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Aromatherapy as a Non-pharmacological Complementary and Integrative Sleep Intervention for Veterans

Amy D. Stewart

Gardner-Webb University, astewart13@gardner-webb.edu

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**Aromatherapy as a Non-pharmacological Complementary and Integrative Sleep
Intervention for Veterans**

by

Amy D Stewart

A project submitted to the faculty of
Gardner-Webb University Hunt School of Nursing
in partial fulfillment of the requirements for the degree of
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Submitted by:

Approved by:

Amy D, Stewart

Brittany Hudgins, EdD, MSN, RN

7/21/21

Date

7/21/21

Date

Abstract

Twenty-seven percent to 54% of military personnel and veterans experience insomnia, with apnea and insomnia being the most common disorders in this same population. Due to high incidences of sleep disorders in the veteran population, this project sought to identify and validate a non-pharmacological intervention, aromatherapy, as a viable option for veterans with sleep problems. Aromatherapy, essential oils, have proven to be a natural, safe, low-cost, and non-pharmacological option for improving patient health outcomes and patient satisfaction.

Keywords: insomnia, sleep issues in veterans, aromatherapy, benefits of aromatherapy use, aromatherapy for sleep health issues, non-pharmacological interventions for sleep problems

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Identified Need

Identify aromatherapy as a non-pharmacological intervention that will address sleep health problems in a specific veteran population.

Problem Statement

The purpose of this project was to identify a non-pharmacological intervention to address insomnia symptoms in the veteran population. This project will answer how aromatherapy affects the rates and severity of insomnia and sleep problems over a 30-day period. The hypothesis was that aromatherapy is an effective treatment option for sleep in the veteran population.

Literature Review

Prior to starting the literature review, the Aromatherapy on the National Center for Complementary and Integrative Health website was the first access point for research. There was a limited amount of background information found on aromatherapy, although this site directed the literature review through the PubMed database.

The literature review used the following keywords: insomnia, sleep issues in veterans, aromatherapy, benefits of aromatherapy use, aromatherapy for sleep health issues, and nonpharmacological interventions for sleep problems. The database search resulted in more than 300 articles related to the keywords mentioned above. Therefore, this review focused on those studies and articles that were specific to insomnia, sleep health in the veteran population, and aromatherapy as an adjunct intervention in clinical practice.

Hughes et al. (2018) research demonstrated the need for an integrated theoretical approach to explain the prevalence of insomnia in the veteran population. Hughes et al.

(2018) acknowledged that insomnia has both a high prevalence, but also severe consequences that can affect many aspects of the veteran's life. An integrated theoretical approach was introduced that includes other behavioral medicine theories, as well as focusing on the mechanisms which occur as insomnia bridges from acute to chronic. It was concluded that additional research is needed to address the relationship between stress, sleep, resiliency, and outcomes that could impact clinical and research practices. Early recognition of sleep problems may lead to reduced probability for negative outcomes (Hughes et al., 2018).

Gilbert et al. (2015) provided background to the link between sleep disturbances and diagnoses that are common to the veteran population. Gilbert et al. (2015) highlighted the following: impact of poor sleep on outcomes related to treatment and recovery for veterans diagnosed with Post Traumatic Stress Disorder (PTSD) and Traumatic Brain Injury (TBI), sleep issues as a risk factor, tendency for TBI patients to suffer permanent sleep problems, interventions that focus on sleep should augment treatment plans, and physiological mechanisms and treatments of sleep problems in the PTSD and TBI veteran population. Sleep was identified as being an understudied problem in the veteran population, which is alarming because poor sleep health negatively impacts overall health. Gilbert et al. (2015) also noted the effectiveness of non-pharmacological interventions when added to traditional behavioral and cognitive therapies for treating sleep problems. In conclusion, understanding the role of sleep problems in this veteran population may facilitate improvement in outcomes due to a more comprehensive treatment plan.

Theadom et al. (2015) focused on the prevalence of sleep difficulties in patients that had experienced mild brain injury within 1 year, the link between sleep problems and outcomes following brain injury, and sleep quality. This longitudinal study consisted of 346 adults that had experienced a mild brain injury using a survey that assessed sleep problems at baseline, 1, 6, and 12 months. The results indicated that at 1-year post-injury, 41% identified having clinically significant sleep difficulties and 21% at a level that indicated insomnia three times greater in mild traumatic brain injury (TBI) than the general population. The final data indicated that 41% indicated improved sleep quality, 16% remained the same, and 39% worsened at 6 and 12 months assessments. The noted changes in sleep quality were not based on any specific intervention but primarily occurred spontaneously over time. Theadom et al. (2015) concluded screening for sleep problems should be done routinely following a mild brain injury and that viable interventions are needed to facilitate recovery and prevent persistent sleep difficulties from occurring.

A study by Araujo et al. (2017) focused on gaining a better understanding of the sleep disorder insomnia. This study detailed Araujo et al. (2017) findings during a systematic review of literature, which resulted in 22 studies related to insomnia. The findings of these studies indicated a need for new clinical measures with a larger scope on insomnia and more treatments that address the patient's experience of insomnia. Three themes were identified that were prevalent throughout the reviewed studies related to insomnia. These themes included: experience of insomnia, management of insomnia, and the medicalization of insomnia. Araujo et al. (2017) concluded that this type of review

may highlight the importance of qualitative approaches in future studies that may facilitate a better understanding of the complexities of insomnia.

Reis and Jones (2017) provided an overview of how essential oils may be used as a safe supportive therapy. Reis and Jones (2017) explored the use of essential oils as an adjunct in managing symptoms commonly seen in cancer patients, such as insomnia and nausea. Lavender, peppermint, and orange were identified as essential oils that may be used safely and effectively as supportive therapy. Reis and Jones (2017) identified four routes of administration for essential oils, with inhalation being the most effective and simple. Reis and Jones (2017) emphasized that health professionals should be knowledgeable about the quality and safety of essential oils before using them in clinical practice.

Dyer et al. (2016) focused on the effectiveness of inhaled aromatherapy in patients with sleep problems through a randomized controlled trial design. The study surveyed patients about their experiences after using an Aromastick with combination blends of bergamot, sandalwood, and lavender essential oils over a 13-week period. According to Dyer et al. (2016), 94% of patients reported the use of Aromastick to help with sleep and 92% reported they would continue to use it. There was noted to be a one-point improvement in sleep quality on a Likert scale with the use of an Aromastick. Dyer et al. (2016) suggested that using essential oils and blends may be effective in helping with sleep problems in adult patients.

Karadag et al. (2017) investigated the use of lavender essential oil on the sleep quality and anxiety levels of patients in the coronary intensive care unit (ICU). Karadag et al. (2017) used a randomized controlled study design that was conducted on 60 patients

located in the coronary ICU over a 15-day time period. The participants were informed and given two questionnaires prior to beginning intervention with 2% lavender essential oil inhalation and the control group did not receive the therapy. After 15 days, both groups were given the same questionnaire to complete, with a statistically significant difference in the change in favor of the intervention group. Karadag et al. (2017) concluded that lavender essential oil increased the quality of sleep and decreased anxiety levels of patients with coronary artery disease. Furthermore, Karadag et al. (2017) acknowledged that essential oils are non-invasive, cheap, easily applicable, cost-effective, independent nursing intervention that is appropriate for cardiac patients in the ICU setting.

Takeda et al. (2017) examined the effects of inhalation aromatherapy on sleep problems in an elderly population with dementia. This randomized controlled study had 19 participants that had normal sleep observed for 20 days without intervention and 20 days with inhaled aromatherapy being administered. Takeda et al. (2017) measured sleep conditions as follows: sleep latency, total sleep time, duration of the longest sustained sleep period, wake time after the onset of sleep, early morning awakening, total daytime sleep, and Neuropsychiatric Inventory. The results indicated positive effects of inhalation aromatherapy on symptoms related to sleep disturbances in elderly patients with dementia (Takeda et al., 2017).

The purpose of the literature review was to answer the question of why this need was identified. The literature yielded data that supports the need for a better understanding of sleep health problems in the veteran population and identified a non-

pharmacological intervention that may be appropriate for treating symptoms related to sleep difficulties.

Needs Assessment

Expanded Literature Review

Insomnia is the most common sleep disorder for 35% of the adult population (Matsumura & Skiba, 2020). Insomnia can negatively impact all aspects of a person's life, which can lead to poor work performance, impaired decision-making, and impaired relationships. Insomnia has many causes to include other medical diagnoses, mental disorders, lifestyle, and environmental factors. Insomnia symptoms can range from mild to severe and vary per individual. Currently, the treatment for insomnia consists of either cognitive behavioral therapy or pharmacological options. Matsumura and Skiba (2020) highlighted the high incidences of insomnia and the impact on the overall health well-being of a person.

Estes and Tice (2021) identified the unique challenge it is for clinicians to care for veterans with sleep disorders. The authors recognize the increased incidences of sleep disorders in the veteran population and how these disorders can exacerbate mental disorders. The authors sought to highlight the need for all clinicians to be familiar with the health conditions and needs of the veteran population, which can promote improved access to care. The article concludes that interprofessional collaboration will improve veteran health outcomes while enriching clinicians' knowledge and practice processes for this patient population (Estes & Tice, 2021).

Hillard et al. (2021) provided an overview of how to evaluate and manage sleep disorders in the veteran population. This article reiterated the high incidence of insomnia

in the veteran population which can lead to poor health outcomes and functional impairment. It was noted that sleep disturbances were reported in one-half to two-thirds of 2.5 million individuals that served in Iraq and Afghanistan (Hillard et al., 2021). The authors noted the challenge for Advanced Practice Registered Nurses (APRN) in treating sleep disorders in veterans, especially due to limited treatment options. The authors recommend providers utilize a patient-centered treatment approach with evidenced-based options, such as pharmacological, alternative modalities, and psychotherapy.

Folmer et al. (2020) discussed the prevalence of sleep disorders among veterans treated at Veteran Affairs (VA) medical facilities noting the significant increase in incidences from the fiscal year 2012-2018. The authors noted an increase from 7.4% to 11.8% in the diagnosis of insomnia during this same time period. Due to such a significant prevalence of insomnia, the Veterans Health Administration (VHA) is developing and implementing innovations that can improve the quality and accessibility of sleep care services for veterans.

Target Population

The target population for this DNP project was veterans assigned to the Sleep Health Integration Program. In those veterans that have given verbal consent assigned to the Sleep Health Integration Program (SHIP), how does aromatherapy as a non-pharmacological complementary and integrative health intervention compared with those veterans that have declined the intervention affect the rates and severity of insomnia and sleep problems within a 30-day timeframe?

Sponsors and Stakeholders

Sponsors have both the authority to impact and an interest in seeing a project completed, as well as the outcomes of the project. The sponsors for this project included the following groups and individuals:

- Complementary and Integrative Health Initiative team in providing initial funding through a grant,
- Executive leadership team that submitted recommendations for the committee chair and co-chairs,
- Aromatherapy committee consisting of both volunteers and recommendations from nursing leadership,
- Committee members that completed the aromatherapist certification process.

Stakeholders were those individuals that were impacted by the project. The stakeholders for this project were as follows:

- Veterans with full accessibility to aromatherapy
- Clinicians that will be able to offer aromatherapy to all veterans
- Staff nurses that will be competent to offer and administer aromatherapy to veterans in various practice settings

Organizational Assessment with SWOT Analysis

Organizational assessment is a process in which one determines the value of a project to the organization. The two areas that were focused on for this organizational assessment were marketing and workforce. The results of the marketing assessment included the following:

- Expansion of Veteran Health Administration (VHA) system-wide Whole Health initiative introduced in 2017
- Aromatherapy had been implemented at other Veteran Affairs (VA) facilities with positive outcomes, data, and feedback from both veterans and workforce

The results of the Workforce assessment included the following:

- Nursing lead initiative
- Nursing support and excitement lead the drive for grant request and approval

A SWOT analysis evaluates the Strengths, Weaknesses, Opportunities, and Threats related to the project. See Figure 1 in the supplementation materials for the SWOT analysis results for this project.

Assess Available Resources

Resources can range from personnel to materials and were assessed during the developmental phase of the project. The resources that were assessed to be available for this project were as follows:

- \$5,000 grant to cover the cost of initial training, materials, and equipment
- Established Complementary and Integrative Health programs to use as a template for this project's implementation
- Established aromatherapy programs within the organization's network
- Trained aromatherapists
- Medical Center Policy/ Standard Operating Procedures completed for each implementation unit/practice setting
- Electronic consultation clinics and documents created for aromatherapy program with training completed prior to implementation

Desired and Expected Outcomes

The following were determined to be the desired and expected outcomes for this project:

- Alternative treatment intervention for veterans with sleep issues
- Aromatherapy will be accessible to all veterans within the health care system
- Trained aromatherapist in all outlying facilities for the health care system
- Expansion of program will be validated by project results

Team Selection

The aromatherapy project team consisted of the following personnel from varying unit/practice settings within the organization:

- Eight Registered Nurses
- One Certified Nursing Assistant
- Registered Dietician
- Certified Sleep Health Specialist
- Occupational Health Nurse Practitioner/ Whole Health Facilitator
- Nurse Educator/Program Coordinator

Cost-Benefit Analysis

The cost-benefit analysis diagrams the expenses and costs for the development and implementation of this project. The primary source of funding was a Spread Innovation grant from VHA Innovators Network of \$5,000 with an additional \$9,500 awarded to the organization due to others postponing implementation. Grant funding covered training for 10 aromatherapists, supplies, equipment, and resources for 10 Aromatherapy carts. The cost of the program supplies was covered for the

implementation pilot period and was not added to the unit/practice area's budgets for a minimum of 6 months post initial implementation pilot.

Scope of Project

The scope of this project was to develop and implement an aromatherapy program within the Fayetteville, NC VA Coastal Health Care System to provide a non-pharmacological intervention for veterans with sleep and mood disorders, to promote relaxation, stress reduction, and nausea.

Goals, Objectives, and Mission Statement

Goals

The first goal of the project was to implement an aromatherapy program that will positively impact sleep quality in a designated veteran population. The second goal was to validate aromatherapy as a viable non-pharmacological intervention for sleep problems in the veteran population.

Objectives

The objectives for this project were as follows:

- After 30-days of the aromatherapy intervention veterans assigned to the designated clinic will report improved sleep quality
- Within 6-months of implementation of this project, 25% of nurses within the designated units/practice settings will have completed competency training and will be offering aromatherapy to all veterans with sleep problems assigned to these designated units/practice settings

Mission Statement

Implementing an aromatherapy program will provide veterans with sleep problems another non-pharmacological option for treatment.

Theoretical Underpinnings

This project was guided by middle-range theories which are easily adaptable for clinical practice and nursing research settings. Middle-range theories provide a foundation for generating hypotheses because of the limited number of variables or concepts and are appropriate for addressing specific populations and conditions. Middle-range theories seek to address relevant topics and solve persistent problems. Middle-range theories are characterized as being a patient problem and outcome-focused with nursing interventions correlating to patient outcomes (Wilkins, 2021).

Peplau's Interpersonal model applied most to this project, in that it focuses on the nurse-patient interpersonal relationship and their interactions in the process of identifying and resolving health-related problems. Peplau's Interpersonal model is appropriate for this project, as qualitative methods are utilized to explore a topic of interest with quantitative methods utilized to test the intervention implemented to resolve or impact the problem (Eldridge, 2021). This model was utilized as a template in this project, to determine if aromatherapy (intervention), according to the patient will impact the severity, frequency, and rate of insomnia (quantitative data), with the Insomnia Severity Index survey (qualitative data) used as an evaluative tool.

As this was a nurse-driven project, utilizing this model further demonstrates the nurse-patient interpersonal and therapeutic relationship throughout each project phase. Peplau's interpersonal model is defined by four steps: orientation, identification,

exploitation, and resolution (Eldridge, 2021). During the orientation step of this project, sleep issues were noted as the veterans' problem with aromatherapy as an intervention offered to veterans within the identification step. The exploitation step consists of the 30-day period in which veteran participants are receiving the aromatherapy (intervention) for identified sleep issues. During the final step, resolution, the patient will determine what impact, if any, the intervention had on the problem (sleep issues). It is also during this step, those veteran participants were asked to rate their satisfaction with the intervention (aromatherapy) and rate their satisfaction with the intervention being offered to veterans within this organization as an adjunctive modality.

See Appendix A for a diagram of Conceptual-Theoretical-Empirical (CTE) diagram for this project.

Working Plan

The working plan phase of the DNP project consisted of developing a detailed account of how each task would be completed prior to the implementation of the project. This step involved creating a written plan and diagram of the tasks, timeline, and budget that needed to be addressed or completed before implementation could begin.

The Work Breakdown Structure details the work and tasks to be completed before the implementation of the project (see Figure 2 in the supplemental materials). The timeline for this project was prepared by utilizing a GANTT chart to document the time of the project from the planning phase through completion (see Appendix B). The project budget was documented utilizing an Excel Spreadsheet (see Appendix C).

Planning for Evaluation

Step 6 in the DNP project was determining how the project would be evaluated. Evaluation of this project was performed by utilizing the Model of Improvement methodology, which is appropriate for Quality Improvement projects. The Model of Improvement methodology consists of two parts:

- Three fundamental questions (thinking)- Aims, Measures, and Changes
- The Plan-Do-Study-Act (PDSA) cycle (doing) to test the changes in a real work setting (How to Improve: The Model of Improvement, 2021)

Before one can initiate the PDSA cycle test, one must answer the three questions that will guide the project or process. The three questions address the following: what you want to accomplish, how will improvement be measured or determined, and what change can be made that results in improvement (How to Improve: The Model of Improvement, 2021)?

Aims- What Are We Trying to Improve?

The first aim of this project was to determine if aromatherapy as a non-pharmacological intervention could affect the nature, rate, and severity of insomnia in veterans over 30 days.

The second aim was to determine veteran participants' satisfaction rate with the intervention and with the intervention as an adjunctive modality to be offered to all veterans within this organization after utilizing it for a 30-day period.

Measures- How Will We Know That a Change Is an Improvement?

The effectiveness of aromatherapy as a non-pharmacological intervention was determined by comparing the results of veteran participants' completed Insomnia

Severity Index (ISI) surveys at baseline and post 30-day intervention (quantitative data). The veteran participants' satisfaction rates were determined by providing a numerical rating between 0-4 on a two-question questionnaire at the 30-day post-intervention mark (qualitative data).

Changes- What Changes Can Be Made That Will Result in Improvement?

The change was offering aromatherapy as an optional intervention to treat sleep problems in a designated veteran population.

Plan-Do-Study-Act (PDSA) Cycle

The PDSA cycle is “the doing” phase of the Model of Improvement process in which testing of the change occurs. The processes that occurred during this project will be discussed in detail at this time.

Plan. During this phase of the process, the team will identify what is to be tested during this project. The plan for this project was to determine if aromatherapy as a non-pharmacological intervention can positively impact sleep problems in the veteran population. This project would also seek to understand what level of satisfaction the veteran participants have with the intervention and as an adjunctive modality to be accessed by all veterans within the project organization. Aromatherapy as an intervention was offered to a designated veteran population over a 30-day period. Data was collected from baseline and 30-day post-intervention Insomnia Severity Index (ISI) surveys to determine the effectiveness of the intervention. The satisfaction rate of intervention and accessibility of intervention was determined by veteran participants completing a two-question questionnaire at the conclusion of 30-day period.

Do. Aromatherapy was offered to and accepted by 25 veterans with self-reported sleep problems to be received over a 30-day period. The participants were given a baseline ISI survey to establish a foundation for determining the impact of the intervention or change, with a follow-up ISI completed at the 30-day mark. Although veteran participants would complete the satisfaction rating questionnaire at the end of the pilot period, participants' anecdotal responses were encouraged and noted throughout the intervention period.

Study. The data collected from the baseline and 30-day post-intervention ISI surveys compared means and predicted effectiveness of the intervention. Data analysis confirmed there was an improvement in veteran participants' sleep issues, therefore validating aromatherapy as a viable option for sleep problems. The data collected from the questionnaires supported aromatherapy as a treatment option and adjunctive modality that should be accessible by all veterans within the project organization.

Act. The project team at the completion of the cycle concluded, aromatherapy as a non-pharmacological intervention is a viable option for treating sleep problems, as well as other identified health problems, in the veteran population. Furthermore, aromatherapy intervention was well received by participants and should be accessible to the entire veteran population within this health care system. The next step for this project was to expand the aromatherapy program through training and validating competency for those providers interested in offering and providing aromatherapy to their specific veteran populations. The next PDSA cycle will seek to determine the effectiveness of aromatherapy on other health problems for those veterans assigned to the Women's Clinic. This next cycle period was extended from 30-days to 60-days as the population

was larger and treatment intervention would be focused on more than one health problem.

Implementation

Step 7 in the DNP Project Process Model was Implementation. During the Implementation Phase, the following components were addressed: threat and barriers, monitoring of implementation, and project closure. Areas of most importance to these components will be discussed in the body of this paper.

Threats and Barriers

Initially, the greatest threats to the implementation of this DNP project were related to completing prerequisite tasks, such as developing clinical codes and electronic documentation templates, generating interest in the program, and ensuring the project adhered to established timelines. However, after gaining IRB approval in December 2020, the ongoing COVID-19 pandemic became a huge threat to the implementation of the project. The COVID-19 pandemic threatened the decrease in access to veterans as participants in the project. As this threat was developing there were also different barriers that were addressed.

Barriers

There were a few barriers that weighed heavily on the implementation phase: access to veteran participants, redirection of focus on implementation to COVID-19 measures, how to ensure implementation processes would be completed, and maintaining communication lines between the project partner and DNP candidate.

Access to Veteran Participants

In March 2020, the VA decreased face-to-face appointments in response to COVID-19 guidelines and measures per both local and national governmental agencies

which was ongoing during the spring 2021 semester. With these COVID-19 measures in place, the opportunities to recruit veteran participants were greatly diminished. As a result, participant recruitment had to be performed by the Sleep Specialist within her Sleep Clinic only, rather than a combination of sleep clinic and primary care setting recruitment. As the first 18 participants entered the final days of the implementation, this DNP candidate recruited veteran participants on a social media platform which ensured a minimum of 25 project participants.

Redirection of Implementation Focus

One of the concerns during this phase was the dynamic nature of the pandemic measures, which could have led to those partnered in this implementation being pulled away to focus solely on COVID-19 measures. Implementation of this project was founded upon the Sleep Specialist being able to offer the aromatherapy intervention to veterans that were experiencing sleep problems, but during the pandemic, priorities were changing almost daily. However, the project partner (Sleep Specialist) did remain focused on highlighting the potential benefits of this intervention especially during such a stressful and scary time for veterans.

How to Ensure Full Implementation

The challenge involved with this barrier was figuring out how to get the aromatherapy inhalers into the veteran participants' hands with face-to-face appointments being less than 20% of all appointments. Both the Sleep Specialist and DNP candidate utilized the Veteran Administration (VA) video connect system to offer aromatherapy to qualified and interested veterans, to gain verbal consent, and to implement the intervention. Both mailed inhalers with informational/ instructional brochures included

after performing sniff tests and verbalizing instructions via video connect system.

Utilizing this resource allowed initiate interventions without further delay due to COVID-19 measures that were in place.

How to Maintain Communication Between DNP Candidate and Project Partner

As COVID-19 measures and guidelines became stricter, this DNP candidate was unsure of how to keep communication lines open with the project partner. Being aware of the changes in how the VA would be delivering outpatient care and the increase in telework for providers, the candidate assumed there could be a negative impact on the implementation of this project. Therefore, it was imperative that the Sleep Specialist and DNP candidate made a conscious effort to keep each other informed and updated of the status of those veteran candidates that had begun the aromatherapy intervention through scheduled bi-weekly Microsoft Teams® meetings.

Monitoring of Implementation

As mentioned in the previous section, this DNP candidate relied on online meeting platforms to monitor the progress of the implementation phase. The Sleep Specialist kept track of the number of veteran participants and where they were within the implementation process, as well as provided feedback from the 7-day follow-up calls. The Sleep Specialist developed an Excel spreadsheet for documenting data from Insomnia Severity Index (ISI) surveys at baseline and 30-day mark, which was forwarded to the DNP candidate at the conclusion of the implementation phase for the first 18 participants. The baseline ISI survey results from those participants recruited by the DNP candidate were added to this spreadsheet upon receiving. The DNP candidate did follow-

up with the eight additional veteran participants at the 7-day mark and was a point of contact for questions or concerns related to aromatherapy intervention.

Project Closure

During this phase of the implementation process, it was imperative that all data was collected and readied for analysis. The DNP candidate ensured that all veteran participants' 30-day ISI surveys were completed and returned to both project partners, as indicated. The Sleep Specialist then input this data into an Excel spreadsheet and forwarded finalized spreadsheet to the DNP candidate. All data from the additional veteran participants were added to this spreadsheet by the DNP candidate in preparation for analysis and interpretation. In addition to completing the ISI survey at the 30-day mark, veteran participants were asked to rate the following two questions on a scale of 0-4 with 0- very dissatisfied to 4- very satisfied:

1. How satisfied/ dissatisfied are you with the use of Aromatherapy inhaler?
2. How satisfied/dissatisfied are you with the VA offering aromatherapy as an adjunctive modality?

The veteran participants were also encouraged to include any comments and anecdotes about their personal experiences during this project time on the final ISI survey, without adding any personal identifying information. To reiterate, the priority during the project closure phase was to ensure that all data was received from each veteran participant and documented for analysis and interpretation.

Interpretation

Step 8 of the DNP Project consisted of interpreting data compiled during the implementation phase of this project. This section discussed data, outcomes, the impact

of the implementation of this project on the chosen population, and future implications for the organization.

Quantitative Data

Quantitative data is characterized as being data that is numbers and focused on a specific component of a person's health-related experience (Fawcett, & Garity, 2009). Quantitative data seeks to explain, describe, or predict a particular theory or hypothesis. The quantitative data compiled during this project sought to describe and examine how aromatherapy interventions affect the rates and severity of insomnia in the project population. The measurement tool utilized for this project was the Insomnia Severity Index (ISI), a 7-item numerically rated self-report questionnaire that assesses the nature, severity, and impact of insomnia.

Quantitative data was also compiled based on the responses given by the project participants to the following two questions:

Rate from 4-very satisfied, 3-satisfied, 2-neutral, 1-dissatisfied, 0-very dissatisfied.

1. How satisfied/dissatisfied were you with the use of aromatherapy as an adjunctive modality?
2. How satisfied/dissatisfied were you with the Veteran Administration (VA) offering aromatherapy as an adjunctive modality?

The pie chart in Figure 3 (found in the supplemental materials) illustrates the rating of responses given to question 1 in which 82% reported being very satisfied or satisfied with their use of aromatherapy.

The pie chart in Figure 4 (found in the supplemental materials) illustrates the rating of responses given to question 2 in which 96% reported being very satisfied or satisfied with

the VA offering aromatherapy as an adjunctive modality. This data was reported by 22 of the 25 veterans that received the aromatherapy/ essential oils implementation either via inhalation or diffuser applications.

Process Improvement Data

Outcomes

There was a statistically significant change in insomnia severity index scores from baseline to 30-day follow-up for veterans that utilized the sleep blend inhaler or diffuser application. The insomnia severity index (ISI) baseline mean was 20.64 and the 30-day follow-up mean was 15.3.

The quantitative data validated the participants' satisfaction with aromatherapy as an adjunctive modality treatment option for insomnia. The data further indicated veteran participants were satisfied with the VA offering aromatherapy as an adjunctive modality to all veterans experiencing insomnia symptoms. Although some veteran participants reported insignificant changes between their ISI baseline and 30-day follow-up scores, they reported satisfaction with the treatment and offering of the treatment through the VA.

What Changed?

The most significant change as a result of the implementation of this project was the expansion of the aromatherapy program throughout the organization. The literature review has highlighted the high prevalence of sleep disorders in the veteran population, which can eventually lead to poor outcomes and functional impairment (Hilliard et al., 2021). Although there is an extremely high prevalence of sleep disorders in the veteran population, treatment options have been limited to pharmacological and/or cognitive-

behavioral treatment (CBT-I). Due to these factors, there is a renewed interest in offering a variety of treatment options for sleep disorders. Hilliard et al. (2021) suggested providers should consider alternative and complementary modalities as treatment options for sleep disorders, particularly due to documented efficacy with evidence-based guidance. The data compiled during this project further substantiates the need for change processes that will promote diverse treatment options for a larger section of the veteran population with sleep disorders.

With the completion of this implementation, there is an increased awareness of the benefits of aromatherapy as an adjunctive modality for sleep disorders, mood disturbances, and appetite as validated through this pilot implementation project data.

Impact

The implementation of this project impacted future processes for the organization, created a greater awareness of the need to provide veterans with options for treating sleep disorders, and highlighted an adjunctive modality that promotes positive outcomes for veterans suffering from insomnia.

Future processes are impacted because data from this project's implementation has validated aromatherapy as a viable treatment option for sleep disorders, mood disturbances, and appetite improvement. Providers will be able to offer veterans non-pharmacological options, as well as introduce complementary integrative health options that correlate with veteran-centered holistic care initiatives. Future processes are further impacted for nursing personnel to be able to offer and provide aromatherapy through nursing consults without requiring a physician's order. This project was piloted as a

nurse-driven initiative that can be expanded throughout the organization validated by data compiled upon the conclusion of the implementation.

The data compiled during this project will impact awareness of the benefits of aromatherapy on sleep disorders, mood disturbances, stress, and appetite in the veteran population. Although, this DNP candidate focused on sleep disorders this implementation was offered to another subset of veterans that were experiencing mood disturbances, stress, and poor appetite. At the conclusion of the implementation, executive leadership was briefed on the results and made aware of project data and responses of veteran participants to aromatherapy treatments and aromatherapy being equally accessible by all veterans within this organization.

The most important impact was the positive outcomes that were experienced by the project participants, as indicated by Insomnia Severity Index (ISI) scores and participants' feedback. The positive outcomes produced from this implementation project were demonstrated through better sleep health and overall well-being in veteran participants.

The impact of this implementation was measured through both quantitative and qualitative indicators. The quantitative measurement used was the Insomnia Severity Index tool and the qualitative indicator was two questions about participants' satisfaction or dissatisfaction with usage and access to aromatherapy. The impact was further assessed qualitatively through anecdotal statements from participants in response to their personal experiences with aromatherapy.

Sustainment

The first step in sustaining this project was through a strong commitment from executive leadership to facilitate processes for expansion that would increase accessibility to aromatherapy. This commitment from executive leadership should be multi-faceted, meaning it could range from financial backing to promotion of the project within all levels of leadership. The next step was to develop a partnership with the health system's Complementary Integrative Health team, so that aromatherapy may be offered in a variety of practice settings. Developing this partnership would, ultimately, expand the number of certified aromatherapists within the health system. These certified aromatherapists will be able to offer aromatherapy as an option in their own practices, as well as be able to provide training and validate competency for personnel within their units/departments. The success of sustainment will be achieved when all veterans within this health system have equal access to aromatherapy as an adjunctive modality regardless of Patient Aligned Care Team (PACT), provider, or health conditions.

Future Measurements

Future measurements include quantitative measurement indicators, such as Insomnia Severity Index (ISI), General Anxiety Disorder-7 (GAD-7), and Patient Health Questionnaire-9 (PHQ-9). The organization will benefit from continuing to assess the quality of this program as related to veterans' experiences and perceptions. The organization may also choose to assess the expansion of the project based on increasing the number of certified aromatherapists, training and competency validation of nursing personnel, and practice settings offering aromatherapy.

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Figure 1*SWOT Analysis*

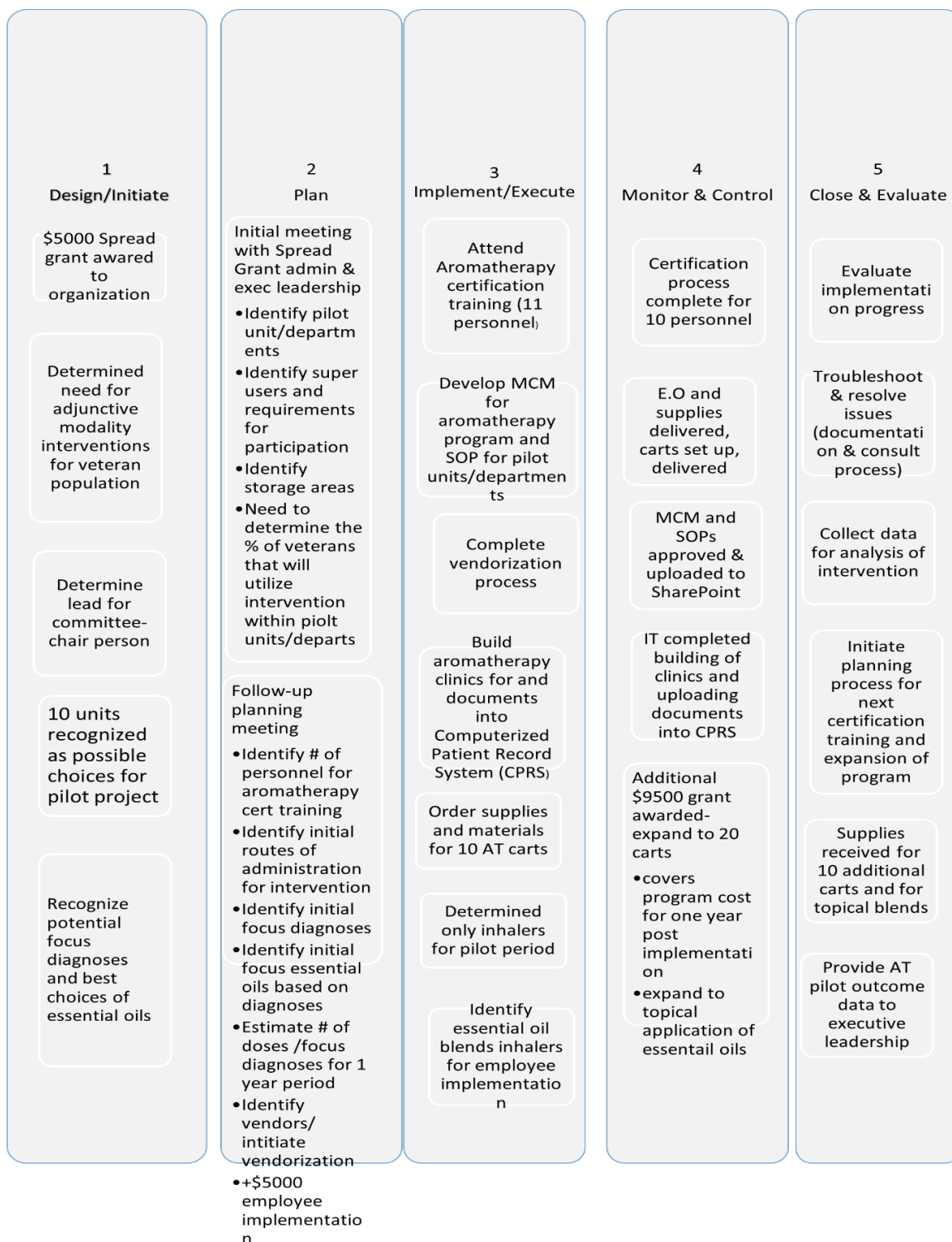
<p style="text-align: center;">Strengths</p> <ul style="list-style-type: none"> • Establish protocols within other VHA facilities • Funding for implementation approved • Interest and commitment for implementation in seven units/practice settings 	<p style="text-align: center;">Weaknesses</p> <ul style="list-style-type: none"> • Time constraints • Organizational leadership support • Limited availability of training due to implementation roll-out dates
<p style="text-align: center;">Opportunities</p> <ul style="list-style-type: none"> • Equal access to Complementary and Integrative Health (CIH) initiatives • Increases exposure to CIH therapies within VHA system • Veterans embrace CIH therapies 	<p style="text-align: center;">Threats</p> <ul style="list-style-type: none"> • Designated units/ practice settings fail to meet implementation requirements • Funding is cut or eliminated • CIH therapies are found to be ineffective in the veteran population

Table 1*Outcome Data for Sleep Wellness Blend Inhaler Within Project Population*

	Baseline ISI	30 Day F/U ISI
Mean	20.64	15.3
Variance	28.38583	50.95833
Observations	25	25
Pearson Correlation	0.594005	
Hypothesized Mean Difference	0	
df	24	
t-Stat	4.56822	
P(T<=t) one tail	6.23E-05	
t Critical one tail	1.710882	
P(T<=t) two-tail	0.000125	
T Critical two-tail	2.063899	

Figure 2

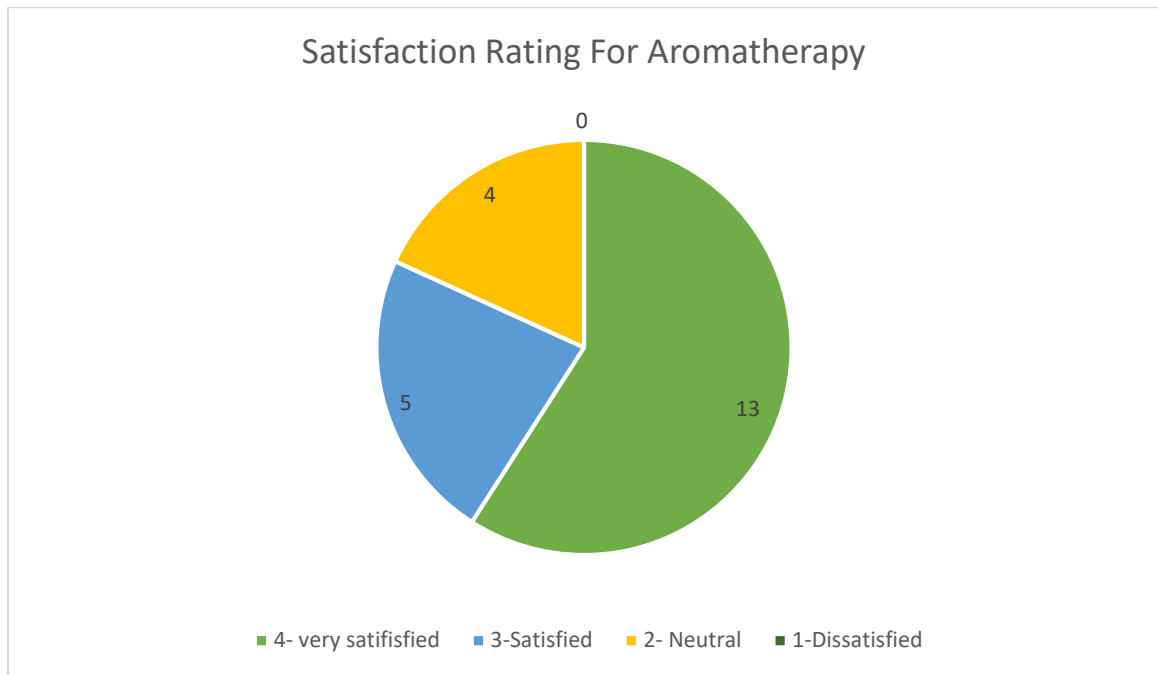
Work Breakdown Structure



Note. The Work Breakdown Structure details the work and tasks to be completed before implementation of the project.

Figure 3

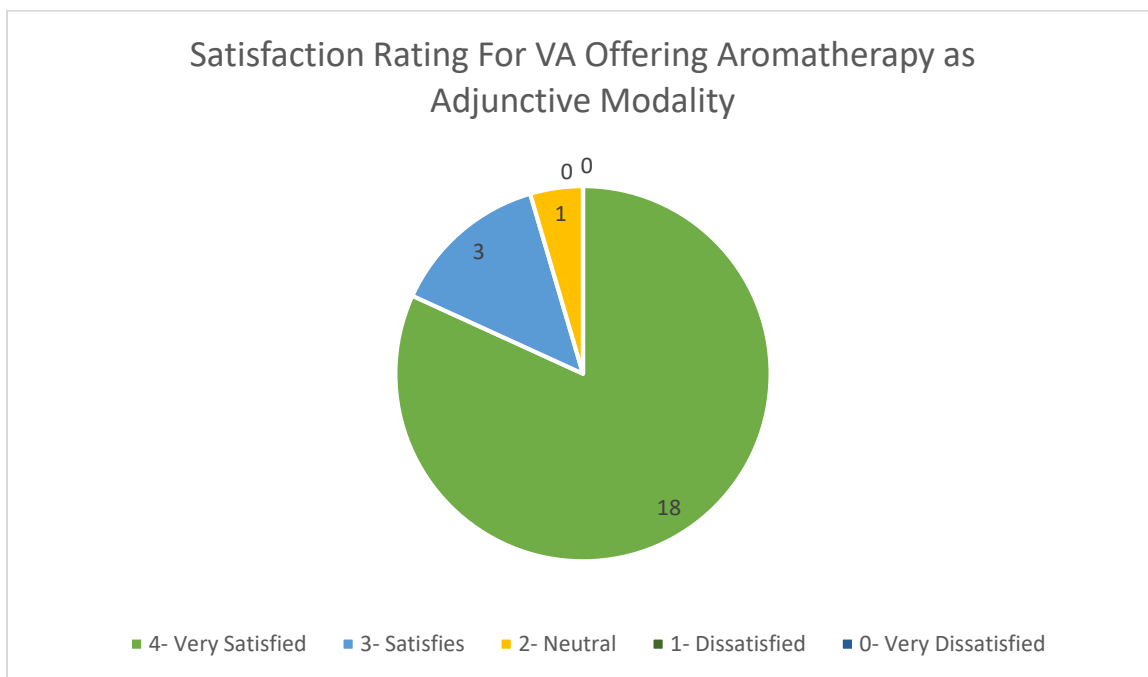
Satisfaction Rating For Use of Aromatherapy



Note. Compiled data based on responses given by 23 of the 25 project participants.

Figure 4

Satisfaction Rating For VA Offering Aromatherapy as Adjunctive Modality



Note. Compiled data based on responses given by 23 of the 25 project participants.

Appendix A

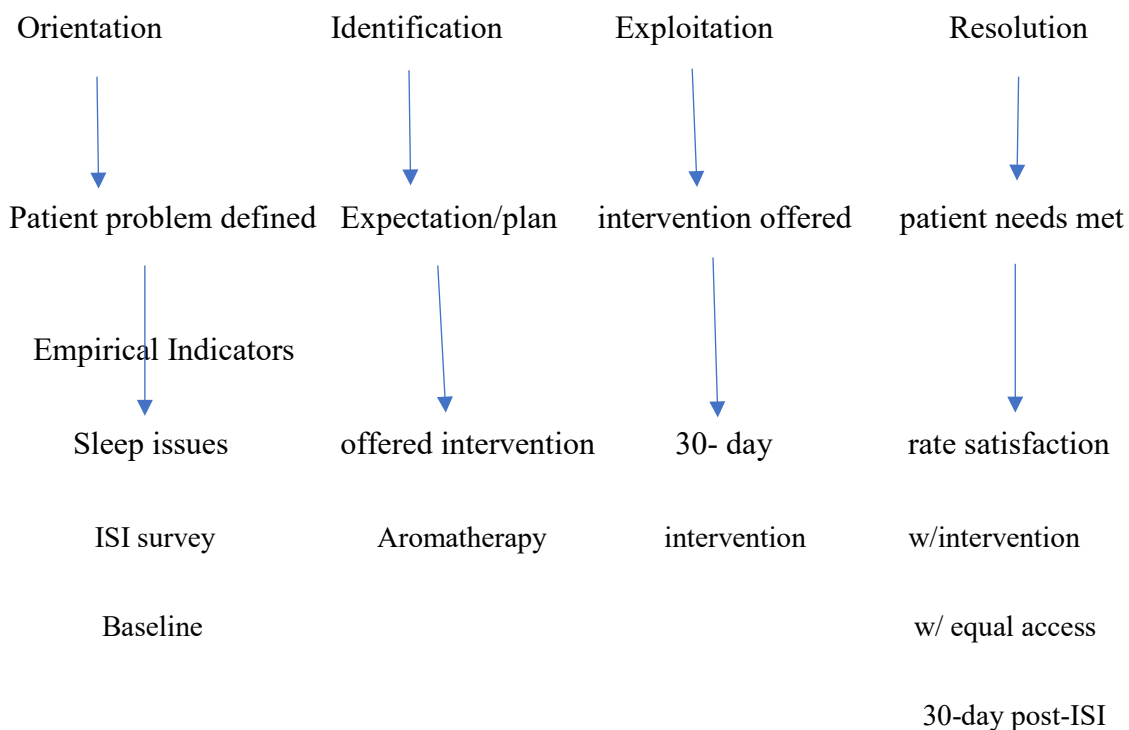
Conceptual Framework Peplau's Interpersonal Model

Conceptual Framework

Peplau's Interpersonal Model

(Making observations in nursing situations)

Middle Range Theory Concepts



Appendix A. Conceptual-theoretical-empirical diagram (CTE) for project; Aromatherapy as a non-pharmacological complementary and integrative sleep intervention for veterans.

Appendix B

GANTT Timeline for Aromatherapy Program

Fayetteville NC VA Coastal Health Care System - Aromatherapy Intervention Project

START DATE																											
October 01, 2019																											
MILESTONES	START DATE	END DATE	# of Days	YEAR ONE												YEAR TWO											
				10/19	11/19	12/19	01/20	02/20	03/20	04/20	05/20	06/20	07/20	08/20	09/20	10/20	11/20	12/20	01/21	02/21	03/21	04/21	05/21	06/21	07/21	08/21	09/21
Team & Project Scope	10/01/19	12/19/19	58																								
Needs analysis	10/01/19	10/23/19	17																								
Determine lead for project	10/01/19	10/23/19	17																								
Determine piloting units/departments	10/18/19	10/28/19	7																								
Determine diagnoses and essential oils for program	10/18/19	10/28/19	7																								
Determine requirements for super users	10/18/19	10/28/19	7																								
Identify space to be used for storage of supplies	10/18/19	12/19/19	45																								
			0																								
Program Specifics	10/25/19	03/10/20	98																								
ID # of participants for certification training	10/25/19	12/16/19	37																								
Determine routes of administration	10/25/19	10/25/19	1																								
ID vendors for essential oils and supplies	12/01/19	12/24/19	17																								
Vendorization process	12/18/19	01/25/20	28																								
Order placed for supplies and materials for AT carts	01/15/20	03/10/20	40																								
			0																								
Training, Policies, & Documentation	02/11/20	07/03/20	104																								
Aromatherapy Certification	02/11/20	03/23/20	30																								
MCP and SOP creation and approval	03/02/20	07/03/20	90																								
IT building of clinics and documents	03/16/20	04/14/20	22																								
Additional supplies received and distributed	03/16/20	03/28/20	10																								
Employee AT implementation	03/16/20	04/16/20	24																								
			0																								
Implementation	05/01/20	07/07/21	309																								
Veteran implementation	05/01/20	08/03/20	67																								
Data analysis	03/01/21	05/01/21	45																								
Pilot project data results presented to executive leadership	04/15/21	04/28/21	10																								
AT training online course (part of competency) create and publish	05/27/21	07/07/21	30																								
			0																								

Appendix C

Fayetteville, NC VA Aromatherapy Implementation Project Budget

FNCVA

Project Budget

INCOME		Budget	Actual	Difference
Spread Grant				
	Initial Award	5,000	5,000	-
	Customer Billing/Invoicing			-
	Existing Revenue Streams			-
	Other			-
	Total Internal Income	5,000	5,000	-
External Funding/Other				
	Spread Grant additional	9,500	7,700	
	Foundation Grants			(1,800)
	Donations			-
	Other			-
	Total External Income	9,500	7,700	(1,800)
Total INCOME		14,500	12,700	(1,800)
EXPENSES		Budget	Actual	Difference
Start up supplies				
	Lavender 1 oz (6)	60	120	(60)
	Orange 1 oz (6)	42	84	(42)
	Peppermint dram	5	10	(6)
	Personal inhalers (500) WHCC (\$.95/inhaler)	475	475	-
	Personal inhalers (250) 3C/ICU	238	238	-
	Personal inhalers (200) TBI/PM&R	190	380	(190)
	Personal inhalers (250) Sleep Clinic	238	238	-
	Personal inhalers (125) Dialysis	119	125	(6)
	Ginger dram	5	10	(5)
	Subtotal	1,372	1,680	(309)
Additional items for start up				
	Carts (10)	400	1,000	(600)
	Personal inhalers for Employees (1500)	1,425	1,425	-
	Staples office supplies	200	350	(150)
	Safety Books (8)	100	450	(350)
	Diffusers (2)	100	100	-
				-
	Subtotal	2,225	3,325	(1,100)
Expansion				
47	Supplies for topical blends	833	900	(67)
	Essential oils for blending	6,773	6,773	-
				-
				-
				-
				-
	Subtotal	7,606	7,673	(67)
Total EXPENSES		11,203	12,678	(1,476)
NET (Income - Expenses)		3,298	22	3,276