

College of Saint Benedict and Saint John's University

**DigitalCommons@CSB/SJU**

---

Celebrating Scholarship and Creativity Day

Undergraduate Research

---

4-24-2020

## Aromatherapy as an Intervention to Manage Chronic Pain in a Long-Term Care Facility: A Quality Improvement Study

Jay Friedrichs

*College of Saint Benedict/Saint John's University, jfriedric001@csbsju.edu*

Katie Long

*College of Saint Benedict/Saint John's University, KLONG001@CSBSJU.EDU*

Abby Jansen

*College of Saint Benedict/Saint John's University, AJANSEN001@CSBSJU.EDU*

Follow this and additional works at: [https://digitalcommons.csbsju.edu/ur\\_cseday](https://digitalcommons.csbsju.edu/ur_cseday)

---

### Recommended Citation

Friedrichs, Jay; Long, Katie; and Jansen, Abby, "Aromatherapy as an Intervention to Manage Chronic Pain in a Long-Term Care Facility: A Quality Improvement Study" (2020). *Celebrating Scholarship and Creativity Day*. 105.

[https://digitalcommons.csbsju.edu/ur\\_cseday/105](https://digitalcommons.csbsju.edu/ur_cseday/105)

This Paper is brought to you for free and open access by DigitalCommons@CSB/SJU. It has been accepted for inclusion in Celebrating Scholarship and Creativity Day by an authorized administrator of DigitalCommons@CSB/SJU. For more information, please contact [digitalcommons@csbsju.edu](mailto:digitalcommons@csbsju.edu).

Aromatherapy as an Intervention to Manage Chronic Pain in a  
Long-Term Care Facility: A Quality Improvement Study  
Abigail Jansen, Katie Long, and Jay Friedrichs  
The College of Saint Benedict and Saint John's University

### **Abstract**

Managing pain effectively is a widespread issue in healthcare, particularly in the elderly population. Good Shepherd Lutheran Community in Sauk Rapids, Minnesota reports high levels of chronic pain in their long-term care patients when compared to the nationwide average. This could be due to an inaccurate pain scale, inappropriate medication management, or the lack of non-pharmacological intervention. Students from the College of Saint Benedict and Saint John's University investigated this issue. Current nonpharmacological strategies in the facility include heat or cold application, mindfulness, and range of motion exercises. Pain medication, particularly opioids are used to maximize comfort.

A review of the literature suggests that the daily application of lavender oil to the inner wrists of residents has been effective in providing pain relief and distraction along with relaxation. Given time constraints, the plan included application for ten consecutive days by the unit's nurse manager. The sample for this quality improvement study includes those residents that exemplified extreme pain on the MDS, a comprehensive assessment completed to determine eligibility for Medicare and Medicaid reimbursement. Of those ten residents triggering for pain in November of 2019, five were removed due to death since assessment or a diagnosis of dementia, making them unable to provide informed consent. The implementation plan included assessing these residents' pain using a number-based scale prior to the first application, and again after the last. Implementation was halted due to the restriction of student's in the facility as a result of the COVID-19 outbreak. Anticipated results were a reduction in pain following the application of lavender; thus improved pain scores for the organization.

### Focus

For our Quality Improvement project, we chose to focus on pain management at Good Shepherd Lutheran Home in Sauk Rapids, Minnesota. Early on in the experience, one of the facility's case managers mentioned that she had noticed a trend of poorly managed pain throughout many households. We investigated this observation by looking at the Centers for Medicaid and Medicare Services (CMS) reports for Good Shepherd. Other potential issues at this facility included falls and improving function in short-term patients. We decided to focus on pain because of its crucial impact on recovery and comfort as well as there being a large amount of literature on the topic. Currently while being assessed, if residents indicate having any pain at the moment or in the last five days, they are asked to what degree this pain has impacted their daily activities or sleep. Often when asked to score their pain, residents will identify a higher pain rating on a scale of one to ten, although they might have no history of requesting as needed (PRN) medication or utilizing other strategies for management. Pain is a subjective measurement, meaning it must be taken as the resident reports it which can sometimes make control more difficult if there are inconsistencies.

It is unclear what the reason for these high pain ratings is, although it could be due to poor pain management, the use of an inadequate pain scale, or residents being unaware of alternative options available to them. Nonetheless, these higher scores reflect poorly on the staff and facility as it indicates that they are not managing pain as well as possible amongst residents compared to similar facilities. The mission of Good Shepherd commits to *ministering to the whole person through a continuum of quality services* (The Good Shepherd Lutheran Foundation, 2016). Inadequate pain control can negatively affect the facility's five-star rating, potentially destroying reputation for quality and safety. Also, if pain is poorly managed, residents

are more likely to have decreased sleep, thus impacting mood and placing them at a higher risk for depression, making this a psychosocial matter. (Harrison, Heron, & Wilson, 2016) Our goal is to suggest the implementation of a new strategy for non-pharmacological pain management at the facility. If successful, this could ultimately positively impact funding at the home and improve overall quality of life for the residents. The domino effect that pain has on other aspects of an individual's health makes this a very relevant issue and one that could have significant impact on lifespan and recovery if effectively controlled.

### **Analysis - Data Collection**

To begin our investigation, we met with the quality assurance and infection control nurses who provided us with the facility's pain scores. In order to be reimbursed by Medicare and Medicaid, a comprehensive assessment called an MDS is completed on all residents every three months or following a significant change in status such as a hospital admission or change in diagnoses. Based on the findings, a resident can trigger for a certain number of problems, including moderate to severe pain: "The numerator includes long-stay residents with a target assessment that meets the condition of either constant pain along with at least one episode of severe pain or horrible pain of any frequency." (MDS 3.0 Measure, 2017) These results are compiled into a monthly report through the Certification and Survey Provider Enhanced Reporting System (CASPER). The reports are produced by the CMS and track other issues including pressure ulcers, falls, weight loss, and urinary tract infections. For each of the categories, the facility's results are shown alongside state and nationwide numbers. As can be seen in Figure 1 below, observation of the reports from September, October, and November of 2019 showed that Good Shepherd's long-term care residents consistently had a severe pain percentage well below the state average, but above the national average. At the time of

investigation the numbers for December 2019 and January 2020 were not yet available due to processing delays.

	Residents Triggering for Mod/Severe Pain	Total LTC Residents	Facility Percent	State Average	National Average
September, 2019	7	95	6.5	11.6	6.1
October, 2019	8	92	7.9	11.3	6.0
November, 2019	10	95	9.5	11.3	6.0

Figure 1. Numbers taken from the CASPER report - MDS 3.0 Facility Level Quality Measure Report for Good Shepherd Home in Sauk Rapids, Minnesota.

While pain at Good Shepherd is well-controlled in comparison to the rest of the state, this by no means removes the need for improvement. Also, while a steady increase in pain is seen across these three months, this trend is in fact random and thus irrelevant for the purposes of this study. It is important to mention that the reports track pain separately for both short and long-term patients, as Good Shepherd has a rehabilitation unit in addition to the nursing home. Given the time constraints, for the scope of this project we focused our investigation and research on long-term care, although much of this research could be applicable to both patient populations. Along with the pain assessment associated with the MDS mentioned above, Good Shepherd currently utilizes healing touch and heat or ice application for pain control in addition to PRN and scheduled medication in long-term residents.

### **Analysis - Literature Synthesis**

Chronic pain is a widespread issue in nursing homes and long-term care facilities. Modern medicine has led to an increase in lifespan and a multitude of people are living longer with conditions that previously would lead to death. Pain that often accompanies these age-related conditions is not well understood or cared for, as it is often both consistent and severe.

Bruckenthal et al (2009) reports that chronic pain in 60 to 89 year olds is evident in 37.5 percent, and in those 90 and older the percentage jumps to 56.1. They report another study that concluded 48 percent of adults over the age 65 report chronic pain. While there are inconsistencies in some of the data, an increase in pain in this population is a widespread finding.

A significant section of the older adult population are experiencing pain which can lead to functional limitations and a decrease in overall health and happiness. Brukenenthal et al also discusses how impactful this can be on one's sleep, immune function, cognition, and mobility. Pain itself is largely a limiting factor for older adults to live their optimal life. Also, because management can be so difficult, often involving a trial and error process of different strategies and medications, frustration is common and can sometimes result in depression, lack of will, and other psychosocial matters. An overall lack of education may also cause resistance or lack of regimen adherence. Of course, if the methods are not used appropriately or inconsistently, they become ineffective. It is important for all populations, especially older adults, to understand that absence of all pain may not be possible. In some cases, multiple strategies may need to be utilized in order to see even a slight reduction.

The pain in older adults can be hard to manage and treat due to an increase in pain threshold and alterations in pharmacokinetics and pharmacodynamics while many have multiple diagnoses contributing to the pain (Bicket & Mao, 2015). Therefore, both pharmacological and nonpharmacological treatments should be used in a multimodal approach in order to more comprehensively treat the pain. An emphasis has been placed on the importance of incorporating more and more nonpharmacological pain interventions due to the underlying consequences of over using or abusing pharmacological interventions. There are a number of different

nonpharmacological interventions that have proven their effectiveness in controlling pain. One of the methods used is essential oils.

Research has shown that the constituents of essential oils, particularly lavender, actually have an analgesic effect (de Cássia da Silveira E Sá et al., 2017). They contain a vast array of chemicals that ultimately result in a reduction of pain when used correctly. Certain constituents and their chemical compounds have preventative and therapeutic effects. While the literature is still limited for some scents, research is now indicating a far greater reach of the power of these oils. This article gives the example of one compound found in oils, monoterpene perillyl alcohol, having therapeutic and preventative effects against tumors and glioblastomas. This finding exemplifies the huge impact these components add to treatment and management of a wide variety of conditions and diseases. Essential oils can be beneficial not only for the analgesia properties, but also for many others such as anticonvulsants, anti-inflammatories, and anticancers. In addition, the natural aroma that accompanies lavender can provide great relaxation, refocusing attention away from the experience of pain. These properties of essential oils aromatherapy and their minimal side effects makes them a great option in the management of pain in older adults.

### **Analysis - Root Causes**

Residents experience pain for a number of reasons. In order that the literature analysis done would be as comprehensive as possible, root causes were investigated for the ten residents triggering for pain on the CMS in November of 2019, as this was the most of the three months observed (9.5% compared to a national average of 6.0%). While these causes do not by any means represent the entire facility, they are a good starting point to address the most severe and relevant cases. We were surprised to notice that there were little to no trends in the conditions



causing the chronic pain, which resulted in our literature being much more generalized so as to suggest an intervention that could have a facility-wide impact.

Resident	Primary Sources of Pain
1	Multiple strokes resulting in continuous spasms
2	Back and R shoulder pain
3	Leg cramps, headaches
4	Arthritis in elbow and wrist
5	Chronic pain, hx of genital trauma, dementia
6	Chronic pain r/t terminal cancer
7	Migraines, dementia
8	Fibromyalgia
9	Multiple sclerosis, stage III pressure ulcer
10	Chronic back pain, headaches

Figure 2. Sources of chronic pain for 10 long-term care Good Shepherd Residents in November of 2019.

In general, pain in the long-term care setting is often triggered by chronic illness and immobility. Persistent pain in the elderly population is most commonly caused by chronic musculoskeletal disorders, specifically those of the hip, shoulder, spine, and knee. (Krasuski, Tederko, & Szczypiorowska) Quite often chronic pain can also be attributed to additional developing problems such as infections and skin or wound issues such as pressure ulcers. While much of this pain is inevitable as it accompanies aging, management with opioids should be minimized or avoided whenever possible in this population. This is because advanced age in general increases the likelihood of impaired drug absorption, maximizing the possibility of drug toxicity, which can be a fatal complication evidenced by respiratory distress. (Chang &

Compton, 2016) Therefore, this further justifies the importance of implementing a new strategy for pain control in this facility.

### **Develop - Creativity**

Because of the risk of opioid addiction and reliance in this population, it was important for us to explore only nonpharmacological pain interventions as potential solutions. The possibility of utilizing meditation was discussed, although we concluded that this may have been difficult to maintain long-term due to the extensive staff education and time that would be required, as well as the possible costs associated. Currently, the facility utilizes a number based pain scale, so we also contemplated a possible switch to a word-based scale. Thus, rather than pain being scored as a 6, it would be considered moderate. While this may have been successful in improving the accuracy of pain ratings and would have been very cost-effective, results may have been incomplete given the time constraint and size of the facility. When making our decision, we used literature and time as our greatest influences for what would produce the most clear results that would be helpful in suggesting a change in practice. We wanted our intervention to have the ease and potential to be implemented during the summer months given we found positive results.

### **Develop - Selection**

The final intervention we examined was the use of aromatherapy as a means to directly manage chronic pain. Literature suggested that this solution not only showed the most promise, but would also be the most cost-effective, time-sensitive, and least invasive of our options. A study that analyzed the effects of aromatherapy massage and aromatherapy inhalation and pain in burn patients found them to be extremely effective in providing pain and stress relief. Both of these interventions were inexpensive and noninvasive nursing tasks that can be proposed for

alleviating symptoms. (Seyyed-Rasooli & Salehi, 2016) With this, we purchased two bottles of lavender essential oils online for \$12.00, which further proves the cost effectiveness of this intervention. Good Shepherd did not have lavender available for our use given our purchase, although their cotton balls were offered for use for application purposes.

Specifically, the use of lavender-scented oil as a means to manage chronic pain has been proven to be effective. While the sense of smell can be slightly reduced in older adults, Lakhan, Sheaffer, & Tepper found that in most chronic conditions, lavender application with subsequent massage was successful in reducing stress, pain, and stiffness and improving overall mood and range of motion. (2016) Unlike almost all medications, the daily use of lavender with application to the inner wrists using a cotton ball, has extremely minimal side effects. Lavender can also provide sedating effects and may relax certain muscles. In addition to reducing pain, lavender serves as a calming agent that has also proven to be effective in controlling psychosocial symptoms, such as anxiety.

The burn study mentioned above found that the effects of aromatherapy on anxiety and pain was tested on ninety patients with burns covering less than 20% of their body. Patients were assigned to one of the three categories: aromatherapy massage, inhalation aromatherapy, and control group. The patients assigned to the massage group received a massage for half an hour using a lavender oil. The group assigned to the inhalation group also used a lavender group. The Spielberger State Anxiety Inventory was used for measuring anxiety and the visual analog scale (VAS) was used for measuring pain. The results of the study displayed a positive effect of aromatherapy massage and inhalation in reducing both anxiety and pain of these burn patients. (Seyyed-Rasooli & Salehi, 2016) The sole complication could be possible skin irritation if used more than recommended. Although massage was effective in multiple studies, given that this

would be a more invasive intervention and could jeopardize consent and possibly reduce sample size, we chose to not use this method for the purposes of this study.

### **Develop - Planning**

Prior to implementation, resident consent first needed to be received. Of those ten residents triggering for pain on the MDS, five were removed due to a diagnosis of dementia or death since November. Dementia, along with additional behavioral symptoms, is known to cause a decline in functioning and thus cause inability to consent (Passmore, 2013). Therefore, to maintain an ethically sound study, consent was only requested from those residents deemed fully competent. Residents were educated on the purpose of the study as well as the frequency of administration and intended effects. They were asked to provide a written signature of consent by one of the authors of this study. The pain sources and scores for these five residents are listed below in Figure 3.

Resident	Primary Sources of Pain
3	Leg cramps, headaches
4	Arthritis in elbows and wrist
8	Fibromyalgia
9	Multiple sclerosis, stage III pressure ulcer
10	Chronic back pain, headaches

Figure 3. Primary sources of pain for 5 long-term care residents selected for participation for elevated pain scores between September and November of 2019.

These five residents lived in two separate neighborhoods at Good Shepherd. Before beginning the trial, we intended to educate staff on the purpose of the study and appropriate application of lavender. This education would have included to whom, how often, time of day, method, location, and follow up assessments required. Because of the resources and time required to educate on the procedure to all staff, we chose to limit this education to the two case

managers of those neighborhoods, as well as to one additional case manager to serve as a back-up in the case of illness or unexpected absence. Unfortunately, due to the COVID-19 crisis, prior to beginning our education or implementation, unessential personnel, including students, were asked not to visit Good Shepherd for the safety of the residents. The anticipated execution of the study is outlined below.

### **Execute - Commitment**

Good Shepherd's values consist of service, compassion, trust, and respect. "It is through these values that we are able to provide the high level of care and Christ-like dedication to each of our residents and clients." They pride themselves on a continuum of quality services for all of their residents. Good Shepherd was very interested and open to the idea of our quality improvement project. They strive to continually improve their facility in any way they are able. As chronic pain is such a prevalent issue in nursing homes, they believe introducing non-pharmacological pain management methods is crucial and aids in providing that continuity of care. As stated on their website, "Good Shepherd is a non-profit senior living community where we care deeply about each other. Our housing and healthcare services are designed to meet the unique and personal needs of adults, while respecting their faiths, backgrounds, values and beliefs. Our culture is defined by the core values of service, compassion, trust and respect. Our calling is to create graceful living in every setting. We invite you to call the Good Shepherd Community home." This mission statement encompasses the desire for continual work and dedication towards improvement and providing quality care to live optimal lives. Thus, the intentions behind our project were well in line with Good Shepherd's mission and appropriate for the facility.

### **Execute - Implementation**

Unfortunately, because of the COVID-19 pandemic, we were no longer able to complete our clinical hours at Good Shepherd. As a result, we did not have the ability to implement our quality improvement project. However, we had come up with a well organized plan for execution and hope that our ideas are able to be implemented at a later time by a different clinical group. Our plan was to bring in our lavender essential oil and apply it to the five residents struggling with chronic pain five days a week, Monday through Friday. On days where students were not in attendance, one of three educated nurse managers would apply the lavender. We planned to apply three drops to a cotton ball and lightly rub both inner wrists of the resident. This would require staff training, so that we would maintain consistency in the time and way the essential oil was administered to the resident. We planned to assess our resident's pain status on a scale of 0-10 prior to the first administration of the essential oil and once again on that same scale of 0-10 on the final day of administration of the essential oil. We planned to document our findings and continue this process for two weeks, with the goal in mind to see some reduction in reported pain levels.

### **Execute - Evaluate**

As we did not have the chance to implement our quality improvement project, it is difficult to evaluate our project as a whole, as well as successes and failures. However, some possible obstacles and challenges we did discuss the possibility of facing were obtaining consent, as we had not yet received it. There is the unfortunate chance of some of our residents choosing not to consent and choosing not to participate in our study, which would reduce our data and possibly our credibility and validity with a smaller sample size. Another possible challenge was the consistency in application of the essential oil. It needed to be applied daily at the same time

of day for two consecutive weeks. Not only this, but the essential oil needed to be applied in a similar way in a similar location on the body for each resident. If the essential oil was forgotten on a particular resident one day or hours past the desired administration time, our consistency is compromised. Our goal for this project was to have decreased pain levels from the residents receiving the essential oil, which we consider a positive outcome.

### Resources

- Bicket, M & Mao, J. (2015) Chronic Pain in Older Adults. *Anesthesiol Clin.* 2015;33(3):577-590. doi:10.1016/j.anclin.2015.05.011
- Bruckenthal, P., et al. (2009). "Special Issues in the Management of Chronic Pain in Older Adults." *Pain Medicine*, vol. 10, no. suppl 2, 2009, doi:10.1111/j.1526-4637.2009.00667.x.
- Chang, Y., & Compton, P. (2016). Opioid Misuse/Abuse and quality persistent pain management in older adults. *Journal of Gerontological Nursing.* 42(12), 21-30. Retrieved from doi <http://dx.doi.org/10.3928/00989134-20141028-01>
- de Cássia da Silveira E Sá, R., Lima, T. C., da Nóbrega, F. R., de Brito, A., & de Sousa, D. P. (2017). Analgesic-Like Activity of Essential Oil Constituents: An Update. *International journal of molecular sciences*, 18(12), 2392. <https://doi.org/10.3390/ijms18122392>
- Harrison, L., Wilson, S., Heron, J., Stannard, C., & Munafò, M. R. (2016). Exploring the associations shared by mood, pain-related attention and pain outcomes related to sleep disturbance in a chronic pain sample. *Psychology & Health*, 31(5), 565–577. Retrieved from <https://doi-org.ezproxy.csbsju.edu/10.1080/08870446.2015.1124106>
- Lakhan, S. E., Sheaffer, H., & Tepper, D. (2016). The Effectiveness of Aromatherapy in Reducing Pain: A Systematic Review and Meta-Analysis. *Pain research and treatment.* Retrieved from <https://doi.org/10.1155/2016/8158693>
- MDS 3.0 Measure: Percent of Residents Who Self-Report Moderate to Severe Pain - Long Stay (2017)
- Passmore, M. J. (2013). Neuropsychiatric symptoms of dementia: consent, quality of life, and dignity. *BioMed Research International.* Retrieved from doi:2013/230134



Senior, Elderly Care, Living Community St. Cloud MN: Good Shepherd. (2016). Retrieved from <https://goodshepherdcampus.org/us-2/>

Tederko, P., Krasuski, M., & Szczypiorowska, B. G. (2014). Non-pharmacological pain therapies in long-term care residents: A systemic review of literature. *Journal of Pain Management*, 7(1), 37-46. Retrieved from <https://search.proquest.com/docview/1626845708?accountid=14070>

Seyyed-Rasooli, A., Salehi, F., Mohammadpoorasl, A., Goljaryan, S., Seyyedi, Z., & Thomson, B. (2016). Comparing the effects of aromatherapy massage and inhalation aromatherapy on anxiety and pain in burn patients: A single-blind randomized clinical trial. *Burns*, 42(8), 1774–1780. doi: 10.1016/j.burns.2016.06.01. Retrieved from <https://www.sciencedirect-com.ezproxy.csbsju.edu/science/article/pii/S0305417916301863>