



The effectiveness of nurse-delivered aromatherapy in an acute care setting



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ABSTRACT

Objective: To examine the use and effectiveness of essential oil therapeutic interventions on pain, nausea, and anxiety, when provided by nurses to patients in acute hospital settings across a large health system. This study expands upon the limited body of literature on aromatherapy use among inpatients.

Design: Retrospective, effectiveness study using data obtained from electronic health records.

Setting: Ten Allina Health hospitals located in Minnesota and western Wisconsin.

Interventions: Nurse-delivered aromatherapy.

Main Outcome Measures: Change in patient-reported pain, anxiety, and nausea, rated before and after receiving aromatherapy using a numeric rating scale (0–10).

Results: There were 10,262 hospital admissions during the study time frame in which nurse-delivered aromatherapy was part of patient care. The majority of admissions receiving aromatherapy were females (81.71%) and white (87.32%). Over 75% of all aromatherapy sessions were administered via inhalation. Lavender had the highest absolute frequency (49.5%) of use regardless of mode of administration, followed by ginger (21.2%), sweet marjoram (12.3%), mandarin (9.4%), and combination oils (7.6%). Sweet marjoram resulted in the largest single oil average pain change at -3.31 units (95% CI: $-4.28, -2.33$), while lavender and sweet marjoram had equivalent average anxiety changes at -2.73 units, and ginger had the largest single oil average change in nausea at -2.02 units (95% CI: $-2.55, -1.49$).

Conclusions: Essential oils generally resulted in significant clinical improvements based on their intended use, although each oil also showed ancillary benefits for other symptoms. Future research should explore use of additional essential oils, modes of administration, and different patient populations.

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1. Background

Nurses are often responsible for assessing, managing, and treating symptoms of pain, nausea, and anxiety among hospitalized patients. Symptom management is an integral part of medical care delivered in acute care hospitals. Tens of millions of individuals are hospitalized in the U.S. in any given year, and a vast majority of them experience pain, nausea, and/or anxiety.¹ Pain among hospitalized patients affects patients across the board and is not limited

to specific populations; in other words, no patient groups within a hospitalized population are at low risk for pain.²

Since 2001, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) pain management standards require hospitals to ask patients about their pain and provide appropriate care; since January 2015, the pain management standards emphasizes the role of non-pharmacologic strategies for managing pain, adjunctive to pharmacological care when appropriate.³ Pain assessments and pain management are within the scope of nursing practice and are nursing priorities,⁴ and nurses consider themselves advocates when it comes to managing pain.⁵ Furthermore, nurses have an important role to educate patients about their options for pain medication and/or non-pharmacological pain management options.⁴

Medication-induced, chemotherapy-induced, and post-operative nausea and vomiting (PONV) are common and

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Table 1
Essential oils, chemical components, indications for use and actions for Allina Health's nurse-delivered aromatherapy program.

Essential Oil	Chemical Components		Uses	Actions
	Family	Primary Component(s)		
Ginger <i>Zingiber officinale</i>	Sesquiterpenes	α -zingiberene,	nausea, stimulates appetite, indigestion/flatulence/constipation, pain	antiemetic, digestive stimulant, analgesic, anti-inflammatory
	Monoterpenes	β -sesquiphellandrene camphene d-limonene β -myrcene		
	Aldehydes	geranial neral		
Lavender <i>Lavandula angustifolia</i>	Esters	linalyl acetate	anxiety/stress, insomnia, pain: muscular/headache, migraines	sedative, analgesic, antispasmodic, antibacterial
	Monoterpenols	linalool		
Mandarin <i>Citrus reticulata</i>	Monoterpenes	d-limonene	anxiety/stress, digestion/nausea, restlessness, constipation, insomnia	Euphoric, aids/improves digestive function
		γ -terpinene β -myrcene		
Sweet Marjoram <i>Origanum majorana</i>	Monoterpenes	γ -terpinene	pain: muscular/headache, muscle spasm, anxiety/stress, insomnia, constipation	analgesic, antispasmodic
		α -terpinene terpinolene β -myrcene		
	Monoterpenols	terpinen-4-ol linalool α -terpineol		
	Esters	sabinene hydrate linalyl acetate		

uncomfortable symptoms experienced by hospital inpatients that can lead to adverse outcomes in their recovery.⁶ It is estimated that 75 million people annually experience PONV alone.⁶ Anxiety is prevalent in the inpatient hospital setting,⁷ and has been shown to have negative outcomes in specific patient populations like heart attack patients and high risk obstetric patients.^{8,9}

Pharmacologic therapies have long been used to prevent and/or treat pain, PONV, and anxiety, but many of them have unwanted costs (related to length of stay and drug costs) and side effects.¹⁰ In particular, opioid dependence is a growing problem within the United States,¹¹ and opioid use can lead to tolerance and hyperalgesia.¹² Many patients continue to suffer from poorly managed pain despite pharmacologic intervention.^{13,14} In this context of the challenges of symptom management for hospitalized patients, the complementary use of aromatherapy may be a promising tool for nurses.

Clinical aromatherapy is the controlled and therapeutic use of essential oils in the clinical setting for specific, measurable outcomes and is a natural therapy increasingly being used to improve symptoms and maintain health and well-being during a hospital stay.¹⁵ Research on aromatherapy use has mostly been limited by single oil choices and targeted to specific populations but is promising in its results to show that therapeutic-grade essential oils are efficacious at reducing pain, nausea, and anxiety in conjunction with standard care.^{16–18}

Allina Health created an integrative health clinical service line in March 2012 and, within this service line, an operational framework for essential oil utilization and delivery was created for all nursing staff. The development of the aromatherapy program is described in detail elsewhere.¹⁹ Nurses are encouraged to offer aromatherapy as part of a holistic nursing care plan, in which they consider the whole patient rather than attending only to symptoms. This health system-wide study will examine the use and effectiveness of essential oil therapeutic interventions on pain, nausea, and anxiety, when provided by nurses to a large number of patients in an acute hospi-

tal setting. This study expands upon the currently limited body of literature on aromatherapy use among inpatients.

2. Methods

2.1. Study design and setting

This retrospective, observational study of inpatients who received nurse-delivered aromatherapy was conducted at Allina Health, based in Minneapolis, MN. Allina Health is a not-for-profit family of hospitals, clinics, and other care services throughout Minnesota and western Wisconsin. The current study took place at 10 of Allina's 12 hospitals; two hospitals did not yet offer nurse-delivered aromatherapy during the study timeframe and were therefore not included in the study.

The Penny George Institute for Health and Healing (PGIHH) at Allina Health was founded in 2003 and offers hospitalized patients, through electronic physician and nurse referrals, a wide array of integrative health services at no charge to patients.^{20,21} PGIHH was elevated to a clinical service line in 2012 and established the health system-wide nurse-delivered aromatherapy program in that year.¹⁹ Allina Health, in collaboration with PGIHH, provides the opportunity for all employed nurses to receive online training in aromatherapy delivery. Successful completion of the training allows nurses the opportunity to use aromatherapy in their nursing practice at Allina Health.

2.2. Study population

The study population included all inpatients age 18 years or older seen at any of Allina Health's ten hospitals in which nurse-provided aromatherapy was available. Patients who received nurse-delivered aromatherapy between February 1, 2012 and June 30, 2014 were retrospectively identified through electronic health records (Epic; Verona, WI) to be included in the study population. Patients seen as outpatients, in the emergency room, and who were

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