Research Article
Volume 5:5, 2021

Journal of
Clinical Anesthesiology

Open Access

Aromatherapies can Reduce Incidence of Anxiety in Ambulatory Surgery Patients: A Pilot Study

Kushee-Nidhi Kumar[1]*, Ambreen Alam[1], Anna Ng Pellegrino[2], Vikas Yellapu[3]

[1]Department of Research and Innovation, St. Luke's University Health Network-Bethlehem Campus, Bethlehem, PA, United States
[2]Department of Anesthesiology, St. Luke's University Health Network-Bethlehem Campus, Bethlehem, PA, United States
[3]Department of Internal Medicine, St. Luke's University Health Network-Bethlehem Campus, Bethlehem, PA, United States

Abstract

Purpose: The aim of the study is to evaluate the effectiveness of lavender aromatherapy on patients undergoing outpatient surgery to reduce anxiety scores, improve patient's vital signs, and reduce the use of anti-anxiety medications.

Methods: Vital signs and anxiety scores were documented before and after 30 minutes of lavender aromatherapy in perioperative area. Patients' interest in anti-anxiety medication before surgery, and patient experience with the aromatherapy was also assessed.

Findings: 75% of patients reported a decrease in their anxiety score number and 57% reported a decrease in anxiety range 30 minutes after the start of aromatherapy. 39% of patients saw a reduction in the Mean Arterial Pressure (MAP) by 10 units or more and 31% saw a reduction in heart rate by 10 units or more after aromatherapy use (p value<0.05). 22% of patients did not require an anxiolytic medication prior to entering the OR (Operating Room). 55% of patients returned surveys back with mainly positive feedback about the project.

Conclusion: Lavender aromatherapy proves to be an effective method in reducing anxiety scores, improving patient's vital signs, and reducing use of anti-anxiety medications among patients undergoing outpatient surgery..

Keywords: Elequil aromatab • Lavender • Acute • Aromatherapy

Abbreviations: ASC: Ambulatory Surgery Center • MAP: Mean Arterial Pressure • HR: Heart Rate • RR: Respirational Rate • PAUC: Post-Anesthetic Care Unit

Introduction

Acute situational anxiety, defined as experiencing feelings of uneasiness or fear brought upon by an immediate situation is a commonly occurring symptom in healthcare settings, including in an Ambulatory Surgical Center [1]. Patients awaiting surgery in the perioperative room experience varying levels of anxiety in anticipation of anesthesia, operation results, postoperative pain, potential complications and concerns for family [2]. Overall prevalence of adults with preoperative anxiety ranges from 11% to 90%. Although mild levels of preoperative anxiety have been known to promote post-surgical recovery, higher levels of anxiety may contribute to adverse effects on the patient's vitals during surgery and eventual impairment in wound healing. Additionally, anxiety may heighten feelings of pain and therefore influence patient satisfaction and anesthesia consumption. It is recognized that intravenous anesthetic doses may be adjusted depending upon preoperative anxiety levels and may also result in greater requirements for postoperative analgesia. Traditional anxiolytics are known for causing side effects, such as nausea, vomiting, respiratory depression and delayed awakening may prolong length of stay and hospital admission.

Complementary and alternative medicine techniques are quickly gaining notoriety as types of safe, low-cost and easily to administer therapies for patients around the world [3-5]. A study performed at Yale found that 32% of patients undergoing ambulatory surgery utilize some form of complementary or alternative medicine perioperatively. Aromatherapy, a type of complementary medicine, is an ancient practice of inhaling plant-derived essential oils or herbal essences for improvement of health. Inhaled molecules induce physical and emotional responses by relaxing the autonomic nervous system and may result in decreased symptoms of anxiety.

The Ambulatory Surgery Center (ASC) at St. Luke's University Health Network, Bethlehem, Pennsylvania, was eager to trial alternative therapies to target preoperative anxiety in their patients. Aromatherapy was a great option over other types of complementary medicine, such as massage therapy and music therapy, based on cost effectiveness and ease with which to implement this project. Elequil aromatab stickers were selected by the ASC department to utilize in this trial. One box contains 50 tablet stickers in quantity, and costs $2.30 per tablet. Each sticker is a self-contained, self-adhesive delivery system which can be stored at room temperature for ease of access and use. Elequil tablet stickers were specifically chosen for this study because the unit can be transferred to a patient gown for use and then to the patient's own clothing upon discharge, should the patient choose to take their sticker home to continue their aromatherapy experience. Additionally, the lavender essential oil was chosen because of its known effects to reduce stress and anxiety.

Materials and Methods

Data was collected on 51 ambulatory surgery patients who consented for use of lavender aromatherapy in the preoperative phase. Once the patient entered into the bay area, a first set of vital signs was collected which included the patient's Heart Rate (HR), Blood Pressure (BP), Mean Arterial Pressure (MAP), Respiratory Rate (RR), and oxygen saturation. A visual anxiety analog scale was also given to the patient to score baseline anxiety levels (0-not anxious, 10-severely anxious) (Figure 1).

Once the patient was dressed in a surgical gown, a lavender aromatherapy sticker (Elequil Aromatab) was placed on the upper chest area of the gown. The sticker provided two options for strength of scent, "minimum scent" and "maximum scent". The sticker was set for all patients to receive the "maximum scent" levels. Thirty minutes after the sticker

***Address for Correspondence:** Kumar KN, Department of Research and Innovation, St. Luke's University Health Network-Bethlehem Campus, Bethlehem, PA, United States, E-mail: kushee-nidhi.kumar@sluhn.org*

***Received:** 03 December, 2021; **Accepted:** 17 December, 2021; **Published:** 30 December, 2021*

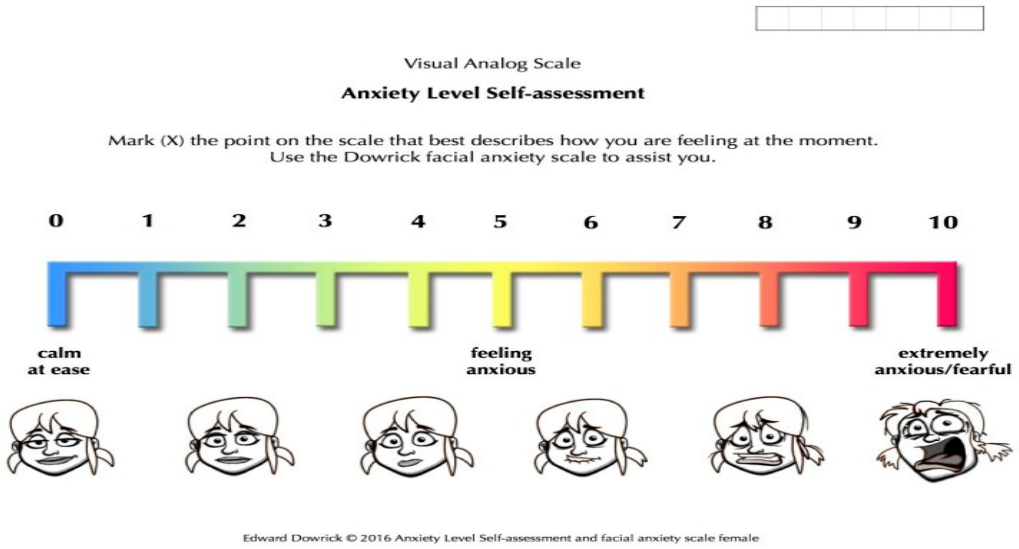

Figure 1. Visual anxiety analog scale used to score patient's anxiety levels. The scale ranged from 0 to 10, where 0 represents not anxious and 10 represents extreme anxiety.

Table 1. Severity ranges of anxiety scores. Patient anxiety score results from the visual anxiety analog scale were translated into ranges for ease of analysis.

Severity of Anxiety	Range of Anxiety Score
Not Anxious	0
Mild Anxiety Level	1-3
Moderate Anxiety Level	4-6
Severe Anxiety Level	7-10

Table 2. Severity ranges of anxiety scores from the visual anxiety analog scale. Patient anxiety scores were translated into ranges for ease of analysis.

Control Group		
Anxiety Range	**Time 0**	**After 30 Minutes**
Severe	11	9
Moderate	13	16
Mild	15	13
No Anxiety	10	11
Intervention Group		
Anxiety Range	**Time 0**	**After 30 Minutes Aromatherapy**
Severe	20	9
Moderate	20	19
Mild	11	16
No Anxiety	10	7

is placed, a second set of the vital signs was obtained to determine the effectiveness of the aromatherapy intervention. Prior to departure to the Operating Room (OR) suite, the patient was given another visual analog scale to determine the severity of anxiety after the aromatherapy. The anesthesia team also asked patients if he or she would prefer an anti-anxiety medication (midazolam) before leaving to the OR [6-9]. The aromatherapy sticker stayed on the patient gown during the intraoperative, Post-Anesthetic Care Unit (PACU), and ambulatory surgery discharge phases. Lastly, a survey was provided to the patient immediately before discharge regarding their experience with the aromatherapy.

Patients' anxiety scores before and after the aromatherapy treatment was analyzed to reflect severity of anxiety ranges (scores of 0-3 is mild anxiety level, 4-6 is moderate anxiety level, and 7-10 is severe anxiety level) (Table 1). Statistical analysis was performed via two-tailed paired testing to determine statistical significance of vital signs monitoring before and after aromatherapy treatment.

Results

Out of 51 patients in the intervention group (age range: 19 years-84 years; mean: 52.25 years), 75% (n=37) reported a decrease in their anxiety score number 30 minutes after aromatherapy use. When these scores were translated into Severity Ranges as a guide, the majority of patients (57%) experienced anxiety scores in the lower range (no anxiety to mild anxiety) after aromatherapy use as compared to their initial baseline scores that were mostly in moderate to severe anxiety range (Table 2).

The most drastic change was seen in the number of patients who scored in the "Severe" category pre-intervention, then moved to categories of lesser severity post-intervention. Anxiety score ranges of control group patients reported for comparison (Table 3). Average systolic blood pressure reduced by 7.75 mmHg; average diastolic blood pressure reduced by 6.43 mmHg (Figure 2). Thirty-nine percent of patients saw a reduction in Mean Arterial Pressure (MAP) by 10 units or more (mean MAP dropped by 6.87 mmHg) and 31% saw a reduction in heart rate by 10 units or more (mean

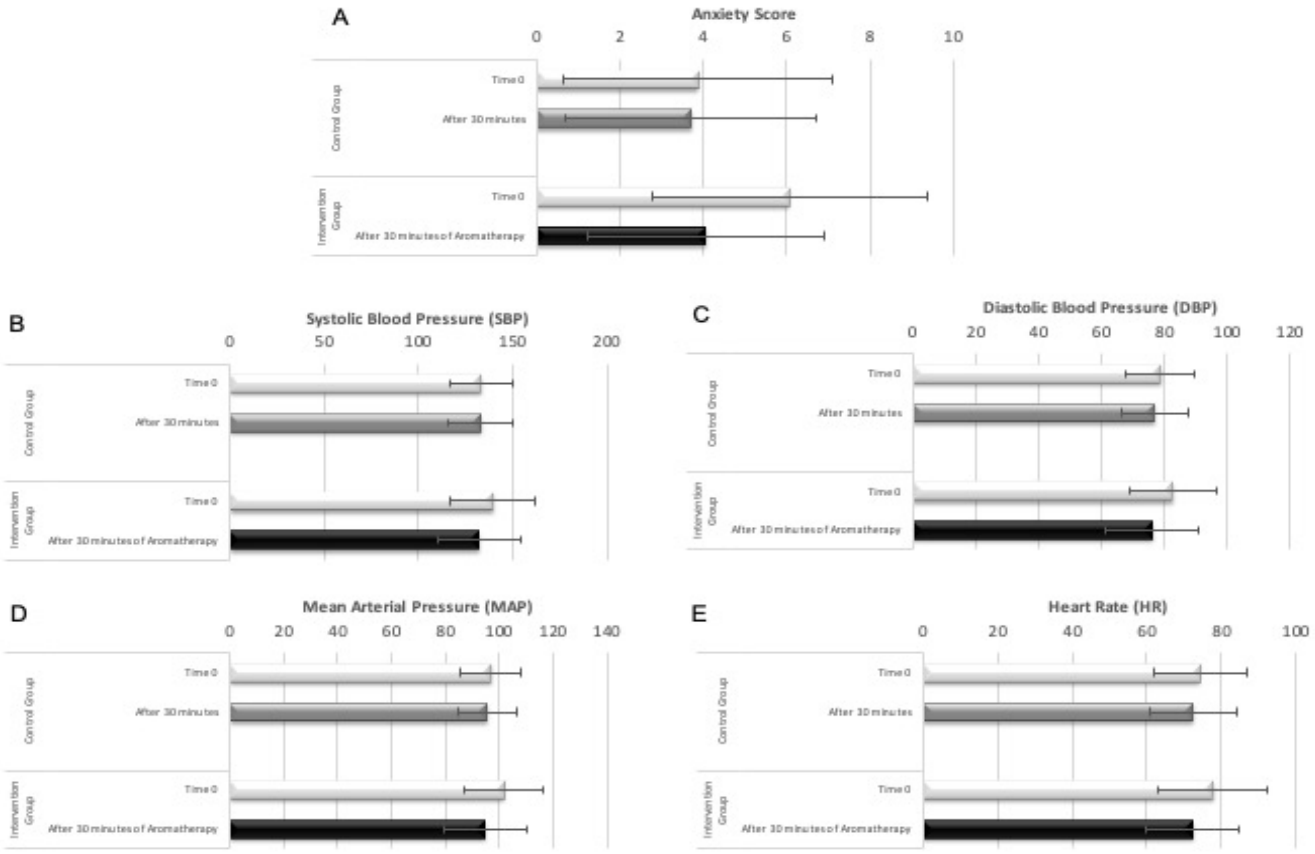

Figure 2. Comparison of (A): Anxiety score results from the Visual Anxiety Analog Scale; (B): Systolic Blood Pressure (SBP); (C): Diastolic Blood Pressure (DBP); (D): Mean Arterial Pressure (MAP); and (E): Heart rate between control group and intervention group at time 0 and after 30 minutes +/- aromatherapy, respectively.

Table 3. Descriptive statistics of intervention group.

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Age	51	19	84	52.25	16.863
Anxiety score upon arrival	51	1	21	6.08	3.316
Preop HR	51	45	109	77.67	14.456
Systolic blood pressure	51	93	195	139.67	22.389
Diastolic blood pressure	51	57	107	82.67	13.81
MAP	51	72.3333	131	101.66667	14.983398
Preop RR	47	16	22	17.81	1.837
Anxiety score	51	0	15	4.059	2.8296
HR	51	44	104	72.33	12.505
Post SBP	51	90	185	131.92	21.924
Post DBP	51	44	108	76.24	14.962
Post MAP	51	66.3333	125.6667	94.797386	15.384419
Post RR	46	16	20	17.2	1.455

HR dropped by 5.34 beats per minute) after aromatherapy use. To validate the significant reduction in vital signs after aromatherapy use, two tailed paired testing was performed which demonstrated p-values<0.05. Except for heart rate (p<0.028), none of the parameters tested in the control group demonstrated clinically significant reductions.

Discussion

The practice of aromatherapy is an ancient technique used for thousands of years by the Indians and Egyptians for alleviation of ailments. The results of our study supports the notion that lavender aromatherapy for 30 minutes has a significant impact on the improvement of vital signs, systolic and diastolic blood pressure, and anxiety scores (p value<0.05). The most drastic change was between the anxiety scores of pre and post aromatherapy intervention. This test provided a subjective measure of the perceived anxiety of the patient as compared to the objective parameters of SBP, DBP, MAP and HR, which also demonstrated clinically significant reductions. Numerous studies performed by other groups over the last decade suggest similar effects on patients. A systematic review and meta-analysis by Zhang of 20 randomized controlled trials conducted around the world indicate that aromatherapy can significantly improve preoperative anxiety in adults, compared to no intervention, placebo control, and conventional care.

Preoperative anxiety is experienced by up to 85% of patients in

ambulatory surgeries around the world. Stamenkovic reported that there are numerous risk factors that contribute an individual experiencing anxiety [2]. These include age younger than 30 years, female sex, type of surgery, type of anesthesia, shortened sleeping period, self-blaming coping methods and positive history of cancer. Many methods have been suggested to help ease the anxiety of patients during this time, such as providing more preoperative education about the surgery and anesthesia to alleviate the patient's specific concerns. Other non-pharmacological methods include complementary and alternative therapies that have also been known to be implemented, such as music therapy, massage therapy, acupuncture, self-prayer, and chiropractic treatment [10-11].

Lavender oil rose oil, or citrus species oil preparations are the most commonly used in aromatherapy techniques and also found to be most effective for perioperative anxiety. Studies report that linalool and linalyl acetate found in the lavender plant have sedative and narcotic properties and may stimulate the parasympathetic system which may contribute to the anti-anxiety effects.

The meta-analysis by Zhang, however, reported that aromatherapy for ≤ 20 minutes was found to be most effective in decreasing anxiety levels, whereas our study, which was timed for 30 minutes therapy, still found clinically significant effects. Further studies need to be conducted to determine the association with length of aromatherapy and clinical benefits for patients.

Conclusion

Limitations of the study: The anxiety scores, which measures the perceived anxiety of the patient, for the control group at time 0 is significantly lower than that of the intervention group at Time 0. This suggests that the patients in the control group perceived a less anxious state than that of the intervention group at Time 0. This may be attributed to the fact that the intervention portion of the study was conducted during the summer of 2020, where these patients were receiving ambulatory surgery at the height of the COVID-19 pandemic. In contrast, the control group's data was collected approximately a year later, when patients may have been more comfortable being in a hospital environment as the severity of the COVID-19 pandemic had generally lessened, as more patients and hospital staff were vaccinated, and had greater understanding of the necessary safety precautions overall.

References

1. Jaruzel, Candace, Mathew Gregoski, Martina Mueller, and Amanda Faircloth. "Aromatherapy for preoperative anxiety: A pilot study." *J Perianesth Nurs* 34 (2019): 259-264.
2. Stamenkovic, Dusica, Nemanja Rancic, Milan Latas, and Vojislava Neskovic, et al. "Preoperative anxiety and implications on postoperative recovery: What can we do to change our history." *Minerva Anestesiol* 84 (2018): 1307-1317.
3. Guo, Pingping, Ping Li, Xuehui Zhang, and Na Liu, et al. "The effectiveness of aromatherapy on preoperative anxiety in adults: A systematic review and meta-analysis of randomized controlled trials." *Int J Nurs Stud* 111 (2020): 103747.
4. Wang, Shu-Ming, Carol Peloquin, and Zeev N Kain. "Attitudes of patients undergoing surgery toward alternative medical treatment." *J Altern Complement Med* 8 (2002): 351-356.
5. Fayazi, Sadigheh, Monireh Babashahi, and Mehdi Rezaei. "The effect of inhalation aromatherapy on anxiety level of the patients in preoperative period." *Iran J Nurs Midwifery Res* 16 (2011): 278-283.
6. Hussain, SS and P Maheswari. "Barriers for labour analgesia in South India-knowledge and attitude of relevant stakeholders: A hospital-based cross-sectional study." *Indian J Anaesth 61* (2017): 170-173.
7. Shrivastava, D and P Chaudhary. "Perception of painless labor in rural India." *J South Asian Federation Obstetrics Gynaecology* 7 (2015): 130-133.
8. Bantug, Jose. "*A short history of medicine in the Philippines during the Spanish regime 1565-1898*." Manila: Medical Pharmaceutical College of the Philippines (1953).
9. Joven, AE. "Colonial adaptations in tropical Asia: Spanish medicine in the Philippines in the seventeenth and eighteenth centuries." *Asian Cult Stud* 38 (2012): 171-186.
10. Egay, LM. "The development of modern anesthesiology in the Philippines." *Philippine J Anesthesiol* 13 (2001): 10.
11. Toral, JA, ML Alvarez, and GD Marinas. "Factors affecting the choice for the use or non-use of analgesia and the choice of the method of analgesia during labor and delivery among obstetricians at a tertiary government institution." *Philippine Journal of Obstetrics and Gynecology* 34 (2010): 67-75.

How to cite this article: Kushee-Nidhi Kumar, Ambreen Alam, Anna Ng Pellegrino, Vikas Yellapu. "Aromatherapies can Reduce Incidence of Anxiety in Ambulatory Surgery Patients: A Pilot Study." J Clin Anesthesiol 5 (2021): 127.