



EFFICACY OF EARPLUGS AND EYE MASK ON QUALITY OF SLEEP IN CARDIAC SURGICAL PATIENTS: A RANDOMIZED CONTROLLED TRIAL

Nursing

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ABSTRACT

INTRODUCTION: Adequate sleep is essential to survival of all mammals. Sleep provides necessary restorative, protective, and energy-conserving functions. Sleep abnormalities occur frequently in the Intensive care units (ICU) and the important role sleep may play in recovery of ICU patients is just beginning to be explored. Studies have proved that light and noise are barriers to good sleep in a constantly active ICU environment. The critical care nurse has the responsibility to promote sleep in ICU patients to aid in their recovery. This study was conducted with the aim to assess the efficacy of earplugs and eye mask on quality of sleep at night among patients in cardiac surgical ICU.

MATERIALS AND METHODS : In this randomized controlled trial 60 adult cardiac surgery patients were selected using consecutive sampling followed by computer generated randomization. Experimental group wore earplugs and eye mask during post operative nights while control group received routine care. Richard Campbell Sleep Questionnaire was used to assess the quality of sleep. Data was analyzed using SPSS 20.

RESULTS: Comparison of mean sleep scores in both the groups revealed statistically significant results (p value=0.0001) which extrapolates that the quality of sleep in experimental group increased due to the use of ear plugs and eye mask.

CONCLUSION: The study concluded that use of earplugs and eye mask is an effective sleep promotion strategy in intensive care unit patients

RECOMMENDATIONS: Further research on the use of earplug and eye mask is recommended in different settings including heterogeneous population and objective sleep assessment. Confounding variables like pain, anxiety and severity of illness may be included in future research

KEYWORDS

Quality of sleep, ICU, earplugs, eye mask

INTRODUCTION

Adequate sleep is essential to survival of all mammals. Sleep is a reversible behavioral state of perceptual disengagement from and unresponsiveness to the environment. Sleep is typically accompanied by postural recumbence, behavioral quiescence, closed eyes, and all the other indicators one commonly associates with sleeping⁽¹⁾

Critical illness is a time of extreme vulnerability for patients, and the important role sleep may play in recovery of intensive care unit patients is just beginning to be explored. Sleep abnormalities in the ICU include sleep deprivation and disruption as well as abnormal sleep architecture⁽²⁾. Factors affecting sleep in the ICU are numerous and include patient related factors like pain, anxiety and ICU related factors like noise, light and patient care related activities. Altered light/dark cycles, may make it difficult to achieve sleep, and alter circadian rhythms. Frequent interruptions for diagnostic tests and routine patient care also may cause frequent arousals from sleep.⁽³⁾

NEED FOR STUDY

Many ICUs have adopted various noise reduction and lighting practice to improve patient's sleep quality but there have been few objective studies to evaluate the effects of these interventions. The environment of the intensive care unit is frequently ignored as a key factor in patient well-being. As a result for many critical care environments, it may be important to accept that environmental change will take years to effect and will be expensive. Therefore, simple interventions, such as the use of earplugs and eye masks, may be a pragmatic solution for many⁽⁴⁾.

Noise is one of the most insidious environmental stressors found in the hospital environment. In the critical care unit, where patients require more frequent and more intensive monitoring, noise can be the most pervasive stressor.⁽⁵⁾ The bright artificial lighting in the critical care environment disrupts the natural circadian cycle and causes decrease in production of Melatonin, a hormone that is released in response to darkness in pineal gland of eye.⁽⁶⁾

Hadi A⁽⁷⁾ did a descriptive study to investigate the relationship between sleeping disorders and environmental factors, namely noise and lighting, and nursing interventions. He selected 30 respondents who completed a sleep disorder questionnaire. Analysis of the data showed that most respondents had disturbed sleep with noise being the leading factor of sleep disturbance followed by nursing interventions and light.

AIM OF THE STUDY

To assess the efficacy of earplugs and eye mask on quality of sleep at night among patients in cardiac surgical ICU

OBJECTIVES OF THE STUDY

1. To assess quality of sleep at night in patients admitted to cardiac surgical ICU, sleeping without earplugs and eye mask.
2. To assess quality of sleep at night in patients admitted to cardiac surgical ICU, sleeping with earplugs and eye mask.
3. To assess the efficacy of earplugs and eye mask in quality of sleep at night in patients admitted to cardiac surgical ICU

Assumptions

1. ICU patients have disturbed sleep
2. Noise and light affect quality of sleep in ICU

METHODOLOGY

A Quantitative experimental approach with randomised controlled trial design was used in a cardiac surgical intensive care unit of a selected tertiary care hospital.

60 Cardiac Surgical ICU patients who met the Inclusion criteria of age 18-80 years, GCS 15/15 were included in the study. Exclusion criteria consisted of injuries to eyes or ears, allergy to earplugs or eye mask, diagnosed sleep or neurological disorders. Consecutive sampling technique was used followed by computer generated randomization.

Tool description

Part I - Demographic profile

The demographic profile consists age, educational status, occupation and area of residence.

Surgical Details

The surgical details consisted of type of surgery, day of surgery and pain medications used

Part II Sleep Scale

The Richard Campbell Sleep Questionnaire

Data collection procedure

Researcher initially screened participants for inclusion and exclusion criteria, then approached patients about their possible participation and received informed consent. The earplugs and eye mask were applied around 10 pm and removed only as necessary for comfort or care.

Control group participants slept without earplugs and eye mask. Richards Campbell sleep questionnaire was administered at 0900 am in the morning on all the three days to both the groups

RESULTS

Tabulation of data regarding demographic variables was presented in the form percentage and frequency. The sleep scores was assessed using mean and standard deviation. Testing of hypothesis was done using t test. Mann Whitney U was used to associate demographic variables and sleep scores.

Table 1: Distribution of samples according to their socio-demographic data

n=60

Parameters		Experiment n ₁ =30		Control n ₂ =30		Total	
		f	%	f	%	f	%
Age(yrs)	18-30	4	13.33	3	10	7	11.67
	31-40	2	6.67	2	6.67	4	6.67
	41-50	3	10.00	6	20	9	15
	51-60	7	23.33	6	20	13	21.67
	61-70	12	40.00	10	33.33	22	36.67
	71-80	2	6.67	3	10	5	8.33
Educational status	Primary	6	20	7	23.33	13	21.67
	Secondary	12	40	8	26.67	20	33.33
	Higher secondary	10	33.33	13	43.33	23	38.33
	Graduate	2	6.67	2	6.67	4	6.67
Occupation	Unemployed	19	63.33	15	50	34	56.67
	Self employed	3	10	4	13.33	7	11.67
	Govt Service	8	26.67	8	26.67	16	26.67
	Private job	0		3	10	3	5
Area of residence	Rural	27	90	28	93.33	55	91.67
	Urban	3	10	2	6.61	5	8.33

Majority of the samples belonged to the age group 61 – 70 yrs of age in both the groups. 40% in the experimental group had secondary level of education whereas 43.33% had higher secondary level of education in control group. Majority of the samples in the experimental (63.33%) and control group (50%) were unemployed and 26.67% of the samples were in Government service in both the groups. Maximum of the samples i.e. 90% in Experimental and 93.33% in control group belonged to rural area of residence.

Table 2: Comparison of total sleep score on day 1, day 2, day 3 in both the groups

n=60

Sleep score on	Experimental (n1=30)		Control(n2=30)		MW test Z Value	P Value
	Mean	SD	Mean	SD		
Day 1	62.00	10.072	57.49	9.026	1.94	0.053
Day 2	72.51	6.094	65.71	7.974	3.23	0.001
Day 3	77.54	6.254	71.35	6.937	3.67	0.001

Table value Z = 1.96

On comparison of sleep score on day 1, 2 and 3 in both the experiment and control group, using Mann Whitney U test, the calculated Z Value (3.23) & (3.67) on day 2 & day 3 respectively is more than the table value (1.96) at 0.05 level of significance. This shows a highly statistical significance of sleep score between the groups with p value < 0.05.

Table 3: Comparison of total sleep score in experimental group and control group

n=60

Parameter	Experimental Group		Control Group		MW test Z Value	P Value
	Mean	SD	Mean	SD		
Sleep score	70.68	6.02	64.85	6.27	3.56	<0.0001

Table value Z = 1.96

Table 3 reveals that the quality of sleep is highly statistically significant with the p value of 0.0001 which extrapolates that the quality of sleep in experimental group increased due to the efficacy of ear plugs and eye mask.

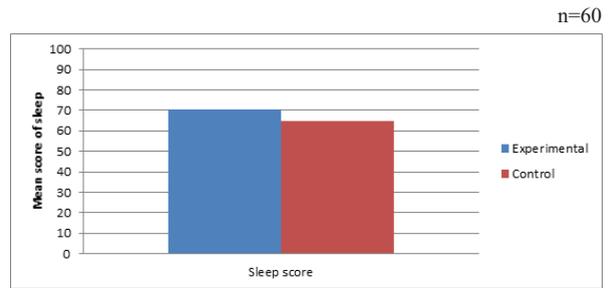


Fig 1 Comparison of mean sleep scores in both the Groups

DISCUSSION

The results are similar to the randomized controlled trial conducted by Demiray A⁽⁸⁾ et al (2018). The mean PSQI score in the control group after the operation was found to be higher than the mean PSQI score in the experimental group after the operation. The study results are supported by Dave K⁽⁹⁾ et al (2015) in the randomized control trial on ICU patients. Study conducted by Bajwa⁽¹⁰⁾ et al among 100 ICU patients revealed that application of ear plugs and eye mask shows significant effect in improving the sleep fragmentation, sleep latency, sleep quality, sleep length and sleep supplementation of critically-ill patients admitted in ICU's, which supported the findings of the present study.

Limitations

1. Sleep quality was measured using subjective assessment only.
2. Pre operative sleeping habits and sleep at home were not considered in the study

Implications

An intensive care nurse can incorporate this knowledge in daily practice to help patients sleep at night. Sleep promotion bundles can be incorporated to routine care in ICU and all patients admitted to ICU can be offered simple, low cost interventions like earplugs and eye mask for promotion of sleep. Necessary administrative support should be provided for the development of measures to improve quality of sleep in patients admitted to Intensive and critical care units. Nurse as an administrator can help formulate standard operating procedures and laid down institutional policies for the practice of sleep promotion bundles and ensure the effective practice of the same.

Recommendations

A variety of populations medical, surgical, oncology, and orthopedic patients should be studied as part of larger study with a heterogenous and larger sample. This study could be replicated with a larger sample size and different populations.

Objective assessment of sleep quality can be done to assess the effect of sleep promotion interventions in a similar setting. An extensive research may include pre operative sleep pattern of the individual and the effect it has on post operative sleep quality.

Studies on knowledge and beliefs of nurses regarding sleep among patients admitted in hospital setting may be done to identify gaps in knowledge which can be used to guide sleep education. Future research may also include assessment of pain, anxiety, stress and severity of illness as they are major confounding variables affecting quality of sleep

CONCLUSION

The study was carried out to assess the efficacy of earplugs and eye mask on quality of sleep at night among patients in ICU. The findings of the study revealed there was significant difference in the sleep score of experimental and control group thus establishing the efficacy of earplugs and eye mask in increasing quality of sleep.

REFERENCES

1. Kryger M, Roth T, Dement W. Principles and practice of sleep medicine. 5th ed. St Louis: Elsevier Saunders; 2011
2. Pisani M, Friese R, Gehlbach B, Schwab R, Weinhouse G, Jones S. Sleep in the Intensive Care Unit. American Journal of Respiratory and Critical Care Medicine. 2015;191(7):731-738.2
3. Freedman N, Kotzer N, Schwab R. Patient Perception of Sleep Quality and Etiology of Sleep Disruption in the Intensive Care Unit. American Journal of Respiratory and Critical Care Medicine. 1999;159(4):1155-1162.3
4. Mills G, Bourne R. Do earplugs stop noise from driving critical care patients into delirium?. Critical Care. 2012;16(4):139.
5. Kaplow R, Hardin S. Critical care nursing. Sudbury, Mass.: Jones and Bartlett; 2007.

6. Castro R, Angus D, Rosengart M. The effect of light on critical illness. *Critical Care*. 2011;15(2):218.
7. Hadi A. Factors affecting sleep disorders of the patients in the intensive care unit. 2nd International Conference on Applied Science and Health. 2015. 7
8. Demiray A, Khorshid L. The effects of eye masks and earplugs on the sleep quality and anxiety of hospitalized patients-a randomised controlled trial. *Clinical Practice*. 2017;15(1)
9. Dave K, Qureshi A, Gopichandran L. Effects of Earplugs and Eye Masks on Perceived Quality of Sleep during Night among Patients in Intensive Care Units. *Asian Journal of Nursing Education and Research*. 2015;5(3):319.
10. Bajwa N, Saini P, Kaur H, Kalra S, Kaur J. Effect of earplugs and eye mask on sleep among ICU patients: A randomized control trial. *International journal of current research*. 2015;7(12)