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## Implementation of Aromatherapy with Lavender Essential Oils to Reduce Chronic Pain in the Long-Term Care Setting

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Implementation of Aromatherapy with Lavender Essential Oils to Reduce Chronic Pain in the  
Long-Term Care Setting

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## **Abstract**

Chronic pain often affects older adults in long term care facilities. The COVID-19 pandemic has further exacerbated this issue as patient activities that previously provided distraction from pain have been cancelled (Jasper, 2021). Furthermore, managing patient safety and slowing the spread of the virus have taken precedence over projects or interventions that help to effectively treat pain. In response, this quality improvement project sought to promote chronic pain management through nonpharmacologic measures. Current literature on such measures was reviewed, leading to the selection of aromatherapy with an emphasis on lavender. Utilizing funding from a Minnesota Department of Health grant for the purposes of exploring non-pharmacological pain interventions, the nursing staff of a long-term care facility in St. Cloud, Minnesota was trained to utilize aromatherapy in patch and topical forms. These aromatherapy techniques were implemented with 10 residents who consented to participate and had no contraindications to the ingredients in the oils. Evaluation of the success of these interventions in relieving pain was accomplished by a rating system. Residents were asked to rate their pain before administration of the essential oils and thirty minutes after administration. This serves as a point of comparison regarding the efficacy of the intervention. Data was collected for seven days of treatments with a focus on chronic pain reduction in the residents of the long-term care facility through non-pharmacological measures.

## **Focus**

Based on discussions with the Director of Nursing (DON) at the long-term care facility in St. Cloud, MN, the priority problem experienced by the residents is chronic pain (Kardell, 2021). Adequate pain relief remains an area of concern for long-term facilities across the country. However, this facility's DON emphasized that her facility in particular was struggling to meet

residents' pain relief needs when compared to similar long-term care facilities. This issue has been further exacerbated by the COVID-19 pandemic as patient activities that previously distracted from pain have been cancelled and preventing the spread of COVID-19 among residents has taken precedence over pain-related projects or interventions (Kardell, 2021). This is especially concerning because medical literature and research has reiterated the negative holistic impact of poorly-managed chronic pain on patients. Notably, the consequences of inadequately managed pain contribute not only to physical manifestations and comorbidities, but to serious psychological complications as well (Sheng, et. al., 2017).

Overall, there is a dire need for an effective, low-cost and approachable intervention to address the pain of the facility's residents in order to improve the community's holistic well-being and quality of life. In order to bridge this gap, this quality improvement project will implement new techniques at the facility that residents may not have utilized before in order to ease their chronic pain. Specifically, this project will research, implement, and evaluate the effectiveness of aromatherapy. Unlike more traditional pharmacological interventions, which are likely already being utilized, an intervention involving aromatherapy is very low-risk. By adding essential oils rather than additional opioid analgesics, it is possible to avoid compounding side effects of pharmacological management. Additionally, aromatherapy is generally quite cost effective. Aromatherapy can also reduce anxiety, nausea, and emotional distress, which can aid strongly in pain management (Sheng et. al, 2017).

## **Analysis**

The presence of pain in the geriatric healthcare setting is a well-documented issue, though the assessment, reporting and treatment of pain in this population can be difficult for several reasons. There is a common misconception that increased pain is synonymous with aging

(Gianni et al., 2010). When pain is an expected symptom of the aging process, it is less likely to be taken as seriously when reported by elderly patients. Although pain is not a normal part of aging, the elderly are more likely to experience pain as this population has a higher occurrence of disease, cognition changes, sensory impairments, and disabilities. These health issues also contribute to making adequate pain management more difficult to achieve. The elderly also have an increased risk of adverse drug reaction, which can make some doctors more hesitant when prescribing pain medications. When pain is uncontrolled, it can cause depression, decreased socialization, sleep disturbances, and impaired ambulation which all can exacerbate already existing pain (Gianni et al., 2010).

While chronic pain is typically elevated in older adults, the COVID-19 pandemic has further magnified this problem. COVID-19 has disproportionately affected frail, older adults in nursing homes. In response to this pandemic, nursing homes and assisted living facilities have closed down visits from family members that promoted the psychosocial health of residents. Additionally, many of the opportunities for socialization were cancelled and residents have to be socially distanced during dining. These changes resulted in several consequences (Sheikh et. al, 2021). Visitation and activities are essential for wellbeing of long-term care residents. Many residents have reported feeling socially isolated, lonely, and depressed as a result. Research has documented that social isolation and depression leads to increased prevalence of pain. Furthermore, COVID-19 has resulted in limited mobility, fewer out-of-the facility appointments to pain specialists, and decreased access to rehabilitation teams that can provide non-pharmacologic approaches for pain management (Sheikh et al., 2021).

Because chronic pain is a known issue for older adults, there are many common methods of pain management for this population. One of the most common methods of managing chronic

pain is the use of pharmacologic approach (Makris et. al, 2014). Medications such as acetaminophen or nonsteroidal anti-inflammatory drugs like ibuprofen are considered first-line treatment for older adults that experience mild-to-moderate pain. However, long-term use of these medications is to be avoided as they can pose cardiovascular, gastrointestinal, and renal risks. If NSAIDs are unsuccessful, then stronger pain medications like opioids can be trialed. It can also be beneficial to treat patients with corticosteroids, anticonvulsants, and antidepressants. The use of opioids can be problematic as dependence, addiction, or cognitive changes can occur. Alongside the pharmacologic approach, the use of nonpharmacologic methods is frequently used. Some examples of these methods include cognitive-behavioral therapy, acupuncture, mindfulness, massage, essential oils, and exercise. The major benefits of these treatments are that they are relatively low-risk and are a more cost-effective alternative to medication. However, there are few long-term studies on the true efficacy of these interventions or on the ability of older adults to sustain treatments overtime (Makris et al., 2014).

The director of nursing at this facility was interviewed about the current state of the facility concerning chronic pain. Per the director, there were several reasons given as to why managing pain in the elderly population can be difficult. One example was that residents with chronic pain tend to continue rating their pain higher in the fear that their medications will be taken away. This has partially resulted in the poor pain management scores at the facility. Some modified pain scales and education has been given to try to counteract this issue. Another reason provided was that any focus on improving moderate-severe pain management has been pushed aside due to the pressing issue of the COVID-19 pandemic. The facility had previously planned to implement a pain improvement project via a grant, but it was postponed until more recently. The final reason given was that providing pharmacological methods of pain relief is a more time-

effective method. This is a more attractive form of an intervention for those providing direct care to patients, who are often already stretched-thin (Kardell, March 31<sup>st</sup>, 2021). This facility has a long-stay pain goal of 17.83%. Their baseline rating was 22.9%. Currently, the prevalence of moderate-to-severe pain has increased to 27.82%. The percentage of moderate-to-severe pain, along with all of the information provided by the director of nursing, has shown the importance of targeting pain as a quality improvement project at this facility.

### **Development**

Many solutions exist for the treatment of chronic pain in older adults. It is possible to add medications, but this option was not selected for this project because of the risk of overmedication. Massage was also considered, but this was not selected due to the amount of time required to complete a massage during the implementation phase. Educating residents on deep breathing to reduce pain and anxiety was another option. Finally, education on mindfulness and meditation was considered. None of these options were selected, however, because they could be difficult for older adults with cognitive changes or dementia. Additionally, the extended amount of time that each of these interventions requires would be an amount that staff cannot afford on top of the chronic staffing issues that exist in most long-term care facilities. Thus, a more cost and time-effective intervention with deliberate nursing administration was sought out.

While aromatherapy can reduce pain, it also has been shown to reduce mental health concerns like anxiety and depression. It has been shown that “pain and depression are closely correlated from the perspectives of both brain regions and the neurological function system, whereby chronic pain may lead to depression,” (Sheng et. al, 2017). Because chronic pain may lead to depression, it is possible that reducing residents’ chronic pain through aromatherapy could lead to a reduction in depressive symptoms. Additionally, essential oil aromatherapy has

been studied in older adults in long-term care facilities, “resulting in decreased depression, anxiety, and stress scores,” (Tang, et. al, 2014). This demonstrates that aromatherapy could lead to a reduction of broad mental health symptoms, even beyond depression. This project does not study the impact of aromatherapy on the mental health of the residents at this facility, but a reduction in depression is a possible effect.

In particular, lavender essential oil has been shown to be effective in reducing pain and mental health symptoms. Lavender oil has been shown to lead to a “reduction in inflammation via reduction of [prostaglandins], thromboxane A2, and [leukotrienes] key inflammatory mediators,” (Ramsey, et. al, 2020). This demonstrates that lavender essential oil has properties that can physically reduce pain when applied to the body, like in a topical administration method. Not only can oils reduce the anxiety associated with pain, but they can also physically reduce pain signals according to this study. Additionally, lavender has been shown to be beneficial “for calming the nervous system, lowering blood pressure, and reducing anxiety and sensations of pain,” (Farrar & Farrar, 2020). This illustrates that lavender essential oil can also reduce the anxiety and sensations associated with pain, which ultimately reduces the sensation of pain. Lavender oil works in a variety of ways to reduce pain, both biologically reducing inflammation and psychologically reducing the associated anxiety.

Due to the above evidence and its increased circulation in medical circles, the Minnesota Department of Health announced in the fall of 2020 that new grants have been established for the purpose of developing opioid-free pain management. This is the most influential factor in addressing the issue of chronic pain at this facility. Without this grant, it is likely that the facility would struggle to find managerial support for implementing interventions such as aromatherapy without any established sources of funding. Initially, the aromatherapy project for pain control



was submitted on May 1, 2019 to the Department of Health Services (DHS) Review board. The goal was for the board to approve Performance-based Incentive Payment Program (PIPP) funding and support for the use of essential oil application in long-term care facilities. This proposal led by Project Analyst Jessica Harstad (MS, CVT) of the facility's health system was accepted in July 2019, but due to COVID-related delays, the project was not put into place until 2021 after a grant extension.

The details of the grant extension from this fall are as follows: Jessica Harstad's health system selected five participating long-term care facilities, including the facility in St. Cloud, MN, with the objective of rolling-out aromatherapy application at each site by the end of 2022. Each site was budgeted \$1,200 for aromatherapy supplies and the health system also started a contract with an aromatherapy consultant, the cost of which would be split among the five participating facilities. In addition to aromatherapy, massage and telehealth consultations with pain specialists are also components of the Pain PIPP Grant. However, this quality improvement project focuses only on the data and evaluation of aromatherapy, specifically rolled-out at this facility.

The solution selected to the problem of chronic pain in older adults in the long term care setting was aromatherapy with lavender essential oils. This was within budget for the facility as a result of the PIPP Grant. Applying essential oils, according to the health system of the facility, only requires a 2-hour online training. This means that educating staff to provide the therapy is cost-effective and relatively simple. Additionally, essential oils have relatively few health risks and are unlikely to cause harm to residents. Overall, aromatherapy with essential oils is a low-cost, simple, and likely effective method of reducing chronic pain in elderly long term care residents.

The process of implementation was simple. First, essential oils and blends were selected. The facility ordered lavender oil, calming oil (including mandarin, lavender, geranium, ylang-ylang, blue tansy, frankincense, and sandalwood), tension release (including lavender, peppermint, marjoram, blue tansy, and fractionated coconut oil), and comfort oil (including eucalyptus, black pepper, ginger, Roman chamomile, juniper, lavender, and fractionated coconut oil). Each of these oils can be applied topically as a massage oil, or it can be applied to a patch that the resident can wear on their clothing. The majority of the \$1,200 provided to the facility by the Pain PIPP grant went towards the purchase of these four liquid oils, although a small portion of essential oil patches containing the same blends were also purchased. However, each patch costs \$1.75 and thus are significantly less cost-effective than the liquid oils. As a result, the initial roll-out will focus on the application of liquid oils only in order to maximize aromatherapy cost-effectiveness. The topical application of these oils, which is the indicated method of application, is defined in the health system's policy for aromatherapy as "applying essential oils through the external skin by massage/touch with a diluted mixture of essential oil to carrier oil". The most effective level of dilution without risking skin irritation was found from the education modules and determined by the aromatherapy committee at the facility to be 3%. However, the oils can always be diluted further by combining drops with additional fractionated coconut oil.

Next, a chart review was conducted to determine which residents on the floor had moderate to severe chronic pain. A specific floor was selected for the first aromatherapy roll-out as they have many residents who struggle with chronic pain management. Each of these residents were contacted, educated about the project, and asked if they would like to participate. Those who consented to the project were assessed for any contraindications to the ingredients in the oil blends, most notably allergies, sensitivities, or skin irritations. Ultimately ten residents from the

unit were selected, and each was assigned an oil with maximum potential benefit to them, based on the ingredients and each resident's unique pain. During this preparation time of stocking the facility with materials and the selection process, the licensed nurses at the facility completed an online training through the health system's employee education modules to safely administer essential oils.

Then, the project was implemented. Orders were entered for each participant to receive aromatherapy twice a day (once in the morning, and once in the evening) and as needed for moderate to severe pain. The registered nurses completed these daily treatments as ordered. Prior to each treatment, residents were asked to rate their pain on a scale of one to ten. They were asked again approximately 30 minutes after receiving the treatment as supported by the literature (Nasiri et al., 2016). After seven days of twice daily aromatherapy treatments, a chart review was completed. Each resident's average pain rating from before aromatherapy treatments was calculated, as was their average pain rating from after aromatherapy treatments. This chart review was a method of determining the effectiveness of the lavender essential oil aromatherapy treatment.

Throughout this process, the team from the facility charged with implementing the pain reduction grant was consulted. They gave opinions on the implementation process and assisted with ordering supplies, contacting staff members, and entering orders. In terms of resources, the project required essential oils, patches for use with the oils, educational materials for the registered nurses, and the registered nurses' time (as the nurses must enter orders, conduct treatments, and assess pain ratings throughout the process).

The project is aimed to achieve a few key objectives. First, the project should determine whether lavender-containing essential oils are an effective non-pharmacological pain reduction

method for the residents on the particular floor of this facility. Additionally, it should lead to a reduction of pain in the residents on the selected unit. Lastly, the project should be a productive use of the Pain PIPP grant.

### **Dissemination and Evaluation**

The staff at St. Benedict Center was generally very receptive to the project. The facility had created a committee to implement aromatherapy in accordance with the Pain PIPP grant, and so this project was completed alongside the committee. These leadership members including registered nurses, social workers, and administrators were open and excited to implement aromatherapy. On the other hand, it is anticipated that staff nurses may be resistant to the change. This is because the staff nurses on the floor will be the caregivers implementing aromatherapy. The treatments will take extra time and effort for the floor nurses, which could lead to resistance. In order to combat this resistance, the floor nurses are being educated on the benefits of aromatherapy through the online training modules and the presentation of this project. They will be more likely to maintain motivation to complete the aromatherapy treatments if they understand how the residents will benefit.

Staff motivation to apply aromatherapy will be encouraged by including detailed information on the supported science of aromatherapy in our handout to the facility. In the education modules, nurses on the aromatherapy committee were taught that aromatic substances (essential oils) contain chemical groups that act differently on the limbic system of the body, causing unique reactions from the hypothalamus and thus resulting in the regulation of autonomic physical responses like heart rate, hunger, and pain (Jodi Baglien, 2021, 9:10-10:36). However, the information presented to support staff was very limited in scope while only the nurses on the actual aromatherapy committee received more in-depth education. Due to this gap

in learning, we determined it was important to provide more teaching to the support staff in the future, as they are the ones actually implementing the aromatherapy. Specifically, we compiled the most crucial points regarding the benefits and actions of aromatherapy on the body as, according to Kurt Lewin's Change Theory, staff members must understand the purpose and justification for this new intervention in order to embrace it moving forward (Marquis & Huston, 2021, p. 193).

The actual implementation went fairly smoothly. The main issue that became apparent on the initial day of the aromatherapy roll-out on the selected unit was a lack of understanding by both staff and residents in preparation for the roll-out. Half of the residents on the initial day of essential oil application (Tuesday, April 6th) were confused about what the therapy could do for them despite the fact that they had previously consented to participating in the study. Additionally, there was only one staff nurse per shift who was tasked with administering all the scheduled and PRN aromatherapy treatments, and it was apparent that they felt overwhelmed. As each nurse is checked off in their skilled administration of these oils, we hope that each shift will begin to have multiple RNs sharing the responsibility for scheduled/PRN aromatherapy. By splitting the number of assigned residents among several staff members, it would be possible for each nurse to really emphasize the neuroassociative conditioning aspect to maximize relaxation for pain relief and stress reduction. Thus, the quality of each intervention would likely increase while staff stress would decrease. This is crucial if we are to retain nursing support and maintain motivation in implementing aromatherapy at the facility.

Nurses also needed to be reminded frequently that administering the aromatherapy that the interventions were to be treated like any other treatment. We found that nurses had to initially be reminded to ask residents for pain levels before the treatment was administered as they would

occasionally forget the indication for the treatments and that they were not provided with a set time for when the pain level should be reassessed after aromatherapy administration. This 30-minute window must be included in future teaching and in the paper binder, as is supported by the literature review (Nasiri et al., 2016). Nurses should also be exposed and oriented to the aromatherapy treatment binder and documentation process prior to actually administering essential oils to residents. This helps not only expedite the process, but better prepares the nurses to answer any questions that residents had about the treatment.

The documentation process was overall successful. PointClickCare, the computer documentation process for administering scheduled and PRN essential oil treatments was completed with 100% completion. This is likely due to staff already being oriented to the system as part of their pre-existing duties as nurses and the long-standing expectation that all online documentation must be completed during each shift. However, it was more difficult for nurses to prioritize the same level of completion for the paper documentation in the aromatherapy binders. Despite the location of the binder on the treatment cart for the floor, nurses and staff were not as accustomed to this form of documentation and would have to be reminded. The handout created to educate staff and future meetings with the aromatherapy committee should ensure that sufficient data is being collected in accordance with the Pain PIPP grant and so that aromatherapy can be rolled-out successfully on other floors.

On the paper documentation, nurses and staff were successful in filling out the kind of oil topically applied for each resident as indicated in PointClickCare as well as the pain levels before and after administration. However, some were uncertain about what qualified as ‘effective’ versus ‘ineffective’ essential oil administration. It should be emphasized moving forward that as long as the pain level for a resident after receiving the treatment does not

increase, the treatment can be considered successful and should be documented as 'effective'. Furthermore, nurses appreciated that the aromatherapy binder included a description of the ingredients in each essential oil blend offered by the facility so that they had increased awareness of what was being applied to the skin of each resident and did not have to guess based on smell alone. Moving forward, it is recommended that this information be placed in each aromatherapy treatment binder so that all nurses and support staff involved in essential oil application will have access to specific ingredient lists.

### **Facility**

During the presentation of the outcomes of this quality improvement project, the target audience will be nurses and support staff on other units of the facility, which will roll-out aromatherapy next. The results of the project were documented on handouts, which were made available at the nursing desks on each floor and on the treatment carts for easy access during nurses' administration of the aromatherapy.

There are three learning-centered outcomes for the audience. First, the audience will have increased confidence regarding the aromatherapy intervention process. Second, the audience will demonstrate increased understanding of the documentation process for aromatherapy interventions and have this knowledge prior to the actual roll-out of aromatherapy on their unit. Third, the audience will comprehend the impact of the aromatherapy roll-out on the initial unit prior to the roll-out on their own floor. In order to help the audience meet these goals/outcomes, the handouts will include concise, but detailed information. For the first target outcome, background information on essential oils/aromatherapy for pain control in elderly populations will be taken from the detailed education modules provided to the facility's aromatherapy committee as well as any additional points found in our independent literature review. There will

be an emphasis placed on the importance of ‘selling’ the intervention to residents, supported by the science of neuroassociative conditioning. For the second target outcome, the handout will explain the documentation process for the application of aromatherapy as outlined by the Pain PIPP Grant as well as examples from the initial roll-out on the unit. For the third target outcome, the handout will share the average decrease in pain levels from before the application of essential oils to participating residents to thirty minutes after. Additionally, the handout will further prepare staff for the roll-out in other units by creating a ‘Moving Forward’ section, which will include tips and tricks that the nurses in this project found helpful in implementing aromatherapy.

On-going learning will be promoted by providing resources for continued module education and conducting hand-off to the facility staff on the aromatherapy committee. In this way, staff will be able to direct any questions to management facility leaders after the project has been completed.

In order to evaluate the effectiveness of our handout, we asked 15 employees to complete a survey. Before viewing the handout, the survey asked three questions evaluating the employees’ confidence in each of the learning outcomes. The questions were as follows: I feel confident in my understanding of how aromatherapy is applied in this facility, I feel confident in my understanding of how aromatherapy will be implemented and rolled out in this facility, and I feel confident that I understand how aromatherapy has been shown to be effective on a unit of this facility. The employees rated their confidence on a scale of one to five, with five being the most confident. We then asked the employees to view the handout and answer the same questions again afterward. This allows us to see how the employees’ confidence levels have changed as a result of the handout regarding our learning objectives.



The first question aimed to evaluate the learning outcome that the audience will have increased confidence regarding the aromatherapy intervention process. We found that the employee's confidence ratings increased by an average of 1.3 points on the confidence scale after viewing our handout. This demonstrates that our handout was able to increase staff's confidence in applying essential oils by addressing the process. This learning outcome was achieved.

The second question in the survey aimed to evaluate the learning outcome that the staff will have an increased understanding of the documentation process for aromatherapy interventions and have this knowledge prior to the actual roll-out of aromatherapy on their unit. On the survey, the employees' ratings increased by an average of 2.4 points on the confidence scale after reading the handout. This shows that the handout was effective in describing the process of aromatherapy roll-out and documentation.

The final question on the survey was intended to evaluate the final learning outcome that the staff will comprehend the impact of the aromatherapy roll-out on the first unit prior to the roll-out on their own floor. The average confidence ratings increased by 2.7 points after viewing our handout. This illustrates that the handout was effective in educating staff on the benefit of aromatherapy to the residents involved in this project.

Overall, staff indicated an increase in confidence for each question on the survey. This demonstrates that all of the handout's learning outcomes were achieved. As a result, the handout was effective in educating the staff about the quality improvement project that was completed. It also provided information about areas for improvement, allowing the staff to be successful in carrying this project forward in the facility-wide roll-out.

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