with natural music. For 10 minutes it has been proven to be able to improve sleep quality in critically ill patients so that this intervention can be applied as a therapy to improve sleep quality.

Keywords:

Critical, ICU, HCU, Foot Massage, Natural Music, Sleep quality

INTRODUCTION

Critical care room is a special room service for patients who experience system failure at physiological criticality that is potentially reversible and endangers one or more body systems or even life (1). Critical patient conditions have a poor state of health with vital organ dysfunction, a high risk of immediate death if treatment is not given and potential reversibility. Then the more critical the patient, the more likely he or she

is to become very vulnerable, unstable, and complex (2).

Vital signs and other indicators that are constantly monitored as the patient receives treatment in the critical care unit. Because critical patients have high morbidity and mortality rates, it is important to identify critical patients immediately and initiate appropriate initial therapy in critical conditions to minimize

the risk of further deterioration and maximize the likelihood of recovery. (3). An Intensive Care Unit (ICU) is a special nursing room reserved for patients with acute or chronic illnesses in life-threatening or emergency situations. These patients require close monitoring of vital signs, and care in the ICU cannot be given in the same way as in a general care room (4).

In a family unit, an illness suffered by one family member will often affect other family members. If one of the individuals in a family suffers from an illness and requires nursing care, then this will cause psychological problems for both the patient and the family such as stress, fear of loss and anxiety (5). According to WHO, the prevalence of critical patients is 274,396 cases with a population of 238,452,952, including from the 10 most common diseases in Indonesia, in Indonesia there are a total of 30,154 cases (4.9%) in hospitals in Indonesia. Preliminary analysis of Aloe Saboe's medical records, 383 patients in severe condition were placed in the ICU room, with a loss of consciousness rate of 97.8% (6).

In Asian countries such as Indonesia, there are 16 hospitals, especially in the ICU room with ventilators installed as many as 1285 patients, and there are 575 patients who have died, chronic critical patients, serious injuries, head injuries, and tracheostomy. Critical patients admitted to ICUs with chronic diseases can lead to an increase in deaths worldwide, with 1.1 to 7.4 million people dying. Critical patients are patients who are physiologically unstable, so they experience a complex hypermetabolic response to trauma, pain experienced that can alter the body's metabolism, hormonal, immunological and homeostatic nutrition, and most patients with critical pain experience multi-organ failure that makes it difficult to sleep (7)

Sleep is a repetitive and frequent, reversible state characterized by a state of relaxation and increased responsiveness. Sleep is part of the circadian rhythm, if a

person has the habit of sleeping on time and regularly, the next day the body will react to sleep on time. Normal sleep patterns duration and normal sleep quality vary between people from all different age groups, age division and sleep needs include: neonates (sleep about 16 hours), infants (sleep 22 hours), toddlers (sleep 12 hours), children (sleep 11-12 hours), adolescents (sleep 7.5 hours), adults (sleep 8.5 hours), and Elderly (4-6 hours) (8). Factors that cause poor sleep quality of patients in critical nursing rooms are such as vital sign checks, lighting, pain, people while chatting, nebulizers, ventilator alarms, heart monitor alerts, medication administration, noise, ventilator alarms, and televisions (9).

Massage Foot is a non-pharmacological therapy that uses techniques by combining a number of nursing skills such as touch that provides a relaxing effect, and distraction (10). Therapy Foot Massage It is great to be an option as a complementary therapy for Improve the Sleep Record of Critical Patients, Because This therapy has Low risk, simple, no side effects, does not require large costs and is proven to be more effective than other therapies (11).

This foot massage technique can activate basic reflexology techniques, such as rubbing, spreading the thumb, turning the hand at one point, and pressing and holding. Massage and pressure on the feet are stimuli that can cause waves of relaxation to spread throughout the body (12). This technique can also be combined with non-pharmacological techniques, one of which is nature music. Nature music is the sound of music that gives rise to various sounds in nature that can produce a relaxing effect on the body, mind and affect the physiology of the body towards the activation of the sensory cortex, the subsequent activation in the neocortex flows to the limbic system, hypothalamus, the autonomic nervous system is a way for the sound of music to have therapeutic benefits on the mind and body (13).



Nature sound music therapy is one of the complementary therapies. The sound of nature music is created by wind, birds, rivers, and water waves (14). To address the physical, emotional, and psychological needs of patients, music therapy has been used independently of other nursing care with intervention using speakers and 40% volume dB (15). Nature sounds are one type of music that has been used by professional therapists and has been clinically proven to be able to lower anxiety levels and sleep quality of patients. Since 1984, nature music therapy has been used to reduce anxiety and improve sleep quality in patients with a wide range of diseases.

Based on the explanation above, it is important for researchers to conduct a study entitled "The Effect of Combination of Foot Massage and Nature Music on the Sleep Quality of Critical Patients", with the aim of finding out how the influence of foot massage combined with nature music to improve sleep quality.

METHODS

Study Design

This study employed a pre-experimental one-group pre-post design. This design involved administering a pretest and posttest to the same group of participants, with the intervention conducted in between. The pre-experimental design allows researchers to assess changes in sleep quality before and after the intervention without the use of a control group. Although effective in demonstrating changes due to the intervention, the absence of a control group limits the ability to attribute outcomes solely to the intervention.

Research Site and Duration

The study was conducted at Dr. Salamun Hospital, a healthcare facility that provides care for critically ill patients. The research took place between July 18 and 28, 2023, ensuring that data collection, intervention, and posttest evaluations were completed within this time frame.

Sample and Sampling Method

The study involved 16 respondents, selected using incidental sampling. Incidental sampling involves recruiting participants based on their availability during the research period, which may limit the generalizability of the findings to a broader population. The sample size of 16 provides initial insights into the effect of the intervention; however, future studies should include larger samples to enhance statistical power.

Intervention Procedures

1. **Pretest:** Before the intervention, researchers conducted a baseline measurement (pretest) to assess the initial sleep quality of each participant. This provided a reference point for comparing the effects of the intervention.
2. **Intervention:**
 - **Foot Massage Therapy:** The participants received foot massage following a standardized protocol. Foot massage is known to improve blood circulation and promote relaxation, which may enhance sleep quality.
 - **Nature Music Therapy:** Participants also listened to nature music, which included soothing sounds such as rain, waves, or birdsong. This therapy aims to reduce anxiety and induce relaxation. The combination of foot massage and nature music was carefully planned and executed to ensure consistency across all participants. Each session lasted 10 minutes for both foot massage and music therapy.
3. **Posttest:** After the intervention, the researchers conducted a final measurement (posttest) to determine the effect of the combined therapies on participants' sleep quality.

Instruments

The primary tool used to measure sleep quality was a validated sleep quality

questionnaire. Although the specific instrument is not named in the text, tools like the Richard Campbell Sleep Questionnaire (RCSQ) are commonly used to assess sleep quality in healthcare settings. The questionnaire evaluates various aspects of sleep, such as sleep latency, duration, and overall satisfaction, with higher scores indicating better sleep quality.

Data Analysis

The data were analyzed using the Paired Sample t-Test, a statistical method suitable for comparing two related samples, such as pretest and posttest measurements from the same group. This test was used to determine whether the combination of foot massage and nature music therapy resulted in a statistically significant improvement in participants' sleep quality. A p-value < 0.05 was considered statistically significant, indicating that the observed changes were unlikely to have occurred by chance.

RESULTS

This study was conducted for 18-28 days in 2023 with a sample of 16 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

Table 1.1 The age of the respondents was more at the age of >41 with a total of 11 respondents (68.8), the age of <25 amounted to 2 respondents (12.5), the age of 26-30 amounted to 1 respondent (6.3), and the age of 36-40 amounted to 2 respondents (12.5), the total number of respondents was 16. The overall gender is male with a total of 16. The education of the respondents was more high school with a total of 13, elementary school 2 and S1 1.

Table 1. Overview of Respondents' Demographic Characteristics

Characteristic	Intervention (n=16)	Percentage (%)
Age		
<25	2	12,5
26-30	1	6,3
36-40	2	12,5
>41	11	68,8
Gender		
Man	16	100
Education		
SD	2	12,5
SMA	13	81,3
S1	1	6,3

Table 2. Overview of Sleep Quality in Critical Patients

Group	N	Score	Min-Max	Average + SD
Intervention	16	Previous tests	25-75	34,24+11,932
		Post tests	78-93	85,88+4,700

Table 2 illustrates that there is an improvement in the sleep quality of critical patients with a mean pretest value of 34.24 and a mean posttest value of 85.88.

Table 3. Data Normality Test

Shapiro-wilk					
Group	N	Score	Statistics	Sig	Result
Intervention	16	Previous tests	0,639	0,297	Usual
		Post tests	0,948	0,138	Usual

Table 4. Paired Sample of T-Test Intervention (n=16)

Total score score	Meanin g+ SD	Average Difference	95% CI		t	P value
			Lower	Above		
Previous tests	34,24+ 11,932	51,637	-57,389	-45,886	- 19,13 7	0,001
Post Tests	85,88+ 4,700					

*)sig,<0.05

In table 4 Results of paired T-test samples on sleep quality in patients in hospitals. Dr. Salamun, Bandung City Based on the table above, the effect of foot massage therapy and natural music on sleep quality in patients before and after the intervention showed a significant value of two sided = <.001. If the two-sided significant value is <0.05, then there is a significant difference between the results of the pre test and post test data. It is known that the significant result of two sided = <.001 is less than <0.05. It can be concluded that using foot massage therapy methods and nature music is influential in improving the patient's sleep quality because there is a difference between the results of sleep quality in the pretest and posttest data.

DISCUSSION

This study examined the effect of a combination of foot massage and nature music on the sleep quality of critically ill patients at Dr. Salamun Hospital. The results reveal that most of the respondents were male (100%), with 81.3% holding a high school education, and the majority being above 41 years old. These

demographic characteristics align with findings from previous research, which showed that older adults tend to experience more sleep disruptions due to changes in circadian rhythms and other physiological factors. Furthermore, previous studies suggest that gender differences in sleep patterns are influenced by biological and hormonal variations between men and women. Men and women experience sleep differently due to hormonal influences, such as fluctuations in testosterone, cortisol, and melatonin, which play a role in sleep onset, quality, and duration.

Patients in this study reported several factors contributing to poor sleep quality, such as environmental disturbances, light exposure, pain, and frequent interruptions by healthcare staff. These findings are consistent with research by Kamdar (16), which found that environmental factors in hospital settings, including noise and light, significantly impact sleep quality. ICU patients frequently **report** fragmented sleep, with many only sleeping for 3-4 hours per night and experiencing daytime drowsiness due to poor nocturnal sleep (17).

The intervention involving foot massage combined with nature music demonstrated statistically significant improvements in sleep quality. The Paired Sample t-Test results showed a p-value of 0.001 (<0.05), indicating a meaningful effect of the combined therapies. This finding aligns with previous studies by Mutarobin (18), both of which demonstrated the benefits of massage therapy and nature music in improving sleep quality in ICU patients.

Foot massage has been shown to reduce cortisol levels, which helps decrease stress and anxiety, while also stimulating the release of endorphins that induce relaxation. Additionally, massage therapy can improve blood circulation and promote a sense of calm, which enhances sleep. Nature music, such as the sound of rain or waves, has also been shown to reduce sympathetic nervous system activity, lower heart rate, and increase melatonin production (19). These physiological changes support better sleep patterns in patients experiencing anxiety or pain.

Patients in the study indicated that the combination of foot massage and nature music provided a calming and soothing effect, making it easier for them to relax and fall asleep. These results are supported by research showing that nature sounds help reduce mental agitation and calm the mind, which in turn promotes faster sleep onset and longer sleep duration. The effect of massage on heart rhythm synchronization with nature music has also been found to improve parasympathetic nervous system function, thereby enhancing relaxation and sleep quality (20).

While the study demonstrated positive outcomes, it has some limitations. The sample size was relatively small (16 respondents), which limits the generalizability of the findings (21,22). In addition, the study involved only male participants, which introduces gender bias and restricts the applicability of the

results to the general population. Future studies should include a larger, more diverse sample to validate these findings and incorporate randomized controlled trials (RCTs) to strengthen internal validity (23).

CONCLUSION

This study confirms that foot massage combined with nature music therapy significantly improves sleep quality in critically ill patients. The intervention reduces anxiety and stress, improves circulatory function, and promotes relaxation by modulating hormones such as cortisol and melatonin. While the findings are promising, further research with larger, more diverse samples and control groups is needed to confirm the effectiveness of these non-pharmacological interventions across different patient populations and healthcare settings. Hospitals should also consider incorporating massage and music therapies as part of routine care for ICU patients to enhance sleep quality and improve recovery outcomes.

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