Effectiveness Of Sleep Hygiene On Sleep Quality, Anxiety and Incidence Of Cardiac Dysrhythmia Among Patients With Myocardial Infarction

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Abstract

Background: Impaired sleep may be a mediator of prognosis in chronic cardiovascular disease. Early sleep hygiene interventions integrate evidence-based practice to improve cardiovascular status. **Purpose***:* To examine the effect of sleep hygiene on sleep quality, anxiety and incidence of cardiac dysrhythmia, among patients with myocardial infarction (MI)**. Design:** Study /control group quasi-experimental design was used. **Sample:** The study was carried out on a purposive sample of 100 adult patients with acute myocardial infarction in CCU. **Setting:** Coronary care units at Menoufia University Hospital, Egypt. **Instruments:** 1) A semi-structured socio-demographic and medical data sheet; 2) Pittsburgh Sleep Quality Index (PSQI); 3) Insomnia Severity Index (ISI); 4) State-trait Anxiety Inventory (SAI); and 5) follow-up sheet for the number of premature ventricular and atrial contractions (PVCs & PACs). **Results**: There is a highly statistically significant reduction in the total mean score of PSQI in the study group (4.72±1.33) compared to the control group (16.82±1.95) (p<0.000) post-intervention. Also, there was a highly statistically significant decrease in the mean score of ISI in the study group (8.72±7.28) compared to the control group (15.98±7.56) (p=0.000) post-intervention. The study group had a statistically significant decrease in the total mean score of anxiety post-intervention (36.30 ± 9.17) compared to the control group (42.82±11.96) (p=0.003). Additionally, A statistically significant decrease was found post-intervention in the number of PVCs and PACs in the study group (2.61±1.77 & 1.39±0.87) compared to the control group (5.020.49 and 2.991.33); the P values were 0.002 and 0.003, respectively. **Conclusion**: Sleep hygiene interventions have a positive effect on improving sleep quality, reducing anxiety and insomnia, and decreasing the number of PVCs and PACs in patients with MI. **Recommendation:** Develop clinical practice guidelines for critical care nurses to apply sleep hygiene interventions as standard care for patients with MI.

Keywords: : Sleep hygiene, Sleep quality, Anxiety, Cardiac dysrhythmia, Myocardial Infarction.

Introduction

The most typical diagnosis for individuals admitted to cardiac Care Units (CCU) is Acute Myocardial Infarction (AMI). More than half of patients with AMI had sleep disturbances at admission assessed with validated tools such as the Pittsburgh Sleep Quality Index (PSQI) and the Insomnia Severity Index (ISI). Sleep Deprivation (SD) can significantly increase the morbidity and mortality of coronary heart disease **(Von Känel et al., 2022; Madsen et al., 2019)** because it has serious negative effects on the cardiovascular system, including an increased risk of MI, oxygen demand in the heart, and cardiac arrhythmias **(Li et al., 2021; Badran et al., 2015).**

Up to 20% of Myocardial Infarction (MI) presentations are complicated by sustained ventricular arrhythmia, which is also linked to a poor prognosis **(Shah et al., 2021; Thomas et al., 2017).** Recent research has linked arrhythmias to a number of sleep-related behaviors, including excessive daytime drowsiness, poor sleep quality and insomnia **(Ashghab et al., 2018).**

The researchers also reported that Acute Coronary Syndrome (ACS)-induced symptoms of anxiety and insomnia are widespread among patients with ACS and are linked with negative clinical outcomes **(Princip et al., 2023; Shajrawi et al., 2022).** Early assessment and management of sleep deprivation have played an essential role in

reducing the harmful consequences of AMI **(Wei et al., 2022).**

The prevalence of sleep impairment in CCU patients may be caused by a variety of factors, including environmental sounds, temperature, lighting, nursing interventions, telephone ringing, staff members talks and patients' being connected with monitoring systems, an improper bed, and disregard for routines before bedtime. One non-pharmacological strategy to help patients in coronary care units have a decent night's sleep and remain fully attentive during the day is sleep hygiene **(Salavati et al., 2017).**

The way a person sleeps affects many aspects of their life, including their emotional, cognitive, and psychomotor performance, and is crucial to good health **(Louzon et al., 2022)**. Sleep hygiene is essential to maintain and regulate cardiovascular function. When patients get adequate sleep, the heart rate and blood pressure go down, permitting the heart and vascular system to rest and repair **(Bigalke et al., 2022)**.

The nurses in critical care units face significant difficulties in promoting sleep for critically ill patients. This is due to loud noises, constant activity throughout the night, and continuous artificial lights. The environment of these units does not help with sleep. Promoting sleep in these patients should be a top priority for the nurses in intensive care units, and sleep should be a focus during the day and night in order to maintain a normal circadian rhythm for patients **(Louzon et al., 2022).** Additionally, a number of clinical studies revealed that practicing good sleep hygiene might be a viable remedy for improving sleep pattern and prevention of dysrhythmias ‘’Premature Ventricular Contractions (PVCs) and Premature Atrial Contractions (PACs)” after MI **(Beck Edvardsen and Hetmann, 2020)**.

Significance of the Study

In the CCU, sleep disorders, particularly insomnia, are often observed in clinical practice. Only a few research studies have looked into clinical insomnia in MI, despite the fact that this condition clearly contributes to sleep disturbance, cardiac dysrhythmia, and thus presents targets for intervention **(Tobaldini et al., 2019)**. Getting more restful sleep improves patients' physical and psychological conditions, maintains and regulates cardiovascular function **(Hanson & Huecker, 2022).** A critical care nurse is in a good position to advise patients on good sleeping habits. The advantages of using sleep hygiene interventions are the foundation of this study. Therefore, the purpose of the study is to examine the effectiveness of sleep hygiene on sleep quality, anxiety and incidence of cardiac dysrhythmia among patients with myocardial infarction.

Purpose of the Study

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Research Hypotheses:

- Patients who receive sleep hygiene are expected to have improvement in sleep quality than the patients who receive routine hospital care.
- Patients who receive sleep hygiene are expected to have a lower insomnia score than the patients who receive routine hospital care
- Patients who receive sleep hygiene are expected to have reduction in in anxiety level than the patients who receive routine hospital care.
- . Patients who receive sleep hygiene are expected to have a less incidence rate of PVCs and PACs than patients who receive routine hospital care

Methods

Research Design :

A quasi-experimental (study/ control) was used.

Setting:

The current study was carried out at the University Hospital's Coronary Care Units, Shebin EL-Kom, Menoufia Governorate, Egypt.

Sampling

A purposive sampling of 100 critically ill adult patients admitted with MI were recruited from University Hospital's Coronary Care Units and agreed to participate in the study and fulfill the inclusion criteria. The chosen patients were split into two groups of similar size, each with 50 patients: the study group received sleep hygiene intervention along with routine hospital care, and the control group received standard care only, which

included decreasing the loud speech and dimming the lights. The selected inclusion criteria included; adult patients (aged 18–60 years), both sexes, suffering acute inferior MI, fully conscious; no pain from non-cardiac diseases; no addiction to opioids or sleeping medications; not receiving medical treatment or any procedure that influences sleep; lack of previous sleep disorders, and their hospitalization lasting at least five days. Patients with any of the following conditions were not eligible to participate in the experiment: patients with pain or consumption of narcotics during the night; patients with long-term PVCs that needed medical treatment because these conditions may result in bias and inaccuracy in the study results.

Sample Size Calculation:

Appropriate sample size was determined using Slovin's Formula which provides a sample size calculator using the following values: level of confidence, population size, and margin of error. The sample size was calculated to be 97 patients, which was increased to 100 to raise the power of the study.

$$n = \frac{N}{1 + N(e)^2}$$

Where; n= sample size; N= total population number (128); e= margin of error (0.05).

sample.

Instruments for Data Collection:

Four instruments were used for data collection as follows:

Instrument (1) A Semi-structured Socio-Demographic and Medical Data Sheet :

It was designed by the researcher to gather information on patients' age, gender, education level, marital status, and smoking, associated chronic condition, physical activity and types of MI.

Instrument (II) Pittsburgh Sleep Quality Index (PSQI):

It is a 19-item questionnaire the developed **by Buysse et al., (1989)** to measure sleep disruptions and quality over three days. The first four items are open-ended, while items five through nineteen are assessed on a Likert scale with a rating range of 0 to three. Scores for individual elements provide 7 components. Scoring system: The 7 components scores are added to provide a final score, which ranges from 0 to 21. A score >5 signifies bad sleep.

Validity and reliability of The PSQI: The PSQI questionnaire was tested for reliability by **Backhaus et al., in 2002**, and they found that it has good validity for patients with primary insomnia and high test-retest reliability. The overall PSQI global score correlation coefficient for test-retest reliability was.87, and a PSQI global score > 5 resulted in a sensitivity of 98.7 and specificity of 84.4 as a marker for sleep disturbances.

Instrument (III) Insomnia Severity Index (ISI):

The ISI was developed by **Morin (2001)** to assess the severity of insomnia. It consists of seven questions that evaluate the perceived seriousness of difficulties falling asleep, staying asleep, and awakenings in the early morning hours, satisfaction with the current sleep pattern, interference with daily functioning, noticeability of impairment attributed to the sleep problem, and level of distress or concern brought on by the sleep problem . Each item is scored between 0 and 4, with an overall score ranging from 0 to 28. The total score is denoted by the following: 0-7 indicates No clinically significant insomnia, sub threshold insomnia in the range of 8 to 14, clinical insomnia in the range of 14 to 21 (moderate severity), and clinical insomnia in the range of 22 to 28 (severe).

Veqar & Hussain (2020) tested the tool's reliability, they found that the ISI's test-retest reliability (intra-class correlation coefficient = 0.84 was excellent) and internal consistency (Cronbach's α–0.84) were both excellent. They came to the conclusion that the ISI is a reliable and acceptable tool to detect insomnia.

Instrument (IV) State-Trait Anxiety Inventory:

It was developed by **Pamela et al., (2002)** to assess anxiety levels. The most important descriptions were feelings at a given moment to determine anxiety level caused by external pressure A 4-point rating system is used for all items. Each item is rated as 1 (Not at all), 2 (somewhat), 3 (moderately so) and 4 (very much

so). It includes 20 questions, with scores ranging from 20 to 80. STAI scores were classified as a follow: "no or low anxiety (20-37), "moderate anxiety (38-44) and high anxiety (45-80)".

Validity and reliability:

Gustafson, et al., (2020) told; construct validity of the tool was satisfactory with a Cronbach's alpha of 0.93 and With an intra-class correlation coefficient of 0.80.

Instrument (V) Follow up Sheet for Number of PVCs and PACs.

The researcher designed it to keep track and record of how many PVCs and PACs occurred throughout the course of 6-hours per day during the period of the study.

Data Collection Procedure:

After explaining the purpose of the study, approval was obtained from the hospital director and the head nurses of the cardiac care units in the setting.

Prior to data collection, a **pilot study** involving ten patients was conducted to assess the objectivity, clarity, applicability, and feasibility of each instrument. The study also sought to establish the time needed for data collection and to address any issues related to the use of the instruments. Adjustments were then made according to the results obtained. The final analysis did not include any patients who took part in pilot study.

Data were gathered over a six-month period, starting in beginning of August 2022 to the end of January 2023. The researcher conducted interviews with participants who met the requirements for inclusion criteria, and data was gathered using the designed instruments. One hundred critically ill adult MI patients were divided and assigned into two equal groups, each with 50 patients. To avoid data tampering, the researcher handled the control group first. Following the completion of data collection for the control group, researchers handled the study group and administered the sleep hygiene interventions.

Patients in the two groups were interviewed individually by the researcher in the CCU before starting the session of therapy for gathering baseline data by completing; socio-demographic questionnaire and medical data; PSQI to assess sleep quality ISI to detect the insomnia; and STAI to assess anxiety level.

All patients in the two groups received instructions on how to keep leads of cardiac monitor from separating and to rest as much as possible throughout the days of hospital stay. Measurements of the PVCs and PACs counts were made throughout a 6-hour period during the day by working with a cardiologist and utilizing the apparatus memory. On the second day of their hospital stay, measurements of the PVCs and PACs counts were made, and considered as a baseline data before the intervention.

For three Consecutive nights starting from the second night of admission, the patients in the study group instructed to follow sleep hygiene interventions but the control group followed standard hospital care.

The sleep quality and insomnia severity and The anxiety level were evaluated in the two groups in the fifth day by using the instruments II,III and IV by and the mean of PVCs and PACs number in the third and fourth, days of admission after the intervention were calculated. To achieve the study's goal, the pre and post-intervention data were compared between the experimental and control groups.

Sleep Hygiene Interventions for the Study Group:

The patients in the intervention group were asked to followed sleep hygiene interventions where they were asked to modify their activities and caring behaviors according to the patient's sleep habits and needs (i.e., decreasing their loud speech, decreasing the environmental light and noises, and using light blinker telephone apparatus instead of the ringing ones). Patients were also instructed to avoid using cell phones and materials such as tea, coffee 6 hours before sleep time and heavy foods 2–3 hours before sleep time. They were also educated not to think of their life problems and hassles and try some tranquil activities such as praying, reading books or newspapers, tooth brushing or having a cup of milk before bedtime. Moreover, the beds, bed sheets and coverlets were modified according to their desires.

Ethical Considerations

The researcher obtained approval to conduct the study from the Research Ethics Committee of the Faculty of Nursing, Menoufia University (the approval number is 919). The study's participant provided written consent in order to participate. The protocol and advantages of taking part in the study were explained to the patients. The coding of all data and the storage of all collected data sheets in a safe cabinet ensured the confidentiality and anonymity of patient information. , The study's participants' involvement is entirely voluntary, as the researchers underlined. Additionally, subjects were informed that declining to take part in the study would not affect their level of care.

Data Analysis:

Statistical Package for Social Science version 25 for Windows was used to tabulate the data and perform statistical analysis. The qualitative data was presented as frequency and percentages for each category, and the Chi-square test (x2) was used to compare the two groups and more. In order to compare the means of two sets of parametric data from independent samples, a student t-test was performed for quantitative data; a P-value ≤ 0.05 was used as the level of significance.

Results

Table (1) describe sample characteristics and showed that the average ages of the study group and control group members were (47.60±9.65) and (47.4±69.74), respectively. In terms of gender, men made up more than half of participants in both groups. In both the intervention and control groups, the majority of patients were married. Both groups' participants have a high level of education, with corresponding percentages of 30.0% and 38%. In both the control group and the research group's participants 64% &70%, respectively smoke. Around 74% and 70%, respectively, of the patients in the experimental and control groups had diabetes mellitus.

Table (2): It is obviously noted that, prior to the intervention, there was no statistically significant difference between the two groups in terms of the overall mean score for sleep quality, with a P value of 0.698. On the other hand, a highly statistically significance difference was found between the two groups regarding to total mean score of sleep quality after intervention (P value = 0.000).

Table (3): It is obvious that, no statistically significant difference in the overall ISI score between the two groups prior to the intervention (p value = 0.586). But after the intervention, the study group had a significantly lower overall mean score for insomnia than the control group (p value = 0.000).

Figure (1): illustrates the insomnia levels pre and post intervention. After the intervention, there was a statistically significant decrease in the experimental group's level of insomnia compared to the control group.

Table (4): demonstrates that there was no statistically significant difference in the pre-intervention mean anxiety scores between the two groups. On the other hand, following the intervention, there was a highly significant decrease in the mean anxiety score between the two groups (P value = 0.003.

Figure (2): illustrates the anxiety levels pre and post intervention. Following the intervention, there was a statistically significant decrease in anxiety levels in the study group compared to the control group. Forty eight percent of the individuals in the study group had no or low anxiety compared to 32% in the control group and 40% of the participants in the study group had moderate anxiety compared to 26% in control group. Additionally, 12% of the study group, compared to 42% of the control group, had high levels of anxiety.

Table (5): It is evident that there was no statistically significant difference in the number of PVCs and PACs between the two groups prior to the intervention (p value = 0.84 & 0.46, respectively). Conversely, The number of PVCs and PACs in the study group decreased significantly after the intervention compared to the control group, with p values of 0.002, 0.003, respectively.

Table (1): Distribution of Socio-demographic characteristics and Medical data of the Studied Sample (N=100).

Variables	Study Group No.	Percent	Control Group No.	Percent	P value
Age groups					
o <40	11	22	10	20	
o 40-50	15	30	15	30	
o >50	24	48	25	50	
X ± SD	47.60 ± 9.65		47.46 ± 9.74		0.94
Gender					
o Male	28	56	30	60	0.67
o Female	22	44	20	40	
Marital Status				82	
o Married	40	80	41	8	0.77
o Widow	6	12	4	10	
o Single	4	8	5		
Level of Education					
o Illiterate	9	18	7	14	
o Primary education	11	22	12	24	0.79
o Secondary education	15	30	12	24	
o High education	15	30	19	38	
Smoking					
o Smoker	35	70	32	64	0.52
o None smoker	15	30	18	36	
Physical activity					
o Physically active	10	20	12	24	0.63
o Physically inactive	40	80	38	76	
Type of MI					
o without ST	29	58	22	44	0.16
o with ST	21	42	28	56	
Associated diseases					
Diabetes Mellitus	37	74	35	70	0.66
Hypertension	34	68	33	66	0.83
hypercholesterolaemia	30	60	28	56	0.69

Significance at p values ≤0.05

Table (2): The Effect of Sleep Hygiene Intervention on Sleep Quality among Study and Control Groups before and after Intervention (N=100).

Variables	Study Group (N = 50) X± SD	Control Group (N = 50) X± SD	t & P value
Total mean score of PSQI pre- intervention	17.16 ± 1.80	17.30 ± 1.80	t = 0.389 p = 0.698
Total mean score of PSQI post intervention	4.72 ±1.33	16.82 ± 1.95	t =36.351 p = .000**

(*) Statistically significant at P ≤ 0.05 (**) High significant at P value <0.001

Table (3): The Effect of Sleep Hygiene Intervention on Insomnia among Studied Sample before and after Intervention (N=100).

Variables	Study Group X± SD	Control Group X± SD	t & P value
Total score of ISI before intervention	18.34 ± 7.08	17.5 ± 8.25	t = 0.546 p = 0.586
Total score ISI after intervention	8.72 ± 7.28	15.98 ± 7.56	t = 4.89 p = .000**

(*) Statistically significant at P ≤ 0.05 (**) High significant at P value <0.001

Figure (1): Distribution of the insomnia levels among the study and control groups pre and post intervention (N=100).

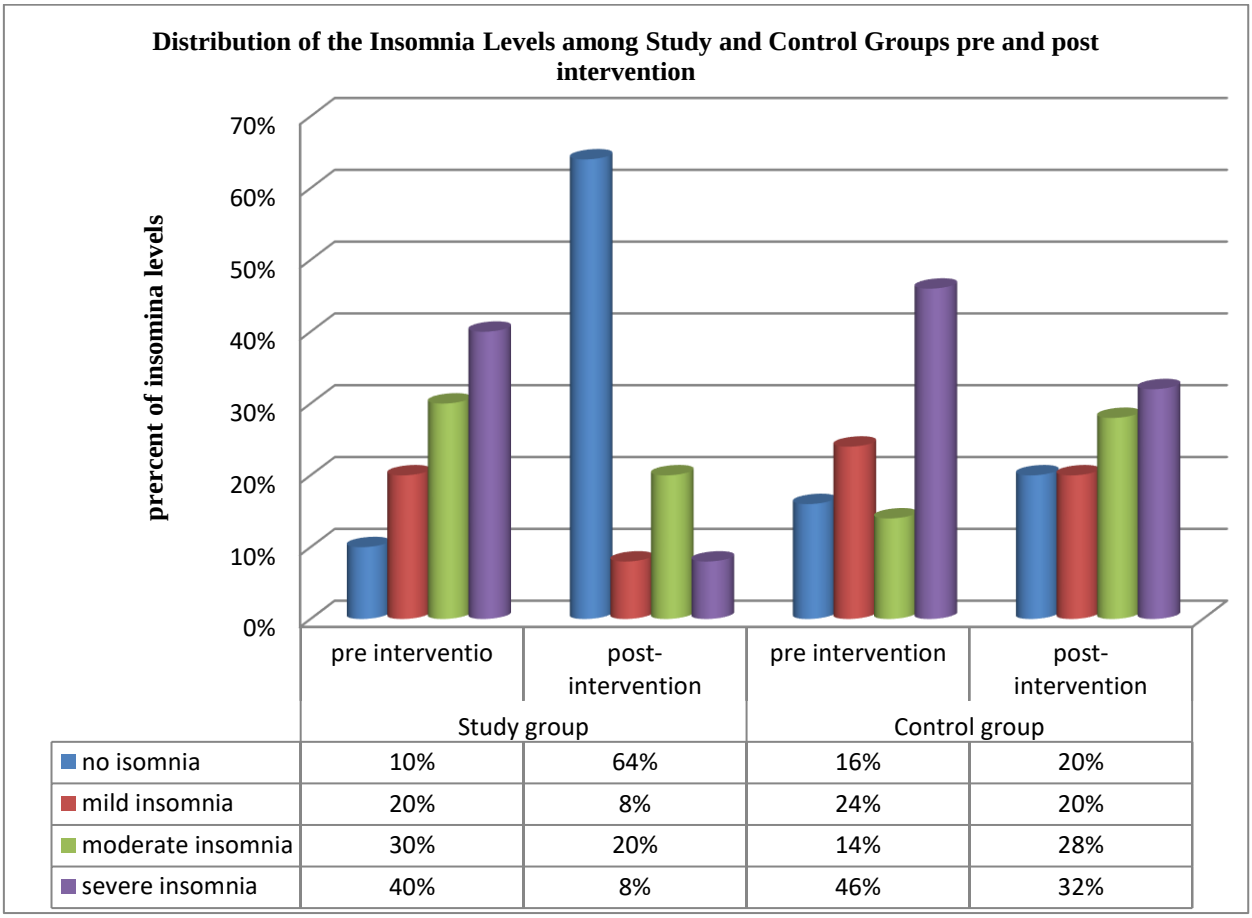

Table (4): The Effect of sleep hygiene intervention on anxiety level within Sample of study before and after Intervention (N=100).

Variables	Study Group (N = 50) X± SD	Control Group (N = 50) X± SD	t &P value
Anxiety score pre-intervention	53.94 ± 14.55	52.70 ± 15.67	t = 0.410 p = 0.683
Anxiety score post-intervention	36.30 ± 9.17	42.82 ± 11.96	t = 3.06 p = 0.003*

(*) Statistically significant at P ≤ 0.05 (**) High significant at P value <0.001

Figure (2): Comparison between Study and Control Groups in Relation to the Severity of Anxiety before and after Intervention (N=100).

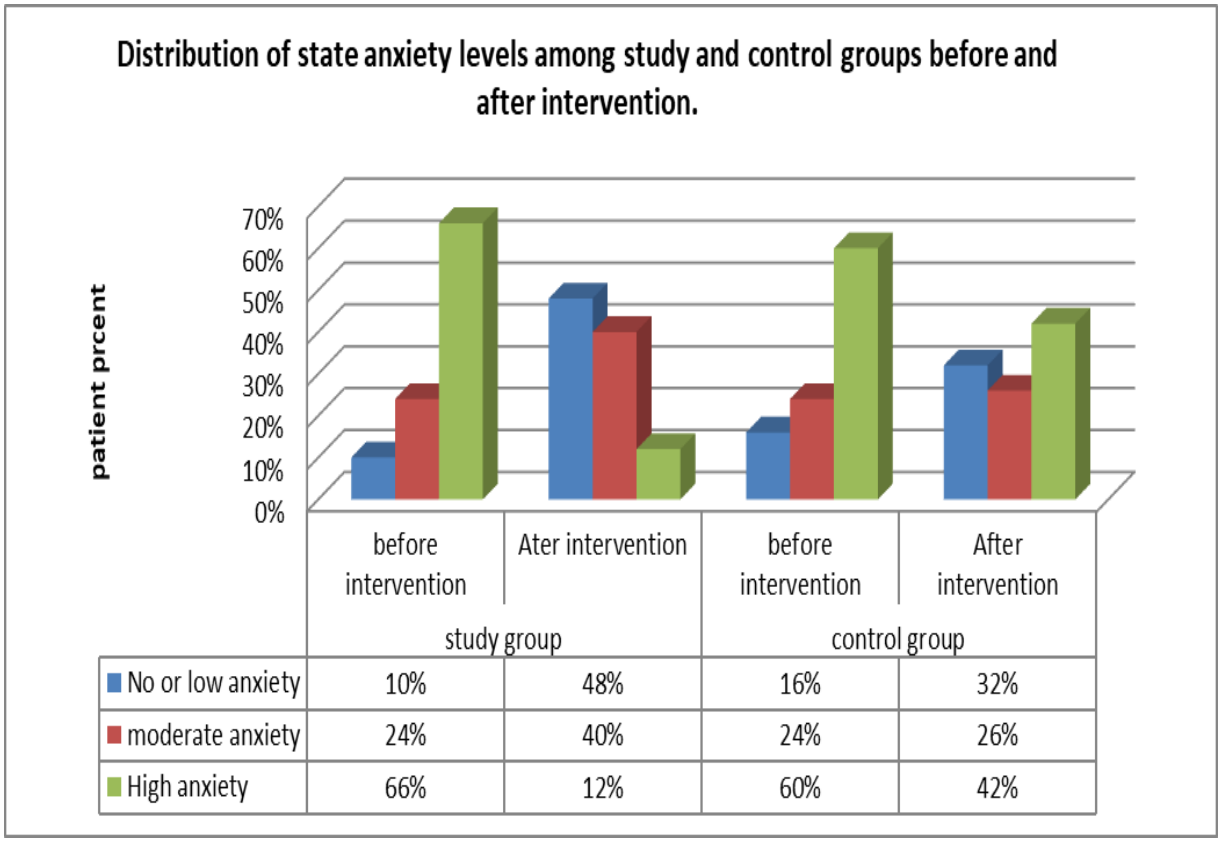

Table (5): The Effect of Sleep Hygiene Intervention on Numbers of PVCs and PACs among Studied Sample before and after Intervention N (100).

Variables	Study Group X± SD	Control Group &X± SD	P value[B]
Number of PVCs before intervention	5.46± 2.02	5.32± 3.75	p = 0.84
Number of PCVs after intervention	2.61±1.77	5.02± 0 .49	p = .002*
P value[A]	0.004	0.11	
Number of PACs before intervention	3.11 ± 1.05	3.07 ± 1.99	p = 0.46
Number of PACs after intervention	1.39± 0.87	2.99± 1.33	p = 0.003*
P value[A]	0.005	0.47	

(*) Statistically significant at P < 0.05 ** High significant at P value

P value[B] student t-test

P value[A] Paired t-test.

Discussion

Sleep deprivation has been related to the induction and maintenance of arrhythmias because it may disrupt the autonomic nervous system's balance of sympathetic nerve and vagal outflows **(Qi, 2020; Gallagher et al., 2021)**. A healthy lifestyle and a physically and mentally productive existence are both dependent on having good sleep **(Jackson et al., 2018)**. Numerous MI patients experience sleep problems, which impair their immune system's ability to fight infection and result in inflammatory diseases. As a result, the patient is more vulnerable to clinical sequelae and has a worse prognosis **(Garbarino et al., 2021).** Therefore, in this study, we apply sleep hygiene to patients with MI and analyze its impact on these patients' sleep quality, anxiety levels, and incidence of arrhythmia.

Regarding to the Socio-demographic Characteristics and Medical Data of the Studied Groups

Most of the sample during the study was over 50 years old. This finding was consistent with the results of **Gallagher et al. (2021)**, who reported that age increased the risk for MI. Males comprised the majority of the study sample. This finding is in keeping with **Lloyd-Jones (2021)**, who stated that men and women are affected by coronary artery disease nearly equally, but that men may experience the condition sooner in life. In both experimental and control groups, smoking was prevalent. This result is similar to that of **Full et al. (2020)**, who examined the risk factors for insomnia and found that heavy smoking was a risk factor for sleep disorders in MI patients

Effect of sleep hygiene Intervention on the Sleep Quality

The study found that, the PSQI mean score post-intervention was significantly lower in the study group, indicating that the patients in the study group had better sleep quality than control group, this in keeping with previous studies by **Gallagher et al., (2021) and Full et al., (2020)** who found similar results in patients with MI who had insomnia. The finding also was along the lines of **Qi, (2020**) who investigated how a sleep hygiene program affected the quality of sleep in 120 patients with myocardial infarction and suggested that the application of a sleep hygiene program improved sleep quality.

However, our study finding was not in line with the outcomes reported by **Lin et al., (2015).** They evaluated efficiency of sleep hygiene intervention on sleep quality among patients with MI and found that sleep hygiene intervention had limited effect on improving sleep quality in both groups post intervention. A potential reasoning of **Lin's** research findings can be related to the small size of the used sample and the heterogeneity of the critically ill patients who participated in his study.

The Effect of sleep hygiene Interventions on the Severity of Insomnia:

The study results revealed a significant reduction in the mean score of the ISI in favor of the sleep hygiene group post-intervention. This finding confirmed the hypothesis that patients receiving sleep hygiene interventions have a decreased in the severity of insomnia compared to the control group. The results are consistent with **Li et al., (2021)** and **Song et al., (2017)** who found a significant decrease in insomnia score in the sleep hygiene group compared to the control group.

This finding was also consistent with **Theodora et al., (2021)** who examined sleep hygiene practices for managing chronic insomnia in MI patients. Sleep hygiene interventions, including reducing caffeine and nicotine intake, avoiding daytime napping, and maintaining a quiet environment, help patients sleep soundly.

In contrast, the study finding was different from what was found by **Khalladi et al., (2019)** who reported that sleep hygiene intervention didn't help to reduce insomnia level among patients with MI. A possible reasoning of **Khalladi**'s study outcomes may be because of the majority of small have others chronic disease and the severity of illness of the participants (severe sepsis and acute respiratory distress syndrome).

Effect of Sleep Hygiene Intervention on Anxiety

The current study hypothesized that patients who receive sleep hygiene intervention are more likely to have decreased severity of anxiety than

those who don't receive sleep hygiene intervention (the control group) and the study results confirms the hypothesis. The results align with previous studies by **Theodora et al., (2021) and Li et al., (2020)** which also found a significant decrease in anxiety levels after sleep intervention, confirming the positive impact of sleep hygiene on anxiety levels.

The results of the present study contradict those of **Khalladi et al., (2019)** and **Lin et al., (2015)** who found that sleep hygiene interventions was enjoyable but had no significant impact on anxiety levels in 80 patients with myocardial infarction. From the researcher's point of view, the short-term duration of the intervention may provide one explanation for the study's findings.

Effect of sleep hygiene Intervention on the Number of (PVCs) and (PACs)

The study found that sleep hygiene interventions significant reduction the PVCs and PACs number in patients of experimental group post intervention. This finding aligns with previous research by **Salavati et al., (2017)** which also found a significant decrease in frequency of PVCs and PACs in patients with myocardial infarction. The study suggests that sleep hygiene interventions may have positive effects and reduced the cardiac dysrhythmia among patients with myocardial infarction. From the researcher's point of view that this may be due to adequate sleep duration, no insomnia, and low anxiety levels are independently effect on cardiac status, this view was supported by studies **by Li et al., (2021) and Chokesuwattanaskul et al., (2018)** who found that the good sleep habits can prevent cardiac arrhythmias and cardiovascular problems during myocardial infarction.

The study differs from **Lin et al., (2015)** who investigated the role of sleep hygiene in preventing cardiac dysrhythmia and found no significant reduction in PVCs post-intervention due to statistical limitations and potential misclassification.

In an attempt to interpret study results, from the researchers' perspective, the application of sleep hygiene by the study group's patients resulted in better sleep quality and less insomnia, which in turn eliminated the negative effects of insufficient sleep associated with the release of some neurotransmitters like epinephrine and norepinephrine. In addition to raising anxiety, irritation, and rage, these neurotransmitters can additionally increase heart rate and arrhythmia risk **(Fontana & Pittiglio, 2010).** As a result, the experimental group's arrhythmia and anxiety levels have improved.

Limitation of the study

- The results of our present study are limited in the generalizability due to the convenient sample. Lack of randomization of the sample can cause bias in sample selection and limit the popularization of the outcomes.
- Participants were enrolled from a single hospital; therefore, resulting data must be interpreted carefully.

Conclusion

Study groups with myocardial infractions who underwent the sleep hygiene intervention reported improved sleep quality, decreased anxiety levels, fewer PVCs and PACs, and less severe insomnia.

Implications for Clinical Practice:

Develop clinical practice guidelines for critical care nurses to apply sleep hygiene interventions as standard medical care for patients with myocardial infraction to improving sleep quality, lowering anxiety levels, and reducing the number of PVCs and PACs among study group patients.

Implications For Future Research

Future research in various ICUs will use sleep hygiene to enhance the quality of patients' sleep that are critically ill.

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Conflict of interest:

No potential conflicts of interest

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