Original Article

# The effect of adjustment of environmental factors on sleep quality of patients admitted to the cardiology unit of Shahid Modarres Hospital of Saveh

**Zahra Maddah[1], Neda Fayazi[2]*, Ahmadreza Abedi[3], Mahmood Karimy[4], Mahboobeh Sajadi[5], Vahid Naseri Salahshour[6]**

[1] Instructor, Dept. of Psychiatric Nursing, School of Nursing and Midwifery, Saveh University of Medical Sciences, Saveh, Iran. [2] Instructor, Dept. of Critical Care Nursing, School of Nursing and Midwifery, Saveh University of Medical Sciences, Saveh, Iran. [3] Instructor of Nursing Department of Nursing, School of Nursing, Arak University of Medical Sciences, Arak, Iran. [4] Associate Professor, Dept. of Health Education, School of Nursing and Midwifery, Saveh University of Medical Sciences, Saveh, Iran. [5]Associate Professor, Dept. of Medical - Surgical Nursing, School of Nursing and Midwifery, Arak University of Medical Sciences, Arak, Iran. [6] MSc. Stu of Medical - Surgical Nursing, School of Nursing and Midwifery, Arak University of Medical Sciences, Arak, Iran.

**Correspondence:** Neda Fayazi, Instructor, Dept. of Critical Care Nursing, School of Nursing and Midwifery, Saveh University of Medical Sciences, Saveh, Iran.

## ABSTRACT

Introduction: Sleep is one of the basic human needs, that any disorder affecting one's body systems. Due to the high prevalence of sleep disorder in patients admitted to the cardiac care unit and considering that the most important factors affecting the sleep such as light and noise we decided to investigate the effect of adjustment of environmental factors on the quality of sleep in patients admitted to the CCU. Methods: This is a clinical trial in which 70 heart patients were randomly divided into two groups of control and intervention. At the beginning of the study (3 days after admission), for both groups, the Peterbosbug standard sleep quality questionnaire were completed for the first time. Then, for intervention group, moderate environmental factors and Then, 3 days after the above interventions (the 6th day of admission), the sleep quality questionnaire was completed again. For the control group, without creating any changes in the environmental conditions of the unit, and in the same routine physical environment, the questionnaires were completed at the same intervals. The results were analyzed using descriptive tests and inferential statistics. Results: The mean sleep quality in the intervention group before and after the intervention was 42.3±14.20 and 57.3±15.30, which was statistically significant ($p = 0.001$) and in the control group before and after the intervention was 43.1±12.12 and 47.15±11.9 that was not statistically significant. ($p = 0.2$). Conclusion: According the results, adjustment of environmental factors can increase the quality of sleep and can be used as one of the non-pharmacological and effective methods for improving sleep quality.

**Keywords:** Sleep quality, Environmental factors modulation, Cardiovascular diseases.

## Introduction

Sleep is a physiological process that, according to the pyramid, Mazlo's needs are one of the most basic human needs [1-4], which will restore the body's overall body and the recovery process, as it leaves the person from stress and responsibility and during these hours the process of rebuilding of cell is formed. [2, 4-6] Sleep from ancient times has been considered as an effective and powerful factor in health [2, 3, 7, 8]. In the world, between 45% and 30% of people suffer from insomnia [3, 8] and the prevalence of sleep disorders among individuals is 42- 15%. [8] In the study of Jafarian et al., The majority of patients (63.6%) had poor sleep quality. [3] Another study found that 56% Patients suffer from sleep disorders from the very first day of admission [4, 6]. Sleep affects all systems of the body, including the immune system, digestion, nerves, and so on. Sleep disturbances lead to problems such as weakness, fatigue, irritability, lack of concentration, exacerbation of the disease, reduced pain tolerance, decreased daily function [2, 3, 6-9].

Sleep disturbance can have negative effects on the illness, and reverse [3] the kidney of the hospitalized patients suffers from sleep disorder, although it seems that sleeping hours are

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daytime, but their sleep is not high quality and does not result in the necessary physical and mental regeneration [8] On the other hand, in the course of illness, the body needs to sleep is very. [2] During the waking, heart of healthy person rate an average of 80-70 times per minute, which decreases about 60 times during sleep, according to which sleep have been identified as a useful agent for maintaining cardiac function [3, 10] and sleep disorders as a risk factor for heart disease, and between these diseases and diseases Sleep dysfunction has discovered effective communication [3, 10, 11]. On the other hand, ensuring adequate rest and falling asleep from the main responsibilities of nurses, therefore, nurses should be aware of the causes and causes of sleep disorders in patients. [2] Low sleep quality in the intensive care unit as a stressor causes can be release epinephrine and epinephrine [8, 10], which increases heart rate, respiratory rate, Blood pressure [2, 10], increased heart need for oxygen and a variety of disrythmia, which ultimately leads to exacerbation of ischemia and heart problems [4, 8, 10] Factors affecting the quality of sleep can include factors such as environmental factors (increased noise, light), non-environmental (hypnotics) and the nature of the disease (severity of pain, duration of hospitalization, etc.) [3, 4, 6, 8-10] Izadi and colleagues considered the most important modifying and influencing factors on the sleep of the patients admitted to the special department of the heart is light and environmental noise [6]. Zakeri Moghadam and et al was found that most patients admitted to the department Special attention is paid to the factors of the environment such as telephone noising, alarms of devices, talking to staff and patients about the factors affecting sleep disorder [3, 7, 10] in the ICT for facilitating the process. Nursing is required throughout the day to maintain light throughout the night, [10] which is one of the most important dysfunctional factors [9, 12], which disturbs the sleep rhythm and suppresses melatonin secretion and ultimately dysfunctional sleep Leads to. However, in special sections there is a wide range of light intensity (5 to 1400 lux), while 100 lux of light causes melatonin disruption at night, but there is a natural light that occurs throughout the day with the effect The retinal receptors of the eye result in sleep and waking [7, 10].

Other factors that lead to poor quality of sleep in special sectors are unwanted noise [7, 10, 13, 14], which affects the person from both physical and mental aspects [10], because the sound is as the most common environmental pollutant is now known [10, 15] and its most common and significant consequences are the cardiovascular aforementioned stimuli. In most studies, in high-level areas, sound levels (more than 80 dB) have been reported, while in hospital settings the level of sound inside the unit is less than 30 dB [7, 10, 13], 57-17% Sound is a sleep disorder. [7, 13]

With all the warnings and warnings on complications of sleep deprivation in hospitalized patients, especially in the cardiac care unit, many of the patients admitted to this section still experience problems with sleep disorder [12, 13]. Despite the many recommendations Using non-pharmacological methods to improve sleep also uses hypnotics to relieve the problem, but with regard to its costs and benefits, the quality of sleep can be improved by removing the causes of sleep disorder. Despite the many claims that use of methods to improve the conditions of the environment in the intensive care unit to improve the sleep of the patients, few studies have examined the effect of these measures. [10]

Due to the high prevalence of sleep disturbance in patients admitted to the cardiac care unit and the importance of proper sleep for these patients and its effect on the recovery process, [3] and considering that the most important factors affecting the sleep of these patients are light and [16] In the present study, we decided to investigate the effect of adjustment of environmental factors on the quality of sleep in the patients admitted to the Cardiac Care Unit of Shahid Modarres Hospital in Saveh [10].

## Materials and Methods

This is a clinical trial that evaluates the effect of environmental factors modification in cardiac patients hospitalized in CCU of Shahid Modarres Hospital in Saveh. In this study, 70 heart patients participated in the sampling, and the sampling method was that patients who had inclusion criteria were entered into the study with an unpredictable sampling and then randomly assigned into intervention and control groups they got. At the time of the study, all of them received informed consent, which before that provided comprehensive information on the research, the benefits, results and confidentiality of information and how to do the research. Demographic information as well as disease information were recorded as basic information on special forms.

At the beginning of the study, 3 days after hospitalization and after fixation of the condition, for both groups, intervention and control of the Peterbosbug standard sleep quality questionnaire were completed for the first time and as the baseline sleep data for both groups, then For the intervention group, a) light actions including: the separation of light from the nursing station from the light section with small and separate lights, reducing ambient light by turning off the unnecessary lights and, possibly, using the lightest bulbs at night, installing Thick curtains on the windows to control the light and sounds of the outside and the natural light of day in order to set the cycle of sleep and awakening and B) voice actions including: converting audio / video alarms during the night or reducing their voice, teaching personnel about reducing additional sounds, including reducing voices of cell phones, not using vowel shoes and reducing voice During the night's sleep, the patients were taken to a minimum during the night's sleep and the tone of the incoming and outgoing ringing tones was performed and three days after the continuous intervention of the above interventions (day 6), the sleep quality questionnaire was completed again.

For the control group, without any changes in the environmental conditions of the department, and in the same routine physical environment, the questionnaires were completed once at the beginning of the study (3 days after admission) and then 3 days later (the 6th day of admission).

The results were analyzed using descriptive tests (frequency, mean, standard deviation) and inferential statistics (repeated variance analysis).

**Questionnaires:**

- **Part I:** Demographic Information and Disease Information Questionnaire
- **Part II:** Pittsburgh Sleep Quality Index / PSQI Standard Quality Questionnaire:

The Standard Petersbug Sleep Quality Questionnaire has been translated into Iran and this questionnaire has been translated and validated in previous studies by Izadi Ondani and colleagues. The questionnaire has 9 questions in 7 sections: mental sleep quality, late sleep, sleep adequacy, sleep, sleep disturbances, sleep apnea and the use of hypnotic drugs and incomplete daily function. Each section has 0 to 3 points, and scores of 0, 1, 2, 3 on each scale indicate natural status, weak, moderate and severe. The maximum score of the questionnaire is 21 and the minimum score is zero. A score of less than 5 indicates a lack of difficulty and a score of more than 5 indicates a sleep disorder. In other words, the higher the score, the lower the sleep quality (1.10).

## Findings

The findings of the study showed that most of the patients were in control (85.8%) and intervention (89.8%) in the control group were male. The majority of patients were control group (60) and intervention (79.9) were Unemployed. The mean age of the patients in the control group was 44.7 ± 14.9 and in the intervention group was 42.6 ± 12.2. The mean weight of the patients in the control group was 56.8 ± 10.66 and in the intervention group was 65.1 ± 10.3. The two groups did not have a significant difference in terms of distribution of variables such as gender, occupation, age and weight.

The mean sleep quality score in the intervention group before the intervention (44.8 ± 14.51) and after the intervention (59.3 ± 17.10) were statistically significant. In the control group, the mean sleep quality score before intervention (49.1 ± 13.73) and after intervention (49.05 ± 11.99), this difference was not statistically significant. There was no significant difference in the difference in mean of sleep quality between the two groups before and after the intervention (P = 0.6). However, there was a significant difference between the general score of sleep in the intervention group and post-intervention control group there was. (p=0. 2)(p=0.001).

**Table 1: Frequency distribution of cardiac patients based on demographic characteristics in intervention and control groups**

| Indicator | Group | Indicator level | Frequency (People) | Frequency precent | p |
|---|---|---|---|---|---|
| gender | control | male | 29 | 85/8 | 0/51 |
| | | female | 6 | 14/2 | |
| | intervention | male | 31 | 89/8 | |
| | | female | 4 | 10/2 | |
| Job | Control | Free | 2 | 4/4 | 0/11 |
| | | Employee | 9 | 24/4 | |
| | | Retired | 5 | 11/2 | |
| | | Unemployed | 19 | 60 | |
| | Intervention | Free | 3 | 6/7 | |
| | | Employee | 5 | 11/2 | |
| | | Retired | 1 | 2/2 | |
| | | Unemployed | 26 | 79/9 | |
| | | control | Standard deviation ± average | 57/3 ±10/7 | |
| Weight (kg) | control | Standard deviation ± average | 56/8±10/6 | | 0.42 |
| | intervention | Standard deviation ± average | 65/1 ±10/3 | | |
| Age (year) | control | Standard deviation ± average | 44/7±14/9 | | 0.11 |
| | intervention | | 42/6±12/2 | | |

**Table 2: Mean score of sleep quality in intervention and control groups before and after intervention**

| variable | Group | Befor of intervention Standard deviation ± average | P | After of intervention Standard deviation ± average | P | P |
|---|---|---|---|---|---|---|
| Quality of sleep | intervention | 44/8±14/51 | 0/6 | 59/3 ±17/10 | 0/001 | 0/001 |
| | control | 49/1±13/73 | 0/6 | 49/05±11/99 | 0/56 | 0/2 |

## Discussion

The results of this study showed that the mean sleep quality score before intervention was 44.8 ± 14.51 and 59.5 ± 17.10 after intervention (P = 0.001). It has been shown in numerous studies that after seeking patients in specialized care units, patients' sleep quality is reduced, and several of them are listed below. The results of Weiss et al. Study in patients with cancer admitted to intensive care units [12].

In the study of Zolfaghari et al., The results were in line with the present study and the findings showed that by reducing the confounding factors of sleep, it is possible to reduce the quality of sleep in patients admitted to the coronary care unit. In this study, the mean sleep quality score before and after intervention was 93.1 ± 5 and 26.2 ± 11.11, respectively, which indicates a growing trend in sleep quality in patients with coronary artery after adjustment of confounding factors. Although in the above study, as in our study, environmental factors have been moderated, the time for the intervention to moderate environmental factors is different in the two studies.

Also, the results of the study of Nashvandi et al. were also consistent with the results of the previous study. The findings showed that nursing measures, which are part of providing a suitable physical environment for patients, have a positive effect on the quality of sleep in patients with heart disease. It's great. The difference between studying with the study is that in the study of Nashi and colleagues, the hours of nursing practices (such as being present), and even factors such as humidity and temperature, which can affect the sleep cycle and awakening, are also subject to moderation [3].

The results of the study by Eliasianfar et al. Also showed that using non-invasive and non-pharmacological methods such as blindfolds and claws could improve the quality of sleep in patients with cardiac carcinoma [17]. Although there is a difference in the study method in our study, however, in both studies, in some cases, some disruptive environmental factors have been eliminated as far as possible.

Today, patients' sleep quality is recognized as an important part of patient care, and national and international health and safety organizations are seen as a goal [18]. Despite the many recommendations for the use of non-pharmacological methods and even the use of pharmacological methods to improve sleep, the prevalence of sleep disorders is also significant (63.6%) in patients admitted to specialized care units, and this can be Affects all aspects of the lives of patients and creates a faulty cycle. In addition, due to the significant role of sleep in the recovery process and in the absence of such complications as increased hospitalization time, long-term complications, including hospital infections, increased therapeutic costs and the imposition of financial burden, will follow. Since numerous studies have proven that environmental degrading factors play a major role in reducing sleep quality, in this study, improving the sleep quality of patients admitted to the intensive care unit was shown by modifying the confounding environmental factors.

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