Introduction

Cardiovascular diseases (CVD) are first among the causes of morbidity, mortality and medical costs worldwide. Unhealthy eating habits such as tobacco use, excessive alcohol consumption, physical inactivity and excessive salt consumption are common risk factors in the development of cardiac diseases [1]. In addition to these risk factors, recent studies show that sleep problems are also effective in the development of CVD. Less than 6 hours of sleep increases the risk of CVD. In addition to various studies showing the effect of short sleep time, the effect of long-term sleep on the cardiovascular system has been investigated in recent years. Current evidence suggests that disturbances in sleep patterns, such as short or long sleep duration, contribute to the development of CVD [2]. One study found that people who slept less than 7 hours per night had a 12% to 35% higher risk of death than those who slept more than 7 hours [3].

Sleep is considered as one of the basic physiological needs of human beings, which covers 1/3 of human life and ensures health continuity [4-6]. A deterioration in health status can manifest itself with sleep disorders, as well as a deterioration in sleep patterns can have a direct impact on general health and life activities [6].

Sleep problems are a cause of stress for the body. Although stress is protective in the short term, constant...
stirmentation causes pathological consequences in the long term. Chronic sleep deprivation provides over-stimulation of the sympathetic nervous system and Hypothalamus-Pituitary-Adrenal (HPA) axis. With sympathetic nervous system activation, an increase in the release of adrenaline, noradrenaline and vasopressin, resulting in an increase in heart rate and blood pressure [7]. After activation of the hypothalamus, epinephrine and norepinephrine are released from the adrenal medulla.

Within the cardiovascular system, the increase in circulating catecholamines can result in hypertension, tachycardia and sometimes dysrhythmias [1]. While insomnia has been proven to alter biological phenotypes of deoxyribonucleic acid (DNA), ribonucleic acid (RNA), and protein levels, the underlying mechanisms have not been clearly demonstrated [8].

Sleep deprivation which emerging conditions contribute to the development of cardiovascular diseases such as vascular calcification, hypertension, atherosclerosis, arrhythmia, and myocardial infarction [7,8].

Surgical interventions are widely used in health promotion and treatment of diseases. Surgery is a sudden event that affects people's physical and psychological well-being as well as their personalities, roles and family relationships [6].

As a challenge for patients, the surgical procedure brings pre-and postsurgical limitations, which can generate significant levels of anxiety [9]. Nurses have great responsibilities in order to maximize the well-being of patients prepared for surgical intervention, to have a successful operation and to ensure patient satisfaction. Improving sleep quality in the preoperative period and reducing the anxiety levels of patients before surgery is an undeniable important part of the holistic nursing approach [10].

Material and methods

Sample

The population of this descriptive study (n=120) consisted of patients who were hospitalised in the cardiovascular surgery clinic between November 2016 and May 2017. The study was planned to observe the effects of pre-operative sleep and distress intolerance levels on post-operative cardiovascular surgery patients.

Inclusion criteria

• Patients who were diagnosed with cardiovascular diseases
  • Aged 18 years or older
  • Not having communication problems
  • Patients who stayed at least 24 hours in ICU

Exclusion criteria

• Patients undergoing different surgery
• Patients taking sedatives, hypnotics, antidepressants and amphetamines
• Patients in shift work

Data collection

"Personal Information Form", Distress Intolerance Index (DII), Pittsburgh Sleep Quality Index (PSQI) and the Insomnia Severity Index (ISI) were used to collect data.

A questionnaire consisting of 4 sections was used to collect the research data.

The first section included "Personal Information Form" consisting of 11 questions related to patients' descriptive characteristics and their pre-operative and post-operative vital signs.
Table 1: Distribution of Individual Characteristics of Patients (n=120)

| Characters         | Frekans (n) | Percentage (%) | Mean ± SD |
|--------------------|-------------|----------------|-----------|
| Gender             | Male 82     | 63.3           | 63.2±12.1 | 0.369     |
|                    | Female 38   | 31.7           | 65.2±9.2  |           |
| BMI                | Male 82     | 63.3           | 27.6±4.6  | 0.341     |
|                    | Female 38   | 31.7           | 27.2±4.5  |           |
| Marital status     | Married 81  | 67.5           |           |           |
|                    | Single 39   | 32.5           |           |           |
|                    | Total 120   | 100.0          |           |           |
| Cigarette smoking  | No 53       | 44.2           |           |           |
|                    | Yes 67      | 55.8           |           |           |
|                    | Total 120   | 100.0          |           |           |
| Alcohol use        | No 96       | 80.0           |           |           |
|                    | Yes 24      | 20.0           |           |           |
|                    | Total 120   | 100.0          |           |           |
| Previous Surgical Experience | Yes 79 | 65.8 | | |
|                    | No 41       | 34.2           |           |           |
|                    | Total 120   | 100.0          |           |           |

Table 2: Distribution of Patients According to Variation of Extubation (hours), Mobilization (hours) and Duration of Intensive Care Unit (hours)

| n       | Min-Max | Mean ± SD   |
|---------|---------|-------------|
| Extubation Duration | 120     | 4-27 | 9.12±3.51 |
| Mobilization Duration | 120    | 8-33 | 17.08±0.35 |
| ICU Length of Stay    | 120     | 21-64 | 51.98±0.57 |

The data is presented as: n, number; min-max, mean and standard deviation (SD).

Table 3: Total Score of Distress Intolerance Index and Pittsburgh Sleep Quality Index

| N       | Distress Intolerance Index Total Score | Mean ± SD   |
|---------|--------------------------------------|-------------|
| 120     | Pittsburgh Sleep Quality Index        | 120         |
|         | n Min-Max                             | 2.00-16.00  | 7.17±3.70 |
|         | Mean ± SD                             | 33.06±9.19  |

Table 4: The Relationship Between Total Score of Distress Intolerance Index and Pittsburgh Sleep Quality Index Total Score

| Distress Intolerance Index Total Score | Pearson Correlation | Sig. (2-tailed) | N |
|--------------------------------------|---------------------|-----------------|---|
| Pittsburgh Sleep Quality Index       | 0.467**             | 0               | 120 |

Data are presented as number, percent, mean±standard deviation (SD) and range.

Discussion

We found a positive correlation between impaired sleep quality and distressing intolerance. Heart failure (HF) is seen that common worldwide [17]. It has been proven that sleep problems also increase morbidity and mortality. When the pain level and sleep problems of the patients undergoing open heart surgery are not controlled, the patient's comfort deteriorates, complications can develop more easily, and the recovery period and hospital stay may be prolonged [18]. Although surgical interventions are important for each patient group, the psychological effects of the surgery can be more intense when it comes to open heart surgery [19]. When the pain level and sleep problems of the patients undergoing open heart surgery are not controlled, the comfort of the patient deteriorates, complications can develop more easily, healing process and length of hospital stay may be prolonged. Inadequate information on the subject in the literature was the basis of this research. In this study, we aimed to determine the effect of preoperative sleep and intolerance to distress on postoperative patients in cardiovascular surgery patients. In Ibrahimoglu’s study, the mean of age revealed a sample 60 or close to 60 years. In experimental group 60% and in control group 66.7% were smokers [20]. When the mean age of studies is examined, it is seen that the results show similar characteristics with this study.

Although 100% of the patients had been mechanically ventilated, patients had extubated after 9.12±3.51 hours the transfer from the operation to the ICU. Patients mobilized 17.08±0.351 hours after transfer to the ICU. The duration of ICU stay was 51.98±0.574 hours in this study. Postoperative complications also affect the duration of hospital stay and functional recovery. In this study show that the mean of PSQI the patients was 7.17±3.70. As the PSQI score of the patients increased, sleep quality deteriorated, the total score of the tolerance to DII increased, tolerance decreased.

Sleep helps maintain a healthy balance of endocrine and immune systems [21]. In those who have sleep deprivation, this balance may not be maintained. Sauvet [22] demonstrated in a study of rats that 24-hour wakefulness caused a decrease in endothelial-dependent vasodilation not associated with changes in blood pressure or sympathetic activation [8]. Intubation and extubation can increase the concentration of catecholamines in the blood by stimulating the sympathetic nervous system.
and cause severe hemodynamic changes [20]. Tobaldini et al. demonstrated that arterial blood pressure (ABP) changes significantly after a 24-hour sleep loss [7]. In our study, it was determined that those with low sleep quality had a high tolerance to distress and as PSQI increased, the duration of stay in the ICU increased and sleep quality decreased. We believe it is important to maintain a pre-operative sleep pattern in patients undergoing cardiovascular surgery, and our current findings may be a trigger for future research into sleep deprivation.

**Conclusion**

Although surgical interventions are important for each patient group, the psychological effects of the surgery may be more intense when it comes to open heart surgery. Open heart surgery is a clinical process that affects the functions of all organs and systems in the body. Patients’ existing sleep quality disorder and intolerance to distress are already deteriorated by the already poor quality of life sleep problems. Therefore, we think that close clinical follow-up of patients with poor sleep quality will decrease morbidity and mortality with applications that will improve sleep quality positively (medical treatment, psychosocial support, optimal environment).

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