

REDUCING DEMENTIA-RELATED AGITATION IN LONG-TERM CARE RESIDENTS
THROUGH MUSIC THERAPY

A DOCTOR OF NURSING PRACTICE PROJECT SUBMITTED TO THE GRADUATE
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Dedication

I would like to dedicate this project in honor of my late grandmother - Alvelta Lumsden.

I'm forever grateful for her endless love, support, and encouragement.

Abstract

Background: Agitation is the most prevalent neuropsychiatric symptom of dementia. Agitation is a group of symptoms that includes excessive motor activity, irritability, tension, restlessness. As many as 80% of individuals with dementia experience increased levels of agitation. Poor management of agitation creates added stress for caregivers, patients, and family members. Therefore, providing quality care for dementia patients has become a significant challenge for our healthcare system.

Purpose: To utilize an evidence-based nonpharmacological intervention to reduce dementia-related agitation in long-term care residents at Kalakaua Gardens in Honolulu, Hawaii. This quality improvement project identified passive music therapy as the optimal nonpharmacological intervention.

Methods: Project outcomes were measured using the Pittsburg Agitation Scale (PAS). PAS scores were collected pre-and-post intervention to assess agitation severity. Resident charts were also reviewed to assess for a reduction in PRN medications and deprescribing before and during implementation.

Results: Out of 21 residents, only 19% of residents (n = 4) participated in the passive music therapy program. A total of 12 episodes of agitation were observed, addressed, and evaluated using the PAS. PAS total mean scores for each resident revealed a decrease in agitation severity after the intervention. There was a decrease in all four PAS behavioral groups after the intervention. No change was seen in the use of PRN medications or deprescribing.

Conclusion: The results suggest that passive music therapy is beneficial for the management of dementia-related agitation. The results are promising; however, additional studies are warranted as the results from this project are preliminary and limited in scope.

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Introduction

The purpose of this Doctor of Nursing Practice (DNP) project is to utilize an evidence-based nonpharmacological intervention to reduce dementia-related agitation. Agitation is one of the most common signs of dementia and commonly associated with increased levels of distress among caregivers, patients, and their family members (Sarkamo et al., 2014). As a result, providing quality care for dementia patients is a significant challenge for our healthcare system (Sarkamo et al., 2014). As the aging population grows and the prevalence of dementia increases, it is anticipated that nurses will come into contact with greater numbers of patients with dementia. Therefore, nurses will have an opportunity to play a critical role in mitigating dementia-related agitation and improving quality of care.

Problem, Background and Significance

Dementia is a syndrome characterized by deficits in cognitive function, behavior, and memory that interferes with activities of daily living. There are a number of subtypes of dementia as it is caused by a variety of pathophysiological processes (Cunningham, McGuinness, Herron, & Passmore, 2015). Alzheimer's disease is the most common subtype of dementia, accounting for approximately 75% of all dementia cases, followed by vascular dementia, dementia with Lewy bodies, and frontotemporal lobar dementia (Cunningham et al., 2015). Alzheimer's disease is distinguished from other forms of dementia due to its progressive and irreversible nature, with memory loss as the most likely initial symptom (Korolev, 2014). This project is interested in patients diagnosed with all subtypes of dementia.

Patients with dementia frequently experience a wide range of neuropsychiatric symptoms due to dysfunction of the brain's frontal lobe (Engelborghs, et al., 2006). Common neuropsychiatric symptoms of dementia include agitation, anxiety, and depression. As many as

80% of individuals with dementia experience increased agitation levels (Pedersen, Andersen, Lugo, Andreassen, & Sutterlin, 2017). Agitation is generally described as excessive motor activity with irritability, tension, and restlessness (Jutkowitz et al., 2016).

Dementia is a growing public health concern. The World Alzheimer Report (2015) estimated that 46.8 million people worldwide have dementia, and that figure is expected to double every 20 years. In 2017, over 6 million individuals in the United States were estimated to be living with clinical Alzheimer's dementia (Brookmeyer, Abdalla, Kawas, & Corrada, 2018). Approximately 42% of those individuals required specialized care equivalent to a nursing home (Brookmeyer et al., 2018). According to the Alzheimer's Association, health-related expenditures for individuals with dementia totaled roughly \$290 billion in 2019. By 2060, the number of Americans living with Alzheimer's dementia is projected to increase to 15 million (Brookmeyer et al., 2018).

Needs Assessment

Kalakaua Gardens is a privately-owned healthcare facility located on the island of Oahu in Hawaii that offers specialty care for those with dementia. The facility has a 22-bed memory care unit (MCU) with staff who provide around-the-clock care for individuals with memory loss. The MCU serves residents with all stages and forms of dementia who frequently exhibit signs of agitation. The facility's administration determined this DNP project, focusing on reducing dementia-related agitation, to be feasible and consistent with their core values. The project team consisted of the DNP student, content expert, facility administrator, director of nursing (DON), medication aides (MAs), and nurses' aides (NAs). The DON was the only RN serving on the MCU. The content expert, facility administrator, and DON provided critical oversight and support to ensure a smooth implementation process. The MAs, NAs, and DON assisted in all

phases of implementation and monitored the progress of the project. The DNP student facilitated collaboration by encouraging participation and inviting all stakeholders to take part in the decision-making process.

Literature Review

Search Strategy

An electronic search of the literature was performed using PubMed, CINAHL, and PsychInfo. Search terms included “agitation,” “dementia,” “Alzheimer’s,” “music therapy,” “music intervention,” and a combination of “non-pharmacological,” “long-term care,” “residential care,” “nursing facilities.” Boolean operators such as “AND” and “OR” were utilized. The search was limited to articles in the English language and published between 2010 and 2020. The search yielded 221 articles. After review of titles and abstracts, 13 articles were selected for inclusion in this literature synthesis (Appendix A) due to relevance, recency of publication, and strength of study.

Articles were graded and critiqued using Mosby’s Levels of Evidence. Table 1 outlines the levels of evidence and articles synthesized. A majority of articles selected for inclusion are high-quality studies. As such, this literature synthesis consisted of nine systematic reviews or meta-analyses of randomized controlled trials, one randomized controlled trial, one controlled trial, and two literature reviews.

Table 1

Mosby’s Levels of Evidence

Level	Description	Articles
I	Systematic review of meta-analysis of randomized controlled trials	9
II	At least one well-designed randomized	1

	controlled trial	
III	Well-designed controlled trials without randomization	1
IV	Well-designed case controlled or cohort studies	0
V	Systematic reviews of descriptive or qualitative studies	0
VI	Descriptive or qualitative studies	0
VII	Authority opinion, expert committee report	0
Other	Literature review, performance improvement	2

Literature Synthesis

Nonpharmacological interventions. Current guidelines indicate that nonpharmacological interventions are the first-line treatment for behavioral and psychological symptoms of dementia (Pedersen et al., 2017). Nonpharmacological interventions have been determined to be an effective and safe alternative in reducing dementia-related agitation (Oliveira et al., 2015; Livingston et al., 2015; Pedersen et al., 2017). However, historically, agitation has been managed primarily with pharmacological interventions such as antipsychotic or benzodiazepine medications. Unfortunately, the efficacy of pharmacological management is not supported by current research as it is associated with poor clinical outcomes and adverse effects such as cerebrovascular accidents, cognitive worsening, and mortality (Oliveira et al., 2015; Livingston et al., 2014; Millan-Calenti et al., 2016; Seitz et al., 2012; Jutkowitz et al., 2016).

There are a multitude of nonpharmacological interventions which target dementia-related agitation. The most common nonpharmacological approaches include music therapy, sensory

stimuli, aromatherapy, light therapy, and animal-assisted therapy. The growing body of evidence for music therapy, and one systematic review in particular, has identified music therapy as the optimal nonpharmacological intervention for reducing agitation in institutionalized dementia residents (Millan-Calenti et al., 2016).

Music therapy. Music therapy involves the use of music in a structured manner to promote positive feelings and emotional well-being (Pedersen et al., 2017; Mileski et al., 2019). Music therapy is generally categorized according to the method of administration. Passive music therapy involves listening to music without active participation (Pedersen et al., 2017; Blackburn & Bradshaw, 2014; Sarkamo et al., 2014). In contrast, active music therapy utilizes an interactive approach and involves activities such as singing, dancing, or instrument playing with or without the assistance of a professional therapist (Pedersen et al., 2017; Blackburn & Bradshaw, 2014; Sarkamo et al., 2014). Tsoi et al. (2018) conducted a systematic review and meta-analysis of randomized controlled trials comparing the effectiveness of passive versus active music therapy for patients with dementia. Findings from the study indicated that passive music therapy is more effective than active music therapy in decreasing agitation and behavioral problems among older dementia patients when compared to usual care (Tsoi et al., 2018). Additionally, studies suggest that music therapy is most effective when patient preferences are taken into account, and music choices are individualized. (Millan et al., 2016; Tsoi et al. 2018; Pedersen et al., 2017; Oliveira et al., 2015; Sarkamo et al., 2014).

Numerous studies have documented the positive effects of music as a nonpharmacological intervention. Music stimuli activate vast regions of the brain and neural connections directly involved in cognitive processing and emotional regulation (Alluri et al., 2012). Thus, the use of music enhances cognitive, social, and emotional functioning.

Additionally, music evokes past memories and cultivates feelings of positivity, and thereby mitigates signs and symptoms of agitation (Millan-Calenti et al., 2016; Sarkamo et al., 2014; Mileski et al., 2019).

Two systematic reviews and meta-analyses found statistically significant data indicating music therapy is an effective means of reducing agitation in care-home dementia residents (Tsoi et al., 2018; Ueda, Suzukamo, Sato, & Izumi, 2013). Similarly, one meta-analysis found robust data supporting the efficacy of music therapy for reducing dementia-related agitation (Pedersen et al., 2017). A recent systematic review conducted by Mileski et al. (2019) found positive improvements in both physical and mental health of long-term care residents who regularly participated in music therapy. Music therapy has been associated with improvements in blood pressure and respiratory status, and also contributes to decreased levels of agitation, anxiety, stress, and feelings of loneliness (Mileski et al., 2019). Huber et al. (2020) conducted a controlled-crossover study investigating the impact of music intervention and found a significant decrease in depression scores but no immediate effect on agitation. The controlled-crossover study was not randomized, which was a substantial limitation cited by the author.

A previous doctoral project by Lexi Kaneshiro (2018) at the University of Hawaii at Manoa found promising results involving music therapy. This DNP student performed a replication of the project designed by Kaneshiro (2018). Although similar, this project was unique in the following ways: (a) the site of implementation was a long-term care facility as opposed to an acute care facility, and (b) the patient population consisted of agitated individuals with dementia versus agitated inpatients.

Summary of Evidence (Gaps in Literature/Quality/Quantity/Consistency of Evidence)

There is an abundant amount of literature regarding the use of music therapy to manage dementia-related agitation. A majority of the literature reviewed for this project is based on high-quality evidence, as there are nine level I studies. Of the nine level I studies, commonly cited weaknesses are statistical heterogeneity, primary studies of low methodological quality, conceptual limitations, paucity of research, and inconsistency among outcome measures. However, the literature is consistent in these findings: (a) music therapy is a safe nonpharmacological intervention which is effective for the management of behavioral and psychological symptoms of dementia; (b) more research is needed regarding the long-term effectiveness of music therapy, as well as the optimal frequency and duration.

Problem Statement

Population, intervention, comparison, and outcome (PICO) statements serve as a framework for DNP projects. The PICO statement used for this DNP project was: In long-term care residents at Kalakaua Gardens with dementia (population), will passive music therapy for the management of agitation (intervention), as compared to the current practice of supervision (comparison), result in decreased levels of agitation (outcome)?

Purpose, Goals and Objectives

The purpose of this DNP project was to utilize passive music therapy to reduce dementia-related agitation in long-term care residents at Kalakaua Gardens. Project objectives included the following: (a) August 2020, provided educational training regarding music therapy to 100% of MAs, 100% of NAs, and DON; (b) September 2020, implemented a passive music-therapy program targeting 100% of agitated MCU residents with dementia; (c) December 2020, assessed for a reduction in agitation severity and decrease in antipsychotic medication use. The aim of the

project was to enhance the quality of care for long-term care residents living with dementia. Project details are outlined in a project timeline table (Appendix B).

Conceptual Framework

The conceptual framework applied to this DNP project was the Johns Hopkins Nursing Evidence-Based Practice Model (JHNEBPM; Appendix C). JHNEBPM is selected because of its applicability to practicing nurses and straight-forward approach to clinical decision-making (Dang & Dearholt, 2017). Three interrelated components guide JHNEBPM: inquiry, practice, and learning (Dang & Dearholt, 2017). The starting point of the model is inquiry. The basis of inquiry for this project is the desire to improve memory care. Subsequently, JHNEBPM utilizes a three-step process to encompass the practice component: practice question, evidence, and translation (Dang & Dearholt, 2017). The practice question formed for this project was developed after the identification of issues associated with the pharmacological management of dementia-related agitation. Afterwards, a thorough search of the evidence was conducted and yielded results supporting a change in practice. The process of translation involved implementation of passive music therapy for the management of dementia-related agitation at Kalakaua Gardens, evaluation of outcomes, and dissemination of findings. The learning component is the continuous process of acquiring new knowledge and applying it in practice, which ultimately leads to a change in behavior (Dang & Dearholt, 2017).

Project Design

Human Subjects Consideration

The DNP student has completed the Collaborative Institutional Training Initiative (CITI) training for research ethics and compliance, and Health Insurance Portability and Accountability Act (HIPAA) training on patient privacy protections. This DNP project involved making

judgments about a program to improve or further develop program effectiveness and inform decisions about future programming within an organization (University of Hawaii Human Studies program, personal communication, August 2, 2018). All of these tasks were related to quality improvement and did not produce generalizable knowledge. There was no plan to randomize participants or collect personal identifiable data. Thus, this project did not require IRB application and review.

Site and Sampling Plan

This project was implemented at Kalakaua Gardens in Honolulu. Kalakaua Gardens offers independent living, assisted living, memory care, skilled nursing, and respite care services. The MCU provides specialized care for residents with dementia and has a 22-bed-capacity. Twenty-one residents with a diagnosis of dementia reside in the MCU. In total, there are 19 staff who work on the MCU. MCU staff consist of 8 MAs, 10 NAs, and 1 DON. Project participants were MCU staff and agitated MCU residents.

The project involved MAs (8), NAs (10), and DON (1) who work on the MCU. Staff from other units were excluded. Furthermore, the project targeted 100% of agitated residents with dementia on the MCU. Residents who did not exhibit signs and symptoms of agitation were excluded.

Measurements

The Pittsburgh Agitation Scale (PAS; Appendix D) was utilized to measure project outcomes. The PAS is a validated tool that measures the severity of agitation in four behavior groups: aberrant vocalization, motor agitation, aggressiveness, and resisting care, on a scale ranging from 0 to 4, with “0” indicating no behavior present and “4” indicating significant agitation (Rosen et al., 1994). Scores from each behavior group are added together and compared

collectively. Total scores range from 0 to 16, with higher scores reflecting worsening agitation levels (Rosen et al., 1994). The PAS is selected for its ease of use and convenience, as it can be completed in less than 1-minute. The PAS does not require previous medical experience or formal training and can be completed based on caregiver observations. Permission to use the PAS is detailed in Appendix E. Furthermore, the measurement process entailed a review of resident's charts to assess the usage of "as needed" (PRN) medications and deprescribing.

Implementation and Data Collection Methods

The initial phase of the project consisted of educational training. MCU MAs, NAs, and DON attended an in-service training session led by the DNP student. Training was offered on two different days during shift report to accommodate busy schedules and promote staff participation. The educational training aimed to enhance the MCU staff's understanding of dementia, agitation, music therapy, and demonstrate the utility of the PAS measurement tool. The project timeline and implementation process were clearly communicated. Lastly, MCU staff were given an opportunity to engage with the DNP student.

Following training, MCU MAs, NAs, and DON implemented a passive music therapy program for agitated MCU residents. Implementation occurred over the course of three months. During the implementation phase, individualized music listening was offered via facility provided iPhones (1) and iPads (1) with headphones. Family member responses recorded on the music preference form (Appendix F) were used to identify the resident's preferred music. The resident's music preferences were stored as a playlist within each music device for easy access. Music listening was offered reactively and reserved for only those who exhibited signs and symptoms of agitation. MCU MAs, NAs, and DON completed the PAS before and after each

music session. Music was offered in either the namaste room, common area, or resident's room for at least 30-minutes or until the episode of agitation is resolved.

Data Analysis Methods

Scores from the PAS pre-and-post intervention were compiled, averaged, and analyzed. The use of PRN medication was reviewed to determine changes in agitation levels. Trend analysis was utilized to determine if there was a change (increase, decrease, or no change) in agitation severity.

Results

Of 19 MCU staff in total, 13 completed the educational training, which accounts for 68% of MCU staff. Among the 13 MCU staff, attendance included 75% of MAs (6), 60% of NAs (6), and DON (1). Thus, the aim of educating 100% of MCU staff was not achieved.

Throughout the implementation period, 100% of agitated MCU residents were targeted. Out of 21 MCU residents, only 19% of residents (n = 4) participated in the passive music therapy program due to signs and symptoms of agitation. The four participants were females of advanced age with diagnoses of either Alzheimer's disease or unspecified dementia without behavioral disturbance. A total of 12 episodes of agitation were observed, addressed, and evaluated using the PAS. Each of the four residents received the intervention on more than one occasion. Table 2 highlights the PAS total mean scores for each resident before and after the intervention. Overall, post-intervention scores for each resident indicated a decrease in agitation severity.

Table 2

PAS Mean Scores

Resident	# of Agitation Episodes	Pre-Intervention	Post-Intervention
1	2	10.00	1.50
2	2	11.00	5.00
3	3	7.33	1.00
4	5	9.80	5.00
Total	12	9.42	3.42

Individual scores recorded within each PAS behavioral group were pooled and analyzed collectively, as seen in Table 3. Likewise, Table 3 details the PAS mean, median, and mode scores for each behavioral group before and after the intervention. Figure 1 shows a decrease in all four behavioral groups after receiving the intervention. The most severe agitated behavior exhibited was aberrant vocalizations ($M = 2.92$), and the least severe behavior being aggressiveness ($M = 1.75$). The intervention had the most notable impact on resisting care, resulting in the largest percent decrease, 71%.

Table 3 -

PAS Behavior Groups

		Mean	Median	Mode
Pre-Intervention	Aberrant Vocalizations	2.92	3	3
	Motor Agitation	2.42	3	3
	Aggressiveness	1.75	1.50	0
	Resisting Care	2.33	2	2
Post-Intervention	Aberrant Vocalizations	1.08	1	1
	Motor Agitation	1.00	0.50	0
	Aggressiveness	0.67	0	0
	Resisting Care	0.67	0.50	0

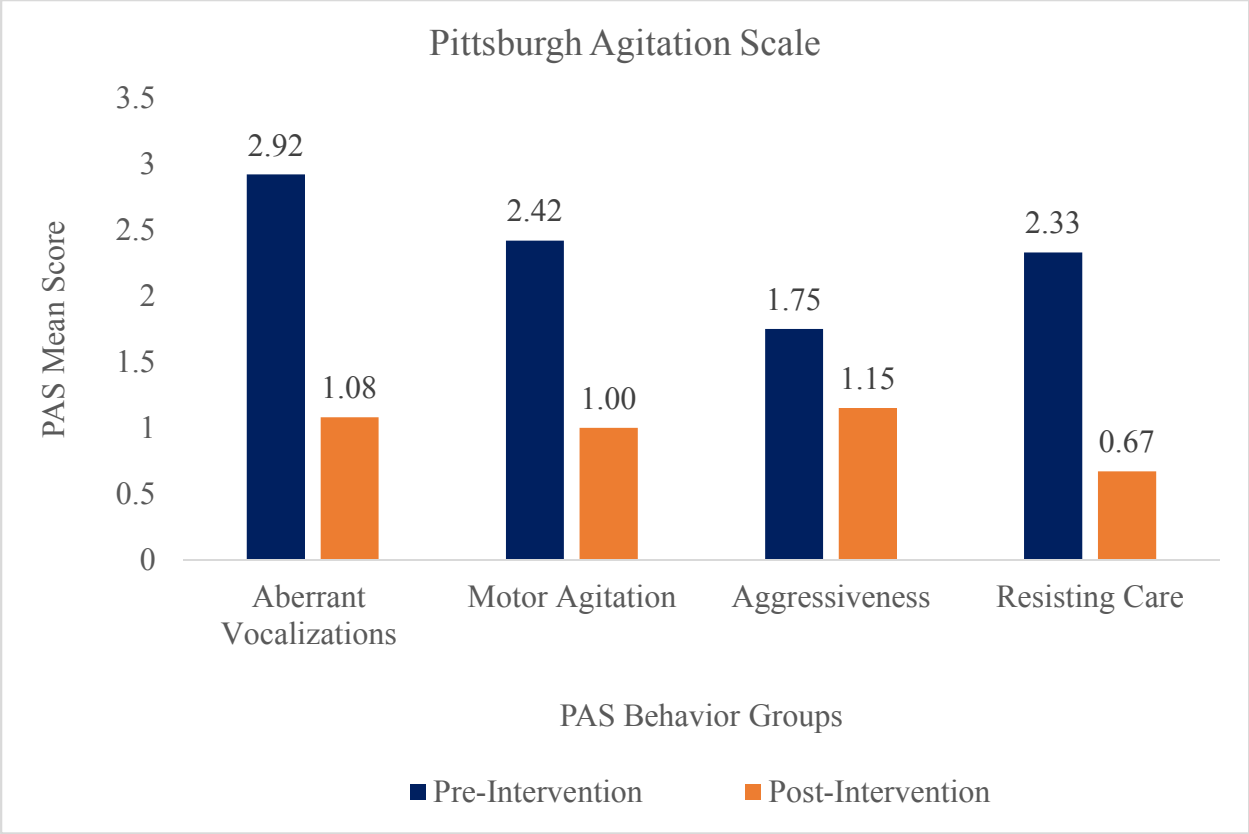


Figure 1. Mean PAS scores by behavior group at pre-and-post intervention throughout the implementation period, September 2020 to November 2020.

The measurement process also evaluated the use of PRN medications and deprescribing to determine a trend. As such, the evaluation reviewed resident charts 6-months before the implementation and during the 3-month implementation itself. Among the residents who participated in the project, no PRN medications were used or medications deprescribed. Thus, there was no change in the use of PRN medications or instances of deprescribing.

Discussion

The aim of this project was to evaluate the impact of an evidence-based nonpharmacological intervention to treat dementia-related agitation. Results indicated a significant decrease in agitation severity after passive music therapy was utilized. Results are as predicted and consistent with the growing body of evidence. Although the results

are promising and demonstrate an impact on agitation severity, several limitations of this project prevent generalization to a broader patient population.

Strengths

During the COVID-19 pandemic, the MCU DON was asked to play an active and engaged role throughout all phases of the project including promoting staff buy-in, coordinating with staff, facilitating participation, and providing oversight to ensure results were obtained in an organized and consistent manner. The MCU staff's ongoing cooperation, commitment, and dedication were instrumental to the project's success. The MCU staff participated in a case study exercise presented during the educational training sessions, and an agreement on PAS scoring was decided as a result. The PAS measurement tool's ease and convenience was another notable strength of this project, which appealed to the MCU staff's self-interest and did not significantly interfere with busy work schedules. Similarly, having each resident's music choices stored on the music playing devices increased staff efficiency. Lastly, resources required for implementation were provided by the facility, and the low cost to fund the project was a considerable advantage.

Limitations & Barriers

There were several limitations identified in this project. The design of this project is quality improvement and lacks experimental components such as randomization, replication, and control. Therefore, this project cannot establish a cause-and-effect relationship between the use of passive music therapy and agitation levels. Moreover, this project was susceptible to bias and extraneous variables, such as PAS scores being influenced by MCU staff who knew the project's intended outcomes. Thus, this introduces the potential of skewed results, as well as

agitation being impacted by factors other than the intervention itself.

The small sample size ($n = 4$) of this project was another significant limitation. Due to the small sample size, the results do not possess a high degree of generalizability. In addition, the sample lacks heterogeneity, as all residents who participated were female. As such, the effect that passive music therapy will have on larger patient populations in long-term care cannot be concluded.

A major barrier to the success of the project was the COVID-19 pandemic. As a result of the global pandemic, this DNP student's access to the project facility was restricted during the early phases of implementation. Due to infection control policies, educational training sessions had to be moved to a virtual online platform rather than performed in-person. Using a virtual online platform as the primary medium for the educational training sessions could have negatively impacted the engagement between this DNP student and MCU staff. The chance to interact with MCU staff on an individual basis was limited, and MCU staff could have been less compelled to participate as a result. Extenuating circumstances created by the COVID-19 pandemic likely played a factor in not meeting the educational goals set forth in this project.

Implications & Sustainability

For future projects, recommendations include lengthening the implementation period to 12-months to increase the sample size. With a larger, diverse sample, it will be possible to make inferences regarding the effect on the broader population. Moreover, future projects should consider moving all educational training sessions to an in-person format. By performing educational training sessions in-person and forming interpersonal relationships, staff are more likely to be receptive to the practice change and participate throughout all phases of the project. Additionally, the project could be improved by including medical providers in the educational

training sessions. Including the resident's providers in the educational training sessions will facilitate care coordination and the deprescribing process. Further studies are needed to establish the intervention's optimal duration, which is another area of exploration for future projects.

Sustaining the practice change at Kalakaua Gardens is feasible due to the project's negligible implementations costs and organizational commitment. Throughout the project, it became clear the organization had a vested interest in the success of the project.

Recommendations to improve sustainability efforts include securing additional funding to purchase more music playing devices and headphones, thereby increasing the number of residents who can participate at a given time. Furthermore, Kalakaua Gardens would benefit by developing a training program tailored toward the use of nonpharmacological interventions for all new and existing staff.

Conclusion

The intent of this project was to reduce the severity of dementia-related agitation in long-term care by utilizing an evidence-based nonpharmacological intervention. This project demonstrated that passive music therapy had a positive and almost immediate impact on all those who participated. Thus, the results suggest passive music therapy is beneficial for the management of dementia-related agitation. The results are promising and offer a measure of hope for all those with dementia; however, additional studies are warranted as the results are preliminary and limited in scope.

The American Association College of Nursing developed *The Essentials of Doctoral Education for Advanced Nursing Practice* (2006) outlining eight foundational competencies that are core to the role of advanced practice nurses. Appendix G describes how this EBP project achieved each of the competencies.

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<https://doi.org/10.1016/j.jamda.2017.12.009>

Ueda, T., Suzukamo, Y., Sato, M., & Izumi, S. (2013). Effects of music therapy on behavioral and psychological symptoms of dementia: A systematic review and meta-analysis. *Ageing Research Reviews*, 12(2), 628–641. <https://doi.org/10.1016/j.arr.2013.02.0>

Appendix A

Table 1

Literature Matrix Table

Author	Purpose	Findings	Conclusion	Level of Evidence	APA Citation
Blackburn et al.	To identify if music therapy is a beneficial therapy for use with dementia patients.	The six studies reviewed show small positive effects of music therapy on reducing anxiety, depression, and agitated behaviors displayed by elderly individuals with dementia.	The studies show promising results, but further research is warranted due to methodological weaknesses.	Other: Literature review	Blackburn, R., & Bradshaw, T. (2014). Music therapy for service users with dementia: a critical review of the literature. <i>Journal of Psychiatric and Mental Health Nursing</i> , 21(10), 879–888. https://doi.org/10.1111/jpm.12165
Huber et al.	To investigate the impact of a music-based intervention on depression, agitation, and positive emotions	Depression scores decreased significantly over time while agitation behavior showed a constant moderate level without any significant decreases. Positive emotions occurred significantly more often than negative emotions during the music listening. Individualized music listening induced positive emotions and reduced depression scores over time.	Music intervention can be recommended not only as a helpful means for triggering positive emotions and memories and for reducing depressive symptoms in persons with dementia (PWD), but also as an important tool for caregivers to emotionally connect with PWD and to disburden their everyday work.	Level III: Controlled crossover design	Huber, A., Oppikofer, S., Meister, L., Langensteiner, F., Meier, N., & Seifert, A. (2020). Music & memory: The impact of individualized music listening on depression, agitation, and positive emotions in persons with dementia. <i>Activities, Adaptation & Aging. Advance online publication</i> . https://doi-org.eres.library.manoa.hawaii.edu/10.1080/01924788.2020.1722348
Jutkowitz et al.	To evaluate the efficacy of nonpharmacological care-delivery interventions to reduce and manage agitation and	Strength of evidence was generally insufficient to draw conclusions regarding efficacy or comparative effectiveness.	Evidence was insufficient regarding the efficacy of nonpharmacological care-delivery interventions to reduce agitation or aggression in nursing home and assisted living facility residents with dementia.	Level I: Systematic review & meta-analysis	Jutkowitz, E., Brasure, M., Fuchs, E., Shippee, T., Kane, R. A., Fink, H. A., ... Kane, R. L. (2016). Care-delivery interventions to manage agitation and aggression in dementia nursing home and assisted living residents: A systematic review and meta-analysis. <i>Journal of the</i>

	aggression in nursing home and assisted living residents				<i>American Geriatrics Society</i> , 64(3), 477–488. https://doi.org/10.1111/jgs.13936
Kaneshiro, L.K	To use evidenced-base nonpharmacological interventions to reduce the severity of agitated behaviors	During a 3-month implementation period, 100 episodes of agitation were addressed using music and activity and evaluated using the PAS. On average, data analysis showed a decrease in agitation severity for all four behavioral groups after music and activity intervention was utilized A decrease in agitation severity was observed for the majority of episodes, 62 of 100, documented.	The project results indicated that agitated patients benefit from nonpharmacologic interventions of music and activity. The results suggested that music and activity intervention was successful at reducing the severity of agitated behaviors and preventing the onset of agitated behaviors in patients that have presented with difficult behaviors in prior shifts	Other: Quality improvement	Kaneshiro, L. K. (2018). <i>Implementation of activity and music on agitation management in hospitalized adults on a medical-surgical unit</i> (Doctoral dissertation, University of Hawaii at Manoa). Retrieved from https://scholarspace.manoa.hawaii.edu/bitstream/10125/62627/2018-05-dnp-kaneshiro.pdf
Livingston et al.	This study aimed to discover which non-drug approaches to agitation in dementia worked, for whom and in what setting, whether or not they work immediately and in the longer term, and whether or not they represent good value for money.	Agitation decreased when care home residents carried out pleasant activities, or sensory intervention or structured music therapy.	Activities and structured music therapy helped to decrease the level of agitation in care homes but was not specifically tested in severe agitation. Recommendations include using a manual with managers and staff of care homes to ensure the permanent and consistent implementation of effective interventions.	Level I: Systematic review	Livingston, G., Kelly, L., Lewis-Holmes, E., Baio, G., Morris, S., Patel, N., ... Livingston, G. (2014). A systematic review of the clinical effectiveness and cost-effectiveness of sensory, psychological and behavioural interventions for managing agitation in older adults with dementia. <i>Health Technology Assessment</i> (Winchester, England), 18(39), 1–226. https://doi.org/10.3310/hta18390

<p>Mileski et al.</p>	<p>To investigate the applicability and effectiveness of the use of music in providing for positive physical and mental outcomes in nursing facilities</p>	<p>The most common facilitator mentioned was increased socialization or communication (18%), followed by reduced depression (12%), improved physical health (11%), and reduced agitation or behavior problems (9%). The most common barriers were as follows: cannot isolate effects of music (26%), cost prohibitive (11%), difficult to implement (11%), and no significant improvements in QOL or well-being (11%).</p>	<p>The use of music showed positive outcomes for residents in nursing facilities and should be considered for implementation as part of the normal culture within such facilities.</p>	<p>Level I: Systematic review</p>	<p>Mileski, M., Brooks, M., Kirsch, A., Lee, F., Levieux, A., & Ruiz, A. (2019). Positive physical and mental outcomes for residents in nursing facilities using music: a systematic review. <i>Clinical Interventions in Aging</i>, 14, 301–319. https://doi.org/10.2147/CIA.S189486</p>
<p>Millan-Calenti et al.</p>	<p>To review the literature on nonpharmacological therapies used to manage agitation in older AD patients over the past 20 years and assess the specific effectiveness of each nonpharmacological therapy</p>	<p>Three studies provided evidence of the effectiveness of music therapy for reducing agitation in institutionalized patients with moderately severe and severe AD. This result was particularly strong when the intervention included individualized (related to special positive memories of the participants) and interactive (including clapping, singing, and dancing) music.</p>	<p>Music therapy is an effective nonpharmacological intervention for reducing agitation in institutionalized AD patients, particularly when the intervention implies individualized and interactive music. However, more evidence regarding the long-term effects of this therapy is needed. In general, there is a severe paucity of research into the effects of nonpharmacological therapies in managing agitation in older AD patients</p>	<p>Level I: Systematic review</p>	<p>Millan-Calenti, Jose Carlos et al. Optimal Nonpharmacological Management of Agitation in Alzheimer’s Disease: Challenges and Solutions. <i>Clinical Interventions in Aging</i> 11 (2016): n. pag. Web.</p>

Oliveira et al.	To investigate the response of patients presenting diverse symptoms of behavioral and psychological symptoms (BPSD) to different nonpharmacological approaches.	Four studies were found regarding the impact of music therapy, using different interventions, and each revealed positive effects.	Most studies have demonstrated that these interventions have important and significant efficacy improving BPSD such as agitation, psychotic symptoms, and apathy.	Level I: Systematic review	Oliveria, A. M., Radanovic, M., De Mello, P. C. H., Buchain, P. C., Vizzotto, A. D. B., Celestino, D. L., ... & Forlenza, O. V. (2015). Nonpharmacologic interventions to reduce behavioral and psychological symptoms of dementia: A systematic review. <i>BioMed Research International</i> , 2015. https://www.hindawi.com/journals/bmri/2015/218980/
Pedersen et al.	To investigate whether music therapy is an effective intervention for reducing agitated behaviors in dementia.	Music intervention (MI) significantly reduces agitated behaviors in demented individuals. Both personalized and group intervention showed comparable substantial effect sizes. Individual MI showed tangentially higher effects than MI applied in groups, but much larger variations of these effects. Active and passive interventions yielded nearly identical effect sizes.	This meta-analysis is the first systematic and quantitative overview supporting clinically and statistically robust effects of music intervention on agitation in dementia.	Level I: Meta-analysis	Pedersen, S., Andersen, P., Lugo, R., Andreassen, M., Sütterlin, S., & Pedersen, S. (2017). Effects of Music on Agitation in Dementia: A Meta-Analysis. <i>Frontiers in Psychology</i> , 8(MAY), 742–742. https://doi.org/10.3389/fpsyg.2017.00742
Sarkamo et al.	To determine the efficacy of a novel music intervention based on coaching caregivers of persons with dementia (PWD) to use either singing or music listening.	Regular musical activities were effective in temporarily improving mood, whereas only music listening improved QOL in the long run. Compared with usual care, both singing and music listening were found to maintain or enhance general cognition, orientation, attention and executive function, and remote personal episodic memory of the PWDs, as well as to improve their mood	From a clinical standpoint, the findings are promising as they encourage the use of singing and music listening as beneficial leisure activities for both PWDs and their caregivers.	Level II: Randomized controlled study	Särkämö, T., Tervaniemi, M., Laitinen, S., Numminen, A., Kurki, M., Johnson, J., & Rantanen, P. (2014). Cognitive, Emotional, and Social Benefits of Regular Musical Activities in Early Dementia: Randomized Controlled Study. <i>The Gerontologist</i> , 54(4), 634–650. https://doi.org/10.1093/geront/gnt100

Seitz et al.	To systematically review the evidence for nonpharmacological interventions for neuropsychiatric symptoms (NPS) in LTC, and to assess both the quality of studies and the feasibility of interventions.	A total of 40 studies met inclusion criteria. Sixteen (40%) of 40 included studies reported statistically significant results in favor of nonpharmacological interventions on at least one measure of neuropsychiatric symptoms (NPS) of dementia in long-term care (LTC).	There are several nonpharmacological interventions that may be effective for NPS in LTC, although there are a limited number of large-scale, high-quality studies in this area. The feasibility of some interventions will be limited in many LTC settings and further research into practical and sustainable interventions for NPS in LTC is required to improve usage of these important treatments.	Level I: Systematic review	Seitz, D. P., Brisbin, S., Herrmann, N., Rapoport, M. J., Wilson, K., Gill, S. S., ... Conn, D. (2012). Efficacy and feasibility of nonpharmacological interventions for neuropsychiatric symptoms of dementia in long term care: A systematic review. <i>Journal of the American Medical Directors Association</i> , 13(6), 503-506, doi: 10.1016/jamda.2011.12.059
Tsoi et al.	To evaluate the effects on cognitive functions and behavioral symptoms between interactive and receptive music therapies for people with dementia.	In sensitivity analyses, receptive music therapy also showed statistically significant reduction in anxiety, agitation, and behavioral problems for older people with dementia. The study shows receptive music therapy has a better effect in alleviating anxiety, agitation, and behavioral problems than interactive music therapy	This meta-analysis illustrates that receptive music therapy can reduce agitation, behavioral problems, and anxiety symptoms in older adults with dementia, and appears to be better than interactive music therapy. The optimal frequency and duration of intervention require further investigation to determine the most effective method to conduct receptive music therapy.	Level I: Systematic review & meta-analysis	Tsoi, K., Chan, J., Ng, Y., Lee, M., Kwok, T., & Wong, S. (2018). Receptive Music Therapy Is More Effective than Interactive Music Therapy to Relieve Behavioral and Psychological Symptoms of Dementia: A Systematic Review and Meta-Analysis. <i>Journal of the American Medical Directors Association</i> , 19(7), 568–576.e3. https://doi.org/10.1016/j.jamda.2017.12.009
Ueda et al.	To evaluate the efficacy of music therapy on behavioral and psychological symptoms of dementia (BPSD).	Music therapy had moderate effects on anxiety and small effects on behavioral symptoms. Interventions greater than 3 months strongly decreased anxiety.	The present systematic review and meta-analysis suggests that music therapy is effective for the management of BPSD.	Level I: Systematic review & meta-analysis	Ueda, T., Suzukamo, Y., Sato, M., & Izumi, S. (2013). Effects of music therapy on behavioral and psychological symptoms of dementia: A systematic review and meta-analysis. <i>Ageing Research Reviews</i> , 12(2), 628–641. https://doi.org/10.1016/j.arr.2013.02.003

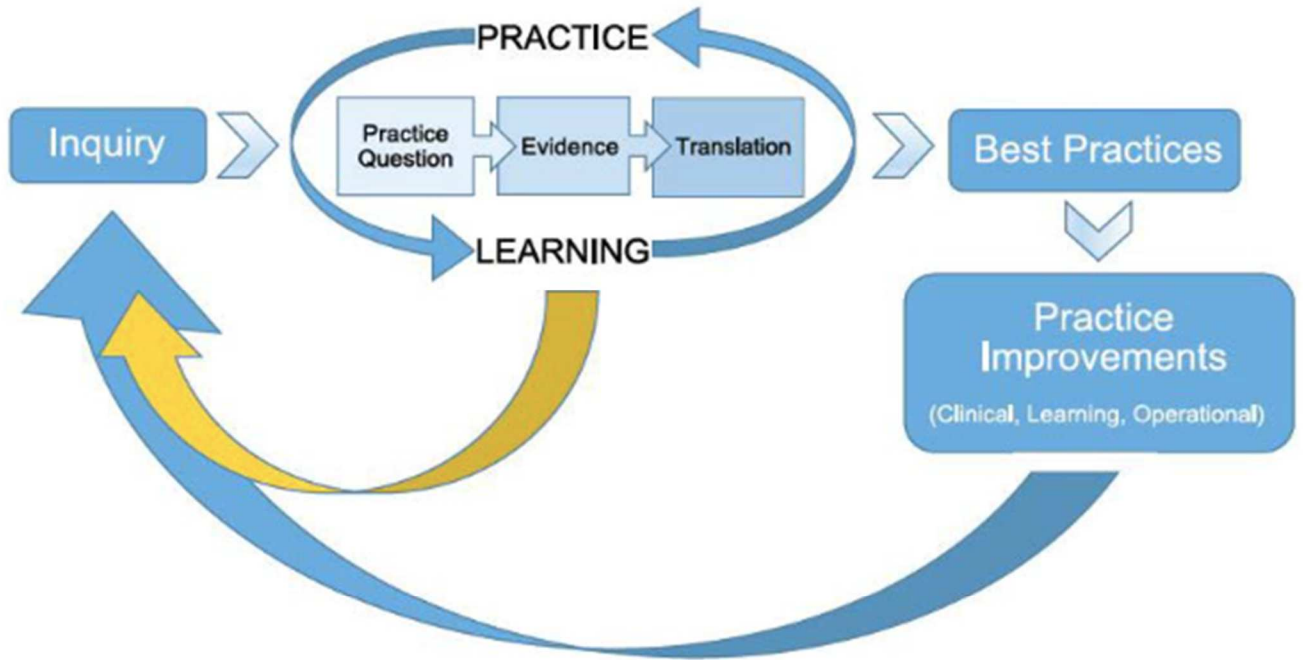
Appendix B

Table 2

Project Timeline

Sub-Tasks	Responsible Person	Due Date	Comments
Major Task #1: Provide educational training to 100% of MCU staff.			
Create content for educational training session	DNP student	6/15/20 – 7/15/20	
Present educational training to DON for feedback and approval	DNP student, DON, content expert	7/15/20 – 7/31/20	
Distribute flyers announcing dates/times of training sessions	DNP student	7/15/20 - 7/31/20	
Present educational training to MCU staff to include: MAs, NAs, DON	DNP, DON, Staff	8/1/20 – 8/31/20	Training will be offered on two different days
Major Task #2: Implement practice change. Target 100% of agitated MCU residents for passive music therapy.			
Distribute Pittsburgh Agitation Scale (PAS) surveys to staff	DNP student	9/1/20 – 11/30/20	
Provide access to music streaming services	DNP student	9/1/20 – 11/30/20	
Observe application of music therapy and completion of PAS. Distribute and administer as necessary. Provide feedback for staff when necessary	DNP student, DON, staff	9/1/20 – 11/30/20	Data will be collected by DNP student and staff
Assess resident and staff interaction	DNP student	9/1/20 – 11/30/20	
Evaluate staff's perception of intervention's effectiveness	DNP, DON, staff	9/1/20 – 11/30/20	
Major Task #3: Analyze data. Assess for a reduction in agitation severity.			
Compile, average, and analyze PAS scores	DNP student, DON	12/01/20 – 12/31/20	
Finalize data collection	DNP student	12/01/20 - 12/31/20	

Appendix C



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Pittsburgh Agitation Scale

Patient's Name: _____ Rater's Name: _____

Patient #: ____ Date: ____ Time: ____ AM/PM to ____ AM/PM

Hours of sleep this rating period _____

Circle only the highest intensity score for each behavior group that you observed during this rating period. Use the anchor points as a guide to choose a suitable level of severity. (Not all anchor points need be present. Choose the more severe level when in doubt.)

Behavior Groups

Intensity During Rating Period

Aberrant Vocalization

(repetitive requests or complaints, nonverbal vocalizations, e.g., moaning, screaming)

0. Not present
1. Low volume, not disruptive in milieu, including crying
2. Louder than conversational, mildly disruptive, redirectable
3. Loud, disruptive, difficult to redirect
4. Extremely loud screaming or yelling, highly disruptive, unable to redirect

Motor Agitation

(pacing, wandering, moving in chair, picking at objects, disrobing, banging on chair, taking others' possessions. Rate "intrusiveness" by normal social standards, not by effect on other patients in milieu. If "intrusive" or "disruptive" due to noise, rate under "Vocalization.")

0. Not present
1. Pacing or moving about in chair at normal rate (appears to be seeking comfort, looking for spouse, purposeless movements)
2. Increased rate of movements, mildly intrusive, easily redirectable
3. Rapid movements, moderately intrusive or disruptive, difficult to redirect
4. Intense movements extremely intrusive or disruptive, not redirectable verbally

Aggressiveness

(score "0" if aggressive *only* when resisting care)

0. Not present
1. Verbal threats
2. Threatening gestures; no attempt to strike
3. Physical toward property
4. Physical toward self or others

Resisting Care

(circle associated activity)

Washing

Dressing

Eating

Meds

Other _____

0. Not present
1. Procrastination or avoidance
2. Verbal/gesture of refusal
3. Pushing away to avoid task
4. Striking out at caregiver

Were any of the following used during this rating period because of behavior problems? (Circle interventions used.)

Seclusion

PRN Meds (specify)

Restraint

Other interventions _____

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Appendix E

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July 19, 2020

Music Preferences

*“Music gives a soul
to the universe,
wings to the mind,
flight to the
imagination and
life to everything.”*

- Plato.

Aloha,

Kalakaua Gardens is committed to excellence in memory care. We pride ourselves on taking an individualized approach to meeting the unique needs of our residents. Our goal is to offer programs and activities that are tailored to the preferences and interests of residents. One activity we are focusing on in particular is music. We believe that music is another way to meaningfully connect with our residents and help enrich their lives. Please help by identifying the musical choices that residents prefer by indicating below and returning at your earliest convenience. Thanks for your time and cooperation!

Resident's Name: _____

Music Preferences:

- ***Favorite Genre:*** _____
- ***Favorite Time Period:*** _____
- ***Favorite Bands:*** _____
- ***Favorite Musicians:*** _____

Appendix G

Table 3

DNP Essentials Criteria

Essential	Description	Connection to EBP Project
I.	Scientific Underpinnings for Practice	<ul style="list-style-type: none"> • Integrated science-based theories involving music to enhance the quality of care for residents with dementia in long-term care • Developed and evaluated a new practice change by utilizing the most current literature and scientific findings related to nursing and health care
II.	Organizational and Systems Leadership	<ul style="list-style-type: none"> • Fostered collaboration of care • Trained and educated nursing staff to promote quality improvement • Developed and maintained a budget to ensure the project is sustainable
III.	Clinical Scholarship and Analytical Methods for EBP	<ul style="list-style-type: none"> • Critically appraised and evaluated current literature to establish best practices • Designed and implemented processes to effectively measure project outcomes and trends
IV.	Information Systems and Technology	<ul style="list-style-type: none"> • Executed an evaluation plan involving the extraction of resident information through an EMR database at the project facility • Maintained resident privacy during database extraction
V.	Health Care Policy for Advocacy in Health Care	<ul style="list-style-type: none"> • Consulted current clinical guidelines to educate nursing staff of an effective and safe practice change
VI.	Interprofessional Collaboration	<ul style="list-style-type: none"> • Used effective communication and leadership skills to facilitate collaboration between stakeholders and nursing staff
VII.	Clinical Prevention and Population Health	<ul style="list-style-type: none"> • Designed, implemented, and evaluated a DNP project to improve health outcomes in agitated residents with dementia in long-term care
VIII.	Advanced Nursing Practice	<ul style="list-style-type: none"> • Designed, implemented, and evaluated an EBP project utilizing best practices to improve health outcomes