The effect of lavender oil on anxiety levels of patients before laparoscopic cholecystectomy

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1. Introduction

Cholecystectomy is the removal of gallstones using surgical methods. Gallstones are the most common gallbladder disease, and is seen in four out of every 100 people. Cholecystectomy surgeries constitute a significant part of surgical interventions in hospitals, and are performed in two forms, laparoscopic and open surgery. Laparoscopic cholecystectomy surgery is preferred to open cholecystectomy surgery because it poses lower risk of complications and reduces length of hospitalization [1,2]. Surgical interventions can cause patients to encounter physical and psychological problems. Surgical interventions may cause patients to feel emotional stress such as role loss, job loss, and burden to other family members. This can lead to pre-operative anxiety in patients. High pre-operative anxiety level in patients causes them to feel intense post-operative pain [3,4]. It may also increase the risk of developing physical and psychological complications in patients. Therefore, it is of utmost importance to reduce patients' anxiety levels before surgical intervention.

Today, various methods are used to reduce pre-operative anxiety level in patients. Complementary and alternative treatment methods have an important place among these methods [5,6]. The demand for and interest in complementary treatment has significantly increased because of the cost of medical treatment methods used in diseases, the increase in chronic and malignant diseases that are difficult to treat, the difficulties faced by people in reaching medical treatment possibilities, and the side effects of currently applied medical treatments [7]. The rate of using complementary treatment modalities ranges between 9% and 65% across the world [8]. Studies show that there are many applications in which complementary treatment methods are used. Some of them are acupuncture, massage, shiatsu, yoga, hypnosis and aromatherapy [9].

The aromatherapy method, which involves the use of essential oils obtained from flowers, plants and trees to improve health and wellness, has become increasingly widespread nowadays [10]. Thanks to the increase in scientific research on aromatherapy, it has become clear that various plant oils are effective on many diseases [11,12]. Aromatherapy was determined to reduce depression [13]. Another study

report that aromatherapy affects heart rate positively [14]. Lavender oil is one of the substances used in aromatherapy which are effective on many emotional and physiological problems especially in reducing anxiety. This oil, which is obtained from lavender plant using water vapor distillation method, contains 30–40% of linalool and 35–55% of linyl acetate. In addition, this oil includes terpenic substances such as geraniol, eucalyptol and borneol, as well as tannins and caffeic acid [15,16]. Although it is known that lavender oil has effects on infections, stomach disorders and kidney problems, especially its anxiety-reducing effect has been the subject of many studies. Toda & Morimoto (2008) have found that lavender is effective on people's psychological and physiological conditions and reduces stress [17]. Shaw et al. (2007) conducted a study of mice, and have found that lavender oil has an anxiolytic effect [18].

Along with the increase of interest in complementary and alternative treatment methods, these methods have started to be implemented by those without profession in health field. As a result, it has become inevitable for nurses, who have an important role in health care, to have knowledge of complementary treatment methods and apply them when necessary [19,20]. The developments occurring across the whole world has caused some changes in nursing just as in every other profession, and thus nurses also started to have knowledge about alternative treatment applications. In this context, it is expected that the study results will make significant contribution to the literature and increase awareness of nurses, who have a key role in the health field, regarding aromatherapy.

This study aims to determine the effects of lavender oil on anxiety level of patients before laparoscopic cholecystectomy. In this respect, the following questions were sought within the scope of this study:

1. What is the pre-operative anxiety level of patients who will undergo laparoscopic cholecystectomy?
2. Does lavender oil have any effect on pre-operative anxiety level of patients who will undergo laparoscopic cholecystectomy?

In this respect, the study hypothesis is set as follows:

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H1. Lavender oil reduces anxiety level of patients before laparoscopic cholecystectomy.

2. Materials and methods

2.1. Study type

This study was conducted as a quasi-experimental model with pre-test, post-test control group.

2.2. Study place

The study was carried out in the general surgery clinic of a state hospital located in the west of Turkey.

2.3. Study population and sample

The study population consisted of all patients hospitalized for laparoscopic cholecystectomy surgery in the general surgery clinic of a state hospital located in the west of Turkey. The study sample was determined to be 110 patients (55 patients in control group, 55 patients in experimental group) as a result of the power analysis with 0.05 error margin, 0.07 effect size and 95% of power representation for the universe. The control and experimental groups were selected using simple random sampling method. Criteria for inclusion in the study are; being volunteer to participate in the study, being 18 years old and over, having conscious for implementing questionnaires, being communicable (e.g. having no hearing, visual, smell and perception problems), being an elective (planned) surgical case (being hospitalized at least 2 h before the surgery), having no respiratory system disease, having no allergic diagnosis and history, and having no mental illness.

2.4. Data collection tools

The data were collected using the Descriptive Characteristics Form and the State Anxiety Inventory.

2.5. Descriptive characteristics form

The descriptive characteristics form, which was prepared by the researcher through literature review, consisted of 18 questions regarding patients' age, gender, weight, height, body mass index, education level, employment status, marital status, number of living children if any, occupation, place of residence, income status, social security, chronic illness status, hospital history, surgical history, and knowledge on aromatherapy and lavender oil.

2.6. State anxiety inventory

Turkish reliability and validity study of the inventory which was developed by Spielberger et al. (1970) was conducted by Öner and Le Compte (1977). The scale consists of a total of 40 questions 20 of which determines the trait anxiety levels and 20 of which determines the state anxiety levels. The state anxiety inventory, which is a 4-point likert scale, determines how individual feels at a certain moment and under certain circumstances. In the inventory, negative feelings are expressed via direct statements; whereas, positive feelings are expressed via reversed statements. Cronbach's alpha coefficient of state anxiety inventory was determined as 0.91. The scores on the scale range from 20 to 80. While high scores obtained from the inventory signify high anxiety level, low scores signify low anxiety levels. In this study, Cronbach's alpha coefficient of the state anxiety inventory was determined as 0.87.

2.7. Data collection process

The data were collected by the researcher in the patient rooms of the general surgery clinic of a state hospital, using face-to-face interview method and data collection forms. The participant patients were informed about the study subject, purpose, data collection methods, and lavender oil application method, and then their questions were answered in this regard. The data were collected 2 h before surgery. Each patient interview lasted approximately 20 min.

2.8. Nursing intervention

A lavender oil approved by Republic of Turkey Ministry of Food, Agriculture and Livestock was used as intervention material during the nursing intervention. Studies report that lavender oil becomes effective in 10–15 min after inhalation. Oral presentation, and question-and-answer techniques were used during the informing phase of the application. The steps taken for nursing interventions used in the study were set as follows:

For the experimental group, the descriptive characteristics form and the state anxiety scale were applied, and then lavender oil application was performed through respiration. Lavender oil was applied through inhalation of 5 drops for at least 5 min (on average: 5–10 min), using 5*5 cm sterile sponge. Twenty minutes after the lavender oil inhalation was over, the state anxiety scale was reapplied.

For the control group, the descriptive characteristics form and the state anxiety scale were applied, but lavender oil application was not performed through respiration, only routine clinical procedures were applied. The state anxiety scale was reapplied at least 20 min (on average: 20–25 min) after the first application of the scale. The independent variable of the study: Lavender oil application. The dependent variable of the study: Anxiety level of patients.

2.9. Data evaluation

In the evaluation of the data, the numbers and percentages from socio-demographic data of the patients were calculated at first, and then the significance between the groups was measured using the Chi-square test. Then, the pre-test and post-test scores of the experimental and control groups were compared separately using the paired sample t-test. The difference between the patients' trait anxiety, state anxiety pre-test scores and state anxiety post-test scores was calculated using the independent-samples t-test.

2.10. Ethical considerations

A written permission from İzmir Menemen State Hospital Directorate and an approval from the Ethics Committee of the same hospital were obtained before starting to the study. Subsequently, an expert approval letter including expert opinion on the use of lavender oil was obtained from a pharmacist with expertise in aromatherapy. The healthcare professionals who were in charge of the hospital's general surgery clinic were informed about the study purpose, data collection methods and application. The patients who volunteered to participate in the study were informed about the study, and their relevant questions were answered. It has been noted that the selected patients were willing and able to answer the questions diligently, and free to leave at any time. Since the use of human beings in studies requires the protection of personal rights, a written informed volunteer consent was received from each participant.

3. Results

The mean age of the participants was 42.69 ± 10.68 years in the experimental group (n = 55) and 41.90 ± 10.89 years in the control group (n = 55). In addition, 54.5% (n = 30) of the experimental group