



Research Article

Aromatherapy in conjunction with physical/occupational therapy in an acute care setting: Early results

A Elizabeth Koyle^{1*}, Nicole Hofmeister² and Rebecca Reding³

¹PhD, DPT, MSN, PT, RN, University Health San Antonio, USA

²MOT, OTR/L, University Health San Antonio, USA

³OTD, OTR/L, University Health San Antonio, USA

Received: 15 December, 2022

Accepted: 27 December, 2022

Published: 28 December, 2022

***Corresponding authors:** A Elizabeth Koyle, PhD, DPT, MSN, PT, RN, University Health San Antonio, USA, E-mail: amy.koyle@uhs-sa.com

Keywords: Aromatherapy; Essential oils; Physical therapy; Occupational therapy; Pain; Nausea

Copyright License: © 2022 Koyle AE, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

<https://www.peertechzpublications.com>



Abstract

Pain and nausea are common complaints by patients in acute care settings and these symptoms can prevent participation in their physical or occupational therapy sessions. Because mobilization during acute care hospitalization is important for reducing the length of stay, postoperative complications, risk for deep vein thrombosis, pneumonia, and pressure ulcers, implementing non-pharmacological solutions to engage patients in mobilization is worth investigating. It is hypothesized that the use of inhaled essential oils may improve patients' perception of pain and their coping with nausea, enabling a patient to have active participation in physical or occupational therapy. This participation can minimize hospitalization-related risks as well as potentially reduce the length of stay in the hospital.

This IRB-approved study is an early feasibility, single-site, randomized, placebo-controlled clinical trial utilizing three essential oils: lavender, mandarin, and peppermint. These oils are administered via an inhalation patch affixed to the chest region of the subject's gown. Perceived pain or nausea levels are assessed before and after the use of aromatherapy during which the subject participates in their planned physical or occupational therapy session. While it is too early to determine the effects of aromatherapy, preliminary results suggest the use of lavender oil may have a positive effect on pain.

Introduction

Essential oils have been utilized therapeutically in a wide range of settings for thousands of years. It is believed that the inhalation of these oils may activate reactions in both the brain and the lungs [1-3]. Inhaling the oils, also known as aromatherapy, may alleviate many of the untoward effects of hospitalization including boosting patients' mood and improving their coping with discomfort, pain, and nausea [2-4]. Physical and occupational therapy are important interventions for many people during acute care hospitalization. Early mobilization is important for reducing the length of stay, postoperative complications, and risk for deep vein thrombosis, pneumonia, and pressure ulcers [5,6]. Participation can also increase the chances the person can return home versus a post-acute facility. These individuals are sometimes limited in their ability to actively participate due to pain or nausea. While

pain or nausea medication may help decrease these sensations, identifying other non-pharmacologic interventions that can be provided by a rehabilitation therapist is worth investigating.

The overall findings from several studies suggest that aromatherapy can offer beneficial effects for nausea and pain tolerance [1,7-11]. Essential oils have been shown to calm, energize, and decrease perception and even relieve pain and migraines. They also enhance the immune and respiratory systems, relieve congestion, alter mood, improve neurotransmission, and heighten emotions [1,3,12]. Essential oil from the lavender flower has many uses ranging from antifungal and antibacterial applications to the treatment of headaches, stress, and muscle pain [1]. Peppermint essential oil, derived from the plant's leaves, is used as an analgesic but also supports decongestive and digestive health. The essential oil produced from the rind of mandarin possesses many uses

ranging from antidepressant and anti-anxiety properties to analgesia and fever reduction [13].

Systematic reviews and meta-analyses indicate that some research points to a significant reduction in reported pain levels, while others did not. Many studies unfortunately lacked a control group or had other poor designs. One recent, randomized controlled trial on the use of inhaled lavender aromatherapy on postoperative pain of inguinal hernia found statistically significant decreases in reported pain levels for the experimental group for all four time-stages recorded at a $p < .001$ as well as differences between groups [14]. Another meta-analysis found evidence that aromatherapy positively affects common symptoms associated with premenstrual syndrome including psychological and physical symptoms [15].

Other studies have been conducted regarding the use of ginger or peppermint for patient nausea. One particular study assessed the effect of peppermint essential oil on nausea and vomiting after cardiac surgery. This randomized clinical trial discovered a significant difference between the control and intervention groups for frequency of nausea, duration, severity, and frequency of vomiting episodes during the first four hours following extubation [9].

This research study aims to address a gap in knowledge of the effects of aromatherapy on perceived pain or nausea experienced by hospitalized patients while participating in physical or occupational therapy. We hypothesize the use of aromatherapy during a physical or occupational therapy session will allow for improved coping with pain or nausea allowing for active participation in rehabilitation. It is hoped that the reported pain or nausea level will significantly decrease over the course of the therapy session. To our knowledge, this is the first study of its kind focused on the benefit of inhaled aromatherapy administered by a physical or occupational therapist in an acute care setting.

Materials and methods

This study is an early feasibility, single-site, randomized, placebo-controlled clinical trial conducted at a large Trauma I Academic Medical Center in Texas. Full Institutional Review Board and U.S. Federal Drug Administration approval was obtained for the testing of aromatherapy to treat pain and nausea. The study consists of four arms: the three interventional arms assigned to either aromatherapy or placebo and the fourth control arm consists of subjects who are consented but unwilling to try aromatherapy.

Potential subjects include any hospitalized acute-level patient who has a current physical or occupational therapy consult on file, is 18 years of age or older, and is English or Spanish-speaking. Subjects must also express a pain or nausea score of 4 or greater on a numeric 0 to 10 scale. Exclusion criteria include respiratory disorders, cognitive impairment, inability to communicate, admission to the closed unit or psychiatry unit, known allergy to lavender, mint, or mandarin scents, a disease that causes olfactory disorders, drugs that may cause a loss of smell, pregnancy, or is a prisoner.

Subjects deceptively consent to study participation, as the aim of the study is not disclosed. Subjects are told that the use of aromatherapy in conjunction with physical or occupational therapy is being studied. Assignment to an arm is based on symptoms experienced before the therapy session begins. If a subject reports nausea symptoms, they are randomly assigned to the peppermint essential oil or a placebo. The randomization is conducted in a 1:2 ratio, one placebo to two experimental. If a patient reports pain symptoms, they are assigned to the lavender or mandarin essential oil or placebo. This randomization is also conducted in a 1:2 ratio, one placebo to two experimental. The experimental group is then randomized to a 1:1 ratio between lavender and mandarin. Those who refuse the aromatherapy patch are asked to serve as a control and receive the usual care with no patch. All subjects are asked if they received any pain or nausea medications in the last thirty minutes. Upon consent, an aromatherapy patch or placebo patch is placed on the subject's gown just distal to the collarbone. The inhalation patch consists of hydrogel cast onto polyester film, supported by non-woven polyester fabric, covered with a polyethylene film. The proprietary foil-backed lamination on the patch is used to provide an occlusive barrier that prevents any essential oil from being absorbed through the skin. The placebo patch consists of a comparable-sized felt patch with adhesive backing with no essential oil applied. The subject then participates in their physical or occupational therapy session (at least 15 minutes). After the therapy session, the subject is asked to rate their pain or nausea score on a 0 – 10 Likert scale and provide any anecdotal comments related to the aromatherapy. At this time, the aim of the study is disclosed, and which scent or placebo patch the subject was provided. Subjects may withdraw anytime from the study including the removal of the patch Table 1, Figure 1.

Results

At the time of this publication, data has been collected on 49 of the expected 200 subjects. Two subjects' data were removed from the analysis as the incorrect aromatherapy patch was administered. Of the 47 subjects remaining, the average age is 60 years old consisting of 30 females and 17 males. Nineteen of the 47 subjects received a lavender patch for pain. Ten of those subjects had an average 4.35-point decrease in reported pain levels and three with an average 3.00-point increase in pain. Six reported no change in their pain during the therapy

Table 1: Descriptive Statistics.

Group	Scent	#Subjects	Average age	Median Age	Average change in score*
Pain group	Lavender	19	60	56	(-)1.5 Points
	Mandarin	14	61	62	(-)0.08 Points
	Placebo	8	61	62	(-)0.13 Points
Nausea Group	Peppermint	5	57	64	(-)2.4 Points
	Placebo	1	58	58	(-)4 Points
Control Group	None	1	68	68	(-)1 Point

*Change in perceived pain or nausea on a 0-10 Likert scale

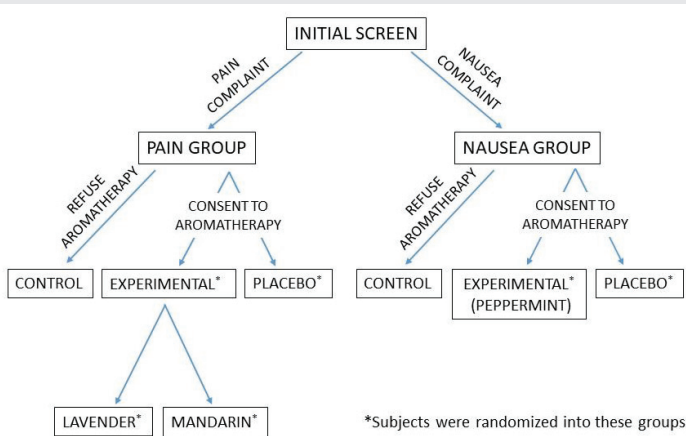


Figure 1: Method for randomized assignment to groups.

session. Fourteen subjects received a mandarin patch for pain. Four subjects reported an average 2.75-point decrease in pain and five with an average 2.00-point increase in pain. The other five reported no change in reported pain. For the group of five who received peppermint for nausea, two reported an average 6.50-point decrease in nausea symptoms while one subject reported a 1.00-point increase in symptoms. Two subjects had no change in nausea symptoms. There are eight subjects in the pain placebo group with two reporting an average 2.00-point decrease in pain, two reporting a 1.50-point increase in pain and four reporting no change in their pain during the therapy session. There is not enough data to analyze the nausea placebo (one subject) or control (one subject) groups at this time.

Subjective data is also collected regarding the subject's prior experience with aromatherapy, including if they felt the treatment is helpful during their therapy session, and any anecdotal comments. Only seven subjects (15%) reported previous experience with aromatherapy. Of the 38 subjects who were enrolled in the interventional portion of the study (received a patch with essential oils), 21 (55%) stated they thought the aromatherapy was helpful and 17 (45%) did not. Eight of the nine subjects (89%) who received a placebo patch did not feel the aromatherapy was helpful.

Many anecdotal comments were collected. For those subjects who received an interventional patch and stated it was helpful, many remarked the aroma helped them "focus" on their therapy or something other than their pain or nausea. Other comments included, "I think it helped me stay calm during exercises" and "it helps me to focus on moving...not on the pain". One subject stated, "You don't even know how much you helped me". For the 17 subjects who stated they did not find the aromatherapy helpful, a majority stated the aromatherapy "made no difference" to them.

Analysis

A full statistical analysis has not been conducted on the data but there are preliminary positive results related to the use of lavender essential oil for pain. Data will continue to be collected until sample sizes have been achieved.

Discussion

Participation in physical/occupational therapy can lead to improved outcomes and shorter hospitalization. Based on the currently collected data it is difficult to evaluate the effects of aromatherapy on the perceived level of pain or nausea during a physical or occupational therapy session. It is hoped that the use of lavender, mandarin, and peppermint aromatherapy patches decreases a subject's perceived pain or nausea levels leading to continued active participation in rehabilitation therapies. This participation can decrease hospital-related immobility risks and potentially lead to a shorter acute care hospital length of stay.

There are several limitations of this study. Because there are various patient diagnoses, levels of functional impairment, and a variety of therapeutic interventions utilized by physical and occupational therapists, it is difficult to correlate the change in pain or nausea scores solely to the use of aromatherapy. Additionally, the amount and type of pain or nausea medication administered within 30 minutes of the therapy session was not collected and may confound the results.

Conclusion

This research study aims to augment current therapeutic approaches to pain and nausea utilizing integrative therapy consisting of inhaled aromatherapy during physical/occupational therapy sessions to decrease pain or nausea and promote active participation in therapy. While it is too early to determine the effects of aromatherapy, the essential oil, lavender, has shown positive results in decreasing reported pain levels. Continued research on the effects of aromatherapy is warranted.

Acknowledgment

The authors would like to thank Dr. Charles C. Reed and University Health in San Antonio for their support of this study.

References

1. Ali BA, Al-Wabel NA, Shams S, Ahamad A, Khan S, Anwar F. Essential oils used in aromatherapy: A systemic review. *Asian Pac J Trop Biomed*. 2015; 5(8):601-611. doi:10.1016/j.apjtb.2015.05.007
2. Halligudi N, Al Ojaili M. The science and art of aromatherapy: a brief review. *J Biomed Pharm Res*. 2013; 2(2):6-14.
3. Contrada M, Cerasa A, Tonin P, Bagetta G, Scuteri D. Aromatherapy in Stroke Patients: Is it Time to Begin? *Front Behav Neurosci*. 2021 Dec 8;15:749353. doi: 10.3389/fnbeh.2021.749353. PMID: 34955776; PMCID: PMC8692756.
4. Boehm K, Büssing A, Ostermann T. Aromatherapy as an adjuvant treatment in cancer care—a descriptive systematic review. *Afr J Tradit Complement Altern Med*. 2012 Jul 1;9(4):503-18. doi: 10.4314/ajtcam.v9i4.7. PMID: 23983386; PMCID: PMC3746639.
5. Yakkanti RR, Miller AJ, Smith LS, Feher AW, Mont MA, Malkani AL. Impact of early mobilization on length of stay after primary total knee arthroplasty. *Ann Transl Med*. 2019 Feb;7(4):69. doi: 10.21037/atm.2019.02.02. PMID: 30963064; PMCID: PMC6409239.
6. Guerra ML, Singh PJ, Taylor NF. Early mobilization of patients who have had a hip or knee joint replacement reduces length of stay in hospital:



- a systematic review. *Clinical Rehabilitation*. 2015; 29(9):844-854. doi:10.1177/0269215514558641
7. Lakhan SE, Sheaffer H, Tepper D. The Effectiveness of Aromatherapy in Reducing Pain: A Systematic Review and Meta-Analysis. *Pain Res Treat*. 2016;2016:8158693. doi: 10.1155/2016/8158693. Epub 2016 Dec 14. PMID: 28070420; PMCID: PMC5192342.
8. Freeman M, Ayers C, Peterson C, Kansagara D. *Aromatherapy and Essential Oils: A Map of the Evidence*. Washington (DC): Department of Veterans Affairs (US); September 2019.
9. Maghami M, Afazel MR, Azizi-Fini I, Maghami M. The effect of aromatherapy with peppermint essential oil on nausea and vomiting after cardiac surgery: A randomized clinical trial. *Complement Ther Clin Pract*. 2020 Aug;40:101199. doi: 10.1016/j.ctcp.2020.101199. Epub 2020 May 18. PMID: 32891278.
10. Yavari Kia P, Safajou F, Shahnazi M, Nazemiyeh H. The effect of lemon inhalation aromatherapy on nausea and vomiting of pregnancy: a double-blinded, randomized, controlled clinical trial. *Iran Red Crescent Med J*. 2014 Mar;16(3):e14360. doi: 10.5812/ircmj.14360. Epub 2014 Mar 5. PMID: 24829772; PMCID: PMC4005434.
11. Johnson JR, Rivard RL, Griffin KH, Kolste AK, Joswiak D, Kinney ME, Dusek JA. The effectiveness of nurse-delivered aromatherapy in an acute care setting. *Complement Ther Med*. 2016 Apr;25:164-9. doi: 10.1016/j.ctim.2016.03.006. Epub 2016 Mar 7. PMID: 27062964.
12. Manion CR, Widder RM. Essentials of essential oils. *Am J Health Syst Pharm*. 2017 May 1;74(9):e153-e162. doi: 10.2146/ajhp151043. PMID: 28438819.
13. Farrar AJ, Farrar FC. Clinical Aromatherapy. *Nurs Clin North Am*. 2020 Dec;55(4):489-504. doi: 10.1016/j.cnur.2020.06.015. Epub 2020 Sep 28. PMID: 33131627; PMCID: PMC7520654.
14. Bagheri H, Salmani T, Nourian J, Mirrezaie SM, Abbasi A, Mardani A, Vlaisavljevic Z. The Effects of Inhalation Aromatherapy Using Lavender Essential Oil on Postoperative Pain of Inguinal Hernia: A Randomized Controlled Trial. *J Perianesth Nurs*. 2020 Dec;35(6):642-648. doi: 10.1016/j.jopan.2020.03.003. Epub 2020 Jul 21. PMID: 32709507.
15. Es-Haghee S, Shabani F, Hawkins J, Zareian MA, Nejatbakhsh F, Qaraaty M, Tabarrai M. The Effects of Aromatherapy on Premenstrual Syndrome Symptoms: A Systematic Review and Meta-Analysis of Randomized Clinical Trials. *Evid Based Complement Alternat Med*. 2020 Dec 21;2020:6667078. doi: 10.1155/2020/6667078. PMID: 33414837; PMCID: PMC7769645.

Discover a bigger Impact and Visibility of your article publication with Peertechz Publications

Highlights

- ❖ Signatory publisher of ORCID
- ❖ Signatory Publisher of DORA (San Francisco Declaration on Research Assessment)
- ❖ Articles archived in worlds' renowned service providers such as Portico, CNKI, AGRIS, TDNet, Base (Bielefeld University Library), CrossRef, Scilit, J-Gate etc.
- ❖ Journals indexed in ICMJE, SHERPA/ROMEO, Google Scholar etc.
- ❖ OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting)
- ❖ Dedicated Editorial Board for every journal
- ❖ Accurate and rapid peer-review process
- ❖ Increased citations of published articles through promotions
- ❖ Reduced timeline for article publication

Submit your articles and experience a new surge in publication services (<https://www.peertechz.com/submission>).

Peertechz journals wishes everlasting success in your every endeavours.