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Effect of Breathing Exercise on Sleep and Anxiety Levels of Patients Hospitalized in Surgical Clinics [*]

Objective: The aim of this research is to determine the effect of patients' breathing exercises on their sleep and anxiety level.

Materials and Methods: This research was conducted in descriptive type. The subjects of the research consisted of all adult patients who underwent surgery in the University Hospital General Surgery Clinics, and the research sample was determined as 200 patients. The data was collected using a personal data form, The Richards-Campbell Sleep Questionnaire (RCSQ), and The State-Trait Anxiety Inventory (STAI) through a face-to-face interview.

Results: The mean age of the patients was 48.26±18.92. Also, 93.5% stated that they received breathing exercise training from the nurses, and 63% informed that the person who taught breathing exercise training both practiced the exercise and made the patients practice it. It was found that there was a significant difference between the overall score from RCSQ and the variable of teaching the breathing exercise. When taking into account the mean ranks of RCSQ (p=0.001) and state anxiety scale (p=0.001), the difference is in favor of the group taught preoperative breathing exercise.

Conclusions: It was found that the sleep quality of the patients who were taught breathing exercises increased and their state anxiety decreased. The effective exercise of breathing may be recommended to improve the effectiveness of treatment of patients.

Key Words: Breathing exercise, sleep, anxiety, nursing

Cerrahi Kliniklerde Yatan Hastaların Solunum Egzersizi Yapma Durumlarının Uyku ve Kaygı Düzeyine Etkisi

Amaç: Bu araştırmanın amacı, hastaların solunum egzersizlerinin uyku ve kaygı düzeylerine etkisini belirlemektir.

Gereç ve Yöntem: Bu araştırma tanımlayıcı tipte yapılmıştır. Araştırmanın evreni Üniversite Hastanesi Genel Cerrahi Kliniklerinde ameliyat olan tüm yetişkin hastalardan oluşmaktadır, araştırma örneklemi 200 hasta olarak belirlenmiştir. Veriler, Kişisel Bilgi Formu, Richards-Campbell Uyku Ölçeği (RCSQ) ve Durumluk Sürekli Kaygı Envanteri (STAI) kullanılarak yüz yüze görüşme yoluyla toplanmıştır.

Bulgular: Hastaların yaş ortalaması 48.26±18.92'dir. Ayrıca %93.5'i hemşirelerden solunum egzersizi eğitimi aldığını, %63'ü solunum egzersizi eğitimi veren kişinin hem egzersizi uyguladığını hem de hastalara yaptırdığını belirtmiştir. Solunum egzersizini öğretme değişkeni ile RCSQ toplam puanı arasında anlamlı bir fark olduğu bulunmuştur. RCSQ (p=0.001) ve durumluk kaygı ölçeği (p=0.001) sıra ortalamaları dikkate alındığında, fark ameliyat öncesi solunum egzersizi yapılan grup lehinedir.

Sonuç: Solunum egzersizleri öğretilen hastaların uyku kalitelerinin arttığı ve durumluk kaygılarının azaldığı bulundu. Hastaların tedavisinin etkinliğini artırmak için etkili solunum egzersizi önerilebilir.

Anahtar Kelimeler: Solunum egzersizi, uyku, kaygı, hemşirelik

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Introduction

Although the success of surgery in terms of patients is thought to depend on advanced surgical techniques, knowledge, and skills, it is also known to depend on preoperative preparation and postoperative care (1). Post-operative breathing complications are frequently seen. Impaired breathing muscle integrity due to incision of chest wall and abdomen, pain in the incision site, phrenic nerve dysfunction, associated diaphragm dysfunction, and other systemic effects reduce the depth of breathing. Decreased breathing depth causes complications such as hypoxemia, atelectasis, and infection. In preventing these complications, it is important for patient care to teach breathing exercises to the patients and make them apply them before surgery, and continue these exercises after surgery (2, 3). The goals of nursing care consist of accelerating patient recovery by performing breathing exercises that will oxygenate the blood, and increase lung volume (1, 2). Breathing exercises increase the amount of oxygen in the cells, improve gas exchange, stimulate surfactant production and reduce the development of complications (3, 4). In addition, it increases the patient's adaptation to treatment and reduces the length of hospital stay and the use of painkillers, so the

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patient returns to his normal life in a shorter time (1, 5). A nurse performs this process by using the role of educator in addition to the role of caregiver. Breathing exercises are just one of the nursing practices that improve the patient's quality of life. In this context, having knowledge and practicing it improves the quality of nursing care (6, 7).

Sleep is a physiological process that affects many systems of the body. Sleep consists of the REM (Rapid Eye Movements) phase, where mental rest occurs, and the NREM (nonREM) phase, where physical rest occurs (8). Sleep increases the body's resistance to infections by affecting various immune parameters, accelerating healing. Sleep is therefore an important factor in wound healing, especially in surgical patients (9). In addition to improving breathing, exercises improve the quality of sleep by relaxing the patient, reducing anxiety, and increasing the speed of recovery (4, 8, 10).

Surgical intervention is a cause of great anxiety for a patient, while the hospital environment, being away from his/her family, fear of obscurity, the treatment process, and less providing of physiological requirements cause anxiety (10). A high level of anxiety experienced before surgery increases physiological signs such as breathing rate, heart rate, and blood pressure and leads to an increased need for painkillers and analgesics after surgery (11, 12). Quality nursing care should be planned from a holistic point of view and should be individual-specific based on realistic goals. Data collection, objective interpretation of data, planning, and implementation constitute important stages of patient care (13).

Our aim in the study is to investigate the influence of breathing exercises on the anxiety levels and sleep of patients.

Materials and Methods

Research and Publication Ethics: Necessary permission to conduct the research was obtained from the Fırat University non-interventional research ethics committee (2021/02 -27). At all stages of the research, the articles of the Helsinki declaration were taken into account. Informed written consent was obtained from each study participant. They were also informed of their full right to refuse, withdraw, or completely reject their part in the study. Confidentiality was guaranteed by keeping the secret of personal identification and keeping questionnaires and results in a well-secured area.

Research Design and Sampling: This descriptive research was carried out between February 2021 and May 2021 at the Fırat University Hospital General Surgery Clinics. All adult patients who underwent surgery in the hospital's surgical clinics formed the population of the research. All patients were included, regardless of the type of surgery. In general surgery clinics, approximately 375 operations are performed in a year. By power analysis with 0.08 effect size, 0.05 error level, and 0.95 ability to represent the population, the sampling amount of the study was assigned as 200. The

data were collected by the researchers by face-to-face interview technique on the 2nd postoperative day from patients who were hospitalized in general surgery wards for at least 72 hours. The data were selected by random sampling. Based on the inclusion criteria patients were selected and were randomly allocated into two groups; Preoperative the status of learning the breathing exercises, postoperative the status of learning the breathing exercises.

Breathing exercise: 'Sit on the edge of the bed or lie on your back and bend your knees to relax your abdominal muscles. Place your hands on the sides of your abdomen. Continue breathing through your nose until your upper abdomen bulges outward. Slowly blow air through your mouth, contracting your abdominal muscles.' It is a routine practice taught in the form of

Data Collection: A Personal Data Form, The State-Trait Anxiety Inventory (STAI), and The Richards-Campbell Sleep Questionnaire (RCSQ) were used to collect data.

Personal Data Form: It was developed to collect introductory information about patients who volunteered to take part in this research. It includes information about age, gender, profession, marital status, level of education, the state of learning the breathing exercises, who teaches breathing exercises, and how breathing exercises are taught.

The Richards-Campbell Sleep Questionnaire (RCSQ): The scale, originally called the Richard-Campbell Sleep Questionnaire (RCSQ), was revealed in 1987by Richards. RCSQ refers to a 6-item scale that assesses the time to fall asleep, the depth of night sleep, the time to stay awake when you wake up, the frequency of waking up, the level of noise in the environment, and the quality of sleep. Using the visual analog scale technique, each item is scored from 0 to 100 on a chart. A score of "0-25" on the scale indicates very poor sleep, while a score of "76-100" suggests excellent sleep. The scale's total score is calculated using 5 items; the sixth item, which assesses the noise level in the surroundings, is removed from the total score calculation. Patients' sleep quality improves as their scores on the scale rise. The scale created by Richards was found to have a Cronbach's alpha value of 0.82 (14). But, Cronbach's alpha was found 0.94 in the present study. Its reliability and validity investigation was carried out by Karaman Özlü and Özer (15).

The State-Trait Anxiety Inventory (STAI): The Turkish reliability and validity of the scale created by Spielberger et al (16) were made by Öner and Le Compte (17). This scale consists of 40 items, the first twenty questions measure the patient's level of state anxiety, and the other twenty questions measure the level of trait anxiety. Reliability values were observed to range from 0.83 to 0.87 for trait anxiety and from 0.83 to 0.92 for state anxiety in the Turkish-adapted scale. Cronbach's alpha value of this study was found to be 0.79 for state anxiety and 0.89 for trait anxiety. Eighty and above points taken from the scale are evaluated as panic, 60-79 points as severe anxiety, 40-59 points as

moderate anxiety, 20-39 points as mild anxiety, and 0-9 points as no anxiety (16, 17).

Statistical Analysis: The Statistical Package for Social Science 22.00 (SPSS) program was used to analyze the study's data. When reviewing study data, the normality test was performed using the Shapiro-Wilk test in addition to descriptive statistical methods (percentage, number, standard deviation, average). In comparisons between the two independent groups, the Mann-Whitney U test was employed since the normal distribution was not observed in the collected data. The significance level was accepted as $p<0.05$.

Results

The participants in the study were 48.26±18.92 on average. Also, 53% (n=106) of the subjects of the research group were women and 75.5% (n=151) were married; 69.5% (n=139) of the participants received breathing exercise training before surgery and 30.5%

(n=61) after surgery. Again, 93.5% stated that they received breathing exercise training from nurses, and 63% said that the person who taught breathing exercise training both practiced the exercise and made the patients practice it (Table 1).

According to Mann-Whitney U-test outcomes, there is a significant difference between the overall score obtained from the RCSQ and the variable of teaching the breathing exercises. When RCSQ (p=0.001) and state anxiety scale (p=0.001) are taken into account, the difference is in favor of the group taught breathing exercises before surgery. This also coincides with the high positive attitude outcomes of preoperative breathing exercise training for sleep and anxiety in general terms.

There were no statistically significant differences between the patients' preoperative and postoperative breathing exercise training and their trait anxiety levels (p=0.672) (Table 2).

Table 1. Socio-Demographic Characteristics of the Patients Involved in the Study

Average age		48.26±18.92
Socio-Demographic Characteristics	**n**	**%**
Gender		
Woman	106	53.0
Man	94	47.0
Marital Status		
Married	151	75.5
Single	49	24.5
Education Status		
Illiterate	31	15.5
Elementary school graduate	49	24.5
Middle school graduate	32	16.0
High school graduate	49	24.5
University graduate and above	39	19.5
Breathing Exercise Learning Status		
Preoperative	139	69.5
Postoperative	61	30.5
Who Taught the Breathing Exercise?		
Nurse	187	93.5
Doctor	4	2.0
Nurse+Doctor	9	4.5
How breathing exercises were taught?		
The person who taught told me.	24	12.0
The person who taught told me and practiced it.	50	25.0
The person who taught it practiced it, and he/she made me practice it.	126	63.0

Table 2. Distribution of Total Scores of RCSQ, State Anxiety and Trait Anxiety Scales of Patients Taught Breathing Exercise (n=200)

	The status of learning the breathing exercises	n	RA	TR	U	p
RCSQ	Preoperative	139	110.19	15316.00	2893.000	**0.001**
	Postoperative	61	78.43	4784.00		
State anxiety	Preoperative	139	127.12	17670.50	539.000	**0.001**
	Postoperative	61	39.84	2430.50		
Trait anxiety	Preoperative	139	99.35	13810.00	4040.000	0.672
	Postoperative	61	103.11	6290.00		

RCSQ: Richards-Campbell Sleep Scale, RA: Rank average, TR: Total Rank, U: Mann Whitney U Test

Discussion

In order for patients to get clinical benefits in the postoperative period, one of the interventions that can be performed during the pre-operative period is breathing exercises (18). Ghorbani et al. (19) conducted a study on patients who underwent coronary artery bypass graft, it was determined that deep breathing exercises enhance the duration and quality of postoperative sleep. A study conducted on patients with lung transplantation found a positive correlation between the regulation of patients' breathing and sleep efficiency (20). It was also determined in another study that breathing exercise training in patients improved sleep quality (21). Breath training led by a supportive-trainer nurse was found to reduce anxiety and sleep disturbance in patients who underwent graft coronary artery bypass (22). Methodological studies that tested many training strategies and interventions, such as breath training, showed significant improvement in sleep evaluations of patients after cardiac surgery (23).

In our study, patients who performed breathing exercises had high sleep quality (RCSQ score between 76-100 indicates very good sleep) and there was a significant difference between both variables. Our results are similar to the literature.

As a result of the work of Spielberger et al, the concepts of "state anxiety" and "trait anxiety" were identified for the first time, and the distinction between anxieties was made. According to this, state anxiety is a subjective fear that a person feels due to a distressed state, problems, or pressure that they experience at that moment, and trait anxiety is the individual's perception of living conditions as stressful mostly and a tendency toward anxiety (16, 17).

According to our research findings, patients who performed breathing exercises had low state anxiety scores, and the difference between these variables is significant statistically. But there were no significant differences between breathing exercise-making status and trait anxiety levels. The reason for this may be that breathing exercise reduces the troubles momentarily, so people relax more.

Deep breath exercise therapy is effective in alleviating postoperative pain and anxiety levels in orthopedics patients (24). A study that examined the effect of breathing exercises on anxiety levels showed a decrease in anxiety levels (25). A study conducted on patients undergoing heart surgery found that state anxiety decreased in patients who performed breathing exercises following preoperative training (26). A study conducted on patients with mastectomy surgery found that breathing exercise causes a decrease in patients' anxiety (27).

As a result, in our study it was found that breathing exercises increased patients' sleep quality and decreased trait anxiety. By doing this exercise effectively, the effectiveness of treatment of patients may increase, and postoperative complications can be prevented. It is recommended to set standards for breathing exercises and make them part of nursing practices and care in a systematic and planned way.

Limitation of the study, the results of the study can only be generalized to this group.

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