International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Effectiveness of Earplugs and Eye Masks on Quality of Sleep Among Critical Care Patients Admitted in Selected Hospital, Erode

Dr. Prof. P. Padmavathi[1], Mrs. Chandramathi. K[2], Mrs. R. Nivetha[3]

[1]P. hd (N) Principal, Principal, Dhanvantri College Of Nursing, Namakkal, Affiliated By The Tamilnadu. M.G.R Medical University, Chennai.
[2]M. Sc (N) Professor Ph.D. (N) Medical Surgical Nursing Department, Dhanvantri College Of Nursing, Namakkal. Affiliated By The Tamilnadu. M.G.R Medical University, Chennai.
[3]M.Sc. (N), Medical Surgical Nursing, Dhanvantri College Of Nursing, Namakkal. Affiliated By The Tamilnadu. M.G.R Medical University, Chennai.

ABSTRACT:
Sleep is one of the basic human needs and sleep deprivation causes numerous undesirable effects on the human body and mind, especially in the intensive care unit (ICU) patients. This study was carried out to determine the effect of earplugs and eye mask on patients' sleep quality in ICU. In this the design was Quasi- Experimental design, where pre-test, post-test Non-equivalent control group design, 30 patients in the ICU were selected by convenient sampling method and non-randomly assigned to two groups. In group A, patients wore earplugs and eye mask in the seven days during their sleep and without earplugs and eye mask in control group, and the intervention was conversely conducted in group B. Richards campbell Sleep Scales were used to measure the patients' sleep quality. The data were analyzed by paired *t*-test, mean, standard deviation, unpaired through SPSS version 18. Effect of the intervention on sleep effectiveness was positive, and there were significant differences ($P < 0.005$) between experimental group and control night, and also within each group ($P < 0.005$). Effect of the interventions on sleep disturbance was positive, and there was a significant difference in treatment compared to the control night between groups and within each group ($P < 0.005$). also, the mean scores for sleep supplementation were measured after the results showed the scores significantly increased in the intervention group compared to the control group ($P < 0.005$, ER = 47, F = 22.1). In addition, carryover effects for sleep efficiency and sleep disturbance were positive, but periodic effects for sleep efficiency and sleep disturbance were negative and positive, respectively. Conclusions: Although wearing earplugs and eye mask is a cost-effective and safe method and can improve perceived sleep quality in ICU patients, further research is needed to demonstrate the effect of this methods.

Keywords. Earplugs, eye masks, quality of sleep, critical care patients.

INTRODUCTION

One of the most important and regular tasks of human being for which they spend their one- third of life, is sleep. A good sleep is as important as a good food. The intangible nature of sleep makes it difficult to measure and can only be assessed on individual's experience. The accurate measurement of sleep is a

challenging engineering and clinical problem, as sleep monitoring system used are disturbing the sleep of subject under observation. The monitoring system for measuring sleep have to meet certain stringent specifications; sensitivity, reliability and stability to monitor brain waves, heart rate and other body parameters throughout the sleep hours. The average sleep hours vary according to age, from 14 to 8 hours depend upon number of sleep hours and sleep habits of an individual. **(Lucy bryan,2024)**

Sleep in critical care settings was demonstrated to be of a poor quality, which is associated to both environmental-related factors (artificial light, ambient noise, alarms from monitoring devices, patient-care activities monitoring, diagnostic, and therapeutic procedures) and patients-related factors (old age, underlying diseases, pain, stress, psychosis, circadian rhythm disturbances, and organ dysfunction). Evidence suggests that the poo quality sleep in critically ill patients can cause both psychological and physiological consequences and also affect the recovery and treatment. Sleep disturbances may reduce immunodeficiency function, inspiratory muscle endurance, alter patients' weaning patterns, cardiorespiratory status, and increased pain scores in critically ill patients. In addition, it can lead to negative psychological states such as agitation, confusion and delirium. **(R. Tiruvoipati 2020)**

Sleep promotion interventions include both pharmacological and non- pharmacological treatments. Pharmacological agents that induce sleep provide sedation and analgesia and are commonly used in the ICU setting. However, pharmacological interventions can have negative side effects such as impaired cognitive function, the risk of tolerance or dependency, decreased ventilation, and a disruption in normal sleep physiology. Additionally, drug-induced sleep is contraindicated in certain patient groups, such as non-ventilated patients with hypercapnic lung disease. Therefore, today there is more emphasis and recommendation on non-pharmacological interventions. However, non-pharmacological interventions for improving sleep have been found to be less effective than pharmacological methods while posing no risk of drug-related tolerance or dependency. Several non-pharmacological interventions including utilizing physical devices (eye masks and/or earplugs), relaxation techniques (massage and foot baths), music interventions, quiet time, acupuncture, and aromatherapy were attempted to improve to the quality of sleep in ICU. **(Rong Fang Hu 2015)**

STATEMENT OF THE PROBLEM:

A Study to evaluate the effectiveness of earplugs and eye masks on quality of sleep among critical care patients admitted in selected hospital, Erode, Tamilnadu.

OBJECTIVES:

1. To assess the level of quality of sleep among Critical care patients in experimental and control group before and after earplugs and eye masks.
2. To determine the effectiveness of earplugs and eye masks on quality of sleep among critical care patients in experimental and control group.
3. To find out the association between the pre test scores on quality of sleep among critical care patients in experimental and control group with their selected demographic variables.

MATERIALS AND METHODS:

In this the design was Quasi- Experimental design, where pre-test, post-test Non-equivalent control group design, 30 patients in the ICU were selected by convenient sampling method and non-randomly assigned to two groups. In group A, patients wore earplugs and eye mask in the ten days during their

sleep and without earplugs and eye mask in control group, and the intervention was conversely conducted in group B. Richards campbell Sleep Scales were used to measure the patients' sleep quality. The data were analyzed by paired *t*-test, mean, standard deviation, unpaired through SPSS version.

Tools used for the study:

There are 2 sections of tools were used. They are

1.Section A

It consists of demographic variables Age, Gender, Number of days in ICU, Previous intensive care unit experience, any intervention (vital signs checking, medication administration etc.,) by health care personnel during the night**.**

2.Section B Richards-Campbell sleep questionnaire

SCORING PROCEDURE:

Table 1 scoring procedure for the level of sleep

Level of sleep	Actual score	Percentage%
Inadequate sleep	0-33	1 – 33 %
Moderate sleep	34-66	34- 60%
Adequate sleep	67-100	61 – 100%

Ethical Consideration

1. Written permission was obtained from Director and Principal of Dhanvantri College of Nursing at Namakkal District.
2. Written permission was obtained from medical superintendent at Dhanvantri Critical Centre, Erode.
3. Prior informed consent was obtained from patients in critical care unit.

Validity and Reliability.

The content validity of the demographic variables and Richards-campbell sleep questionnaire were validated in consultation with guide and field of experts. The experts are anesthetist, Pulmonologist, Critical care physician, respiratory therapist, statistician and nurse specialist. The tool was modified according to suggestions and recommendations of the experts.

Period of data collection

The data was collected from 11-04 -2024 to 10-05-2024. The investigator collected the data from both control group and experimental group.

Pre test

Written Consent was obtained from the patient. The investigator administered Richards-Campbell sleep questionnaire for screening the patients admitted in critical care unit in control group and experimental group to assess the level of sleep

Intervention

- **Experimental Group**- Provide earplugs and eye masks at 9pm to 6am for 10 days for one month
- **Control group -** received routine hospital care.

Post test

After the 10th day, The Post - test was conducted after the intervention by using Richards-Campbell sleep questionnaire was used to evaluate the level of sleep for both experimental and control group.

DEVELOPMENT OF THE TOOL:

Section A Description of sample characteristics

Section B Assess The level of sleep Among Patients admitted in critical care unit Before and After earplugs and eye masks In Control and Experimental Group.

Section C Compare the Effectiveness of Earplugs and eye masks on quality of sleep Among Control and Experimental Group Of critical care Patients.

Area wise comparison of mean, SD, and mean percentage of control group pre and post test scores on quality of sleep.

Paired t test value of Pre and Posttest scores on quality of sleep in control group.

Section D Find out the association between posttest scores on quality of sleep among critical care patients in control and experimental group with their demographic variables**.**

Association between control group post test scores and demographic variables of quality of sleep among critical care patients.

Association between experimental group post test scores and demographic variables of quality of sleep among critical care patients

RESULTS

Section A: Description of sample characteristics according to their demographic variables.

Demographic variables	Control group		Experimental group	
	frequency	percentage	frequency	percentage
1.Age in years				
a) 21-30 years	7	46	6	40
b) 31-40 years	4	27	4	27
c) 41-50 years	7	27	5	33
2.Gender				
a) Male	6	40	7	47
b) Female	9	60	8	53
3)Number of days in ICU				
a)2 days	12	80	11	73
b)3 days	1	7	1	7
c)4 days	2	13	3	20
4)Previous intensive care unit experience				
a) Yes	3	20	2	13
b) no	12	80	13	27
5)Any intervention by the health care personnel				
a) Yes	14	19	13	87
b) no	1	7	2	13

Table 2 Frequency and percentage distribution of pre and post test scores on quality of sleep among patients admitted in critical care unit in control group (N1= 15) Level

Level on sleep	Pre test score	Post test score

	frequency	percentage	frequency	percentage
Inadequate sleep	15	100	8	53
Moderate sleep	-	-	6	47
Adequate sleep	-	-	-	-

Section C

Table 3 Area wise comparison of mean, SD, and mean percentage of control group pre and post test scores on quality of sleep.

Richard campbell sleep questionnaire	**Max score**	**Control group**						**Mean difference**
		Pre test score			**Post test score**			
		Mean	**SD**	**M %**	**Mean**	**SD**	**Mean %**	
Sleep depth	100	40.1	16.5	40	50.7	13.1	51	11
Sleep latency	100	36.4	12.0	36	50.8	11.2	51	15
Awakenings	100	38.7	18.1	39	54.9	16.1	55	16
Returning to sleep	100	40.2	10.1	30	50.4	10.8	50	20
Sleep quality	100	41.5	10.6	42	51.7	11.5	52	10
none	100	38.4	14.3	38	50.3	14.5	50	12
Total	**600**	**255.5**	**19.7**	**43**	**278.3**	**12.2**	**46**	**3**

Table 4 Paired t test value of Pre and Posttest scores on quality of sleep in control group (N1=15)

s.no	**Richard campbell sleep questionnaire**	**Paired 't' test**	**Table value**	**Level of significance**
1	Sleep depth	10.8	2.15	P<0.05 SIGNIFICANT
2	Sleep latency	8.33	2.15	P<0.05 SIGNIFICANT
3	Awakening	9.01	2.15	P<0.05 SIGNIFICANT
4	Returning to sleep	7.62	2.15	P<0.05 SIGNIFICANT
5	Sleep quality	5.08	2.15	P<0.05 SIGNIFICANT
6	None	6.3	2.15	P<0.05 SIGNIFICANT

Table 5 Association between control group post test scores and demographic variables of quality of sleep among critical care patients.

S.no	**Demographic variables**	**DF**	**Chi-square value**	**Table value**	**Level of significance**
1	Age	2	1.32	3.84	P>0.05 not significant
2	Gender	1	0.7	3.84	P>0.05 not significant
3	Number of days in ICU	2	1.35	3.84	P>0.05 not significant

4	Previous intensive care unit	2	0.77	3.84	P>0.05 not significant
5	Any intervention by health care personnel during night	2	1.8	3.84	P>0.05 not significant

Table 6 Association between experimental group post test scores and demographic variables of quality of sleep among critical care patients

S.NO	Demographic variables	DF	Chi-square value	Table value	Level of significance
1	Age	2	1.32	3.84	P>0.05 not significant
2	Gender	1	0.7	3.84	P>0.05 not significant
3	Number of days in ICU	2	1.35	3.84	P>0.05 not significant
4	Previous intensive care unit	2	0.77	3.84	P>0.05 not significant
5	Any intervention by health care personnel during night	2	1.8	3.84	P>0.05 not significant

DISCUSSION

This study was conducted to assess the effectiveness of earplugs and eye masks effective on quality of sleep to all Patients admitted in critical care unit in selected hospital, Erode

The tool used for the study consisted of

Section A: Demographic variables

Section B: Richards campbell sleep questionnaire

Distribution of samples according to their age group shows that more or less similar percentage (46% and 40%) of patients admitted in critical care unit was in the age group of 21-30 years in both the groups. However similar percentage (27%) of patients were in the age group of 31-40 years in both the groups and only 27% of patients in control group and 33% of burns patients in experimental group were in the age group of 41-50 years.

Distribution of samples according to their gender shows that, most (60% and 53%) of patients admitted in critical care unit were females in both the groups and only 40%and 47% of patients admitted in critical care unit were males. It seems that females are affected more than male.

Distribution of samples according to their number of days in ICU shows that, most (80% and 73%) of patients admitted in critical care unit were 2 days in both the groups. Only similar percentage (7%) of patients admitted in critical care unit were 3 days in both the groups. (fig 4.3)

Frequency and percentage distribution of pre and post test scores on level of sleep among patients admitted in critical care unit in control group depicts that, in pre test all 15 (100%) of the subjects had inadequate sleep, whereas in posttest 8 (53%) inadequate sleep and 47% of patients had moderate sleep.

Fequency and percentage distribution of pre and post test scores on level of sleep among patients admitted in critical care unit in experimental group depicts that, in pre test all 15 (100%) of the subjects

had inadequate sleep, whereas in posttest 12 (80%) adequate sleep and 20% of patients had moderate sleep. It seems that earplugs and eye masks were more effective among patients admitted in critical care unit

Comparison of Mean, SD, and mean percentage of control group pre and post test scores depicts that, in pre-test the highest mean score was (41.5±10.6) which is 42%, whereas in post test the mean score was (51.7 ±11.5) which is 52% in the area of sleep quality. It reveals the difference of 10%.

Paired 't' test was calculated to analyze the effectiveness between pre and post test scores of control group on different aspects on level of sleep**.** The Paired't' test score for overall was 9.8 when compared to table value (2.15) it was high. It seems that without intervention there is a less change in quality of sleep among critical care patients.

CONCLUSION:

Based on the findings of the study the following conclusions were drawn. The study findings revealed that providing of earplugs and eye masks were highly significant to improve quality of sleep among critical ill patients. There was statistically significant evidence on improvement of quality of sleep among critically ill patients.

REFERENCE:

1. Annals of Thoracic Medicine 9(4):221-226 ·
2. Heart and Lung The Journal of Acute and Critical Care 44(3) ·
3. BMJ Quality Improvement Reports 5(1):u205566.w2278 ·
4. Institute for Healthcare Improvement. 5 million lives campaign. getting started kit: prevent ventilator-associated pneumonia how-to guide. Cambridge, MA (US): Institute for Healthcare Improvement; 2010.
5. American Thoracic Society. Guidelines for the management of adults with hospitalacquired, ventilator-associated, and healthcare-associated pneumonia. Am J Respir Crit Care Med. 2005 Feb 15; 171(4):388-416.
6. Centers for Disease Control and Prevention. (2013, July). CDC/NHSN protocol clarifications. Centers for Disease Control and Prevention (CDC). (2013). Hospital-acquired infection: The burden.
7. Kollef M. Prevention of hospital-associated pneumonia and ventilator-associated
8. pneumonia. Crit Care Med 2004;32(6):1396 1405.
9. Edwards JR, Peterson KD, Andrus ML, et al. National Healthcare Safety Network (NHSN) Report, data summary for 2006 through AmInfectControl2008;36(9):609 626.
10. Coffin S, Klompas M, Classen D, et al. Strategies to prevent ventilator-associated
11. pneumonia in acute care hospitals. Infect Control and Hosp Epidemiol 2008;29:S31 S40. Dillet TH, Owens RC, McGowan JE Jr, et al. Infectious Diseases Society of America and the Society for Healthcare 112
12. Epidemiology of America guidelines for developing an institutional program to enhance antimicrobial stewardship. Clin Infect Dis 2007;44:159 177.
13. Breese Hall C, Mcbride J. Bronchiolitis. In Mandell G, Bennett J, Dolin R, eds. zPrinciples and Practice of Infectious Diseases. Philadelphia: Churchill Livingstone, 2005:820.
14. www. surgical critical care.net/resource/cpis.php.
15. T Rajasekhar, K Anuradha, T Suhasini, *V Lakshmi. The role of quantitative cultures on non-

bronchoscopic samples in Ventilator associated pneumonia. Indian J Med Microb 2006;24(2):107-1132.
16. Chastre J, Fagon JY. Ventilator associated pneumonia. Am J Respir Crit Care Med. 2002 Apr 1;165(7):867-903.
17. American Thoracic Society; Infectious Diseases Society of America. Guidelines for the management of adults with hospital-acquired, ventilator-associated, and healthcareassociated pneumonia. Am J Respir Crit Care Med. 2005 Feb 15;171(4):388-416.
18. Fartoukh M, Maitre B, Honoré S, Cerf C, Zahar JR, Brun-Buisson C. Diagnosing pneumonia during mechanical ventilation, the clinical pulmonary infection score revisited. Am J Respir Crit Care Med. 2003 Jul 15;168(2):173-9. Epub 2003 May 8.
19. Fàbregas N, Ewig S, Torres A, El-Ebiary M, Ramirez J, de La Bellacasa JP, Bauer T, Cabello H. Clinical diagnosis of ventilator associated pneumonia revisited: comparative validation using immediate post-mortem lung biopsies. Thorax 1999, Oct;54(10):867-73.
20. Woske HJ, Röding T, Schulz I, Lode H. Ventilator associated pneumonia in a surgical intensive care unit: epidemiology, etiology and comparison of three.