

Dementia and Non-Pharmacological Interventions: Comparing Different Interventions and Agitation Levels

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ABSTRACT

Agitation is one of the most prevalent symptoms among Dementia patients. To conclude which type of intervention eases agitation most efficiently, art-centered interventions and music-centered interventions were conducted and observed. Behaviors observed during musical interventions included patient participation, singing, and dancing while behaviors observed during art-centered interventions included bonding over complaints. To ensure accuracy, the observed results are compared with scores on the Quality of Life Scale. Both results show Dementia patients favor music, decreasing the amount of agitation displayed.

Introduction

Dementia is one of the most common causes of death amongst seniors in the United States and the United Kingdom. It is a condition that affects and touches the hearts of many families per year. Each case of Dementia is fatal due to the lack of a cure. As the dementia patient slowly loses cognitive function, they become more dependent on others while developing significant symptoms that not only affect them but also affect those who they become dependent on.

The overarching goal of this study is to identify a difference in agitation levels between dementia patients before and after art-centered activities compared to before and after music-centered activities. The hope is to give caretakers a better idea of which method to utilize if they can sense an upcoming period of agitation in their loved ones. This is crucial because it will give caregivers a sense of understanding when it comes to their loved one's symptoms that they may not have had before and how to help them calm down without medications.

Literature Review

Dementia and Agitation

Dementia is a progressive condition that declines memory and cognitive function in the brain. Along with memory decline and the loss of cognitive function, dementia also has many behavioral and psychological symptoms. Writers from the British Medical Journal, Helen Kales, Laura Gitlin, and Constantine Lyketsos, mention that those with dementia can be expected to display “agitation, depression, apathy, repetitive questioning, psychosis, aggression, sleep problems, wandering, and a variety of inappropriate behaviors”(Kales, H., Gitlin, L., & Lyketsos, C.,2015). Some of these symptoms will have more of an effect on the patient than the others, but almost all dementia patients display one of these symptoms throughout their decline.

Due to these symptoms and the decline that is associated with dementia, the diagnosed rely more and more heavily on their caretaker as the condition runs its course. The extensive care that dementia patients require

affects their agitation symptoms. As their memory declines and their caregiver is no longer familiar to them, dementia patients can become physically and verbally combative. These neuropsychiatric symptoms, “are strongly associated with stress and depression in caregivers”(Kales, Gitlin, Lyketsos, 2015).

There is no way to directly relieve agitation, but there are two intervention paths that are commonly taken to help ease it, pharmacological and nonpharmacological interventions. A pharmacological intervention includes the use of drugs and medicine to, “improve symptoms or delay the progression of dementia syndromes”(Santaguida, Raina, Booker, etc., 2004). Pharmacotherapy is the most common and central intervention to ease the behavioral symptoms of dementia, non-pharmacotherapies can also be implemented. Non-pharmacological pursuits can be classified as any interventions that do not involve the use of medicine. The two most common types of non-pharmacotherapies are art therapies and music therapies.

Art Therapy in Dementia Patients

Researchers have come to a wide conclusion that art-related therapies can be used to help relieve agitation in those with dementia, but are not effective in all cases. According to the British Association of Art Therapists, art therapy can be defined as, “a form of psychotherapy that uses art media as its primary mode of communication.”(BAAT). Art therapies are generally used, “interventions [to] manag[e] manifestations of dementia, as they may help to slow cognitive deterioration, address symptoms related to psychosocially challenging behaviors and improve quality of life”(Deshmukh, Holmes, Cardno, 2018). Although the studies utilize varying methodologies, the results seen and measured in the participants can be easily compared. Art therapy can be classified into, “three major approaches... visual art, music and dance”(Schneider, 2018). Each art approach allows the artist to express themselves in different ways. Dance allows the artist to convey their art in the form of movement and, “the use of color is an immediate, non-verbal way to express inner thoughts, feelings, and emotions when words are lacking”(Savazzi, Isernia, Farina, etc., 2020).

In a series of randomized control trials, conducted by Cochrane Dementia and Cognitive Improvement Group’s Specialized Register, done throughout 2014-2017, participants were reviewed and observed based on, “scales measuring cognition, affect and emotional well-being, social functioning, behavior, and quality of life”(Deshmukh, Holmes, Cardno, 2018). Two of the studies were further reviewed by authors based on their similar use of the Grading of Recommendations Assessment, Development and Evaluation (GRADE) rating scale. The GRADE scale is used to, “rate the quality of scientific evidence in systematic reviews and to develop recommendations in guidelines that are as evidence-based as possible”(Dijkers, 2013).

The first control trial consisted of twelve-week, forty-five-minute sessions that included five participants. These participants would focus on coloring with either crayons or watercolor paint. The participants had the option to free draw or use color line drawings of familiar items. Throughout these group meetings, the participants were accompanied by family members. The second control trial that qualified for observation went on for forty weeks, meeting once a week for one-hour sessions with up to six participants. This trial lacked the use of any strict activities as the participants were allowed to create any art under the supervision of the art therapist. Based on the GRADE scale, there was little to no difference in the quality of life after both of these interventions. The little changes that occurred throughout the trials did turn out to be positive but were not significant enough for the author to conclude that art therapy affects dementia patients. The authors also concluded that the insufficient amount of evidence may have had an impact on their ratings.

Another case study focused particularly on an Art, Colors and Emotions treatment (ACE-T) and its effects on quality of life, behavior, and cognition on people with Alzheimer’s disease (PWAD) at the Memory Clinic of Don Gnocchi Foundation. The ACE-T is described as “a novel multi-dimensional visual art intervention for people with Alzheimer’s disease” (Savazzi, Isernia, Farina, etc., 2020). The participants were put into mixed-sex groups of six to eight members that would meet for two hours a week, twice a week, for seven weeks. The ACE-T was delivered by an experienced art treatment psychologist and a rehabilitation therapist who had

prior experience at the Memory Clinic. The participants would go through 14 sessions aimed at affecting patients in different areas (cognition, behavior, and communication), in line with a holistic approach” (Savazzi, Isernia, Farina, etc., 2020). To create activities from a cognitive standpoint, the participants would name objects and materials, recall popular pieces of art, mix tempura paints to create new colors, describing their photo, or drawing and coloring a childhood place. The goal behind the behavioral approach of the ACE-T was to reduce agitation by having the patients recall and recognize the materials and prior art projects. After the sessions, the authors rated the participants on multiple scales and compared the results with a primary and secondary system.

The ACE-T improved the participants’ quality of life, reduced behavioral symptoms, and had positive effects on cognitive function. The ACE-T is hypothesized to be more successful due to its intensiveness. Looking at art therapies in general, “intensive rehabilitation approach[s], such as ACE-T, should have a higher efficacy on the quality of life dimension than the one with fewer weekly sessions” (Savazzi, Isernia, Farina, etc., 2020). This may be why the two different controlled art trials and the ACE-T had noticeably different results. The controlled trials only met weekly for a shorter period, while the treatment met more frequently for longer periods.

Music Therapy in Dementia Patients

The differentiating factor between the science behind music and art therapy is the networks of the brain each therapy interacts with. Unlike visual arts, such as painting and crafts, “musical memory networks are separate from traditional temporal lobe memory networks” (Leggieri, Thaut, Fornazzari). Studies have not only shown that music can help improve depression symptoms in those with dementia but according to the Menorah Center for Nursing and Rehabilitation in Brooklyn, New York, “a music intervention led by certified nursing assistants (CNAs) trained by music therapists to address depression symptoms and wellbeing in individuals with dementia” (Ray, Götell, 2018). Although the caretakers are not directly experiencing the memory loss themselves, watching and caring for their loved one “becomes increasingly burden[ing] physically and emotionally” (Rio, 2018). After dementia patients engage in music therapy, research has found that it, “reduce[s] agitation, reduce[s] Behavioral and Psychological Symptoms of dementia (BPSD) and decrease[s] anxiety and depression” and with “improv[ing] mood by singing and listening” (Rio, 2018). Although lyrics can “stimulat[e] language and memories,” instrumental music can also produce results (Rio, 2018).

In a pilot study described in the *Australian Nursing & Midwifery Journal*, BPSD was decreased through the use of Tibetan Singing Bowl Therapy (TSBT). After one month, a “50% reduction was observed amongst resident participants” was reported (Bulsara, Seaman, Steuxner, 2016). The TSBT saw a decrease in physically non-aggressive behaviors but the study did not mention any changes in cognitive function. Music with lyrics can also show changes in BPSD. While participants in a study, conducted by Andrew Sixsmith and Grant Gibson from Cambridge University, were interviewed, even the mention of music caused the participants to become “visibly brightened, smile or laugh, and in several cases beg[in] to sing” (Sixsmith, Gibson, 2006). Music can cause a decrease in BPSD that researchers, along with caretakers, can recognize. Raymond, the husband of a dementia patient, can see that music, “seems to calm [his wife] down and she enjoys saying familiar things, singing familiar hymns” (Sixsmith, Gibson, 2006). The familiarity brought to those with dementia from music can be related to an increased cognitive function during the short period where music is being played. In a systematic review and meta-analysis conducted by researchers from the University of Castilla-La Mancha in Toledo and Albacete, Spain, there was a clear relationship between lyrical music and cognitive function that it can be hypothesized that, “music improves cognitive function” (Bulsara, Seaman, Steuxner, 2016). While the lyrics and instrumentals can improve cognitive function and BPSD along with the “quality of life of people with dementia once the intervention is finished, but it does not have a long-lasting effect” (Moreno-Morales, Calero, Pintado, 2020).

Methods

Identification of Gap

After a deep dive into the literature surrounding dementia, one of the most discussed topics was the symptoms that came along with the cognitive decline. Many of the symptoms that arise the most talk in the community of dementia were along the lines of depression and anxiety. These topics had many more papers compared to symptoms such as apathy, agitation, confusion, and wondering. Out of those few symptoms, agitation had the most background research. This was crucial for finding a gap since the other symptoms did not have as much research or talk surrounding them. Although it would be easier to find a gap under those symptoms, there was not enough literature to understand them enough to create further questioning.

Agitation provided literature from the behaviors of agitated patients, to how it could be soothed. While there are countless numbers of ways to help decrease agitated behaviors, there was no clear answer to which method would be the most effective and efficient. This is where the gap between interventions was identified. From there, the two interventions that produced similar results were art and music-based interventions since they interact with the same side of the brain. There has been no prior research directly comparing the two, hence bringing up the question “Which Intervention is More Effective at Reducing Agitation Levels in Dementia Patients; Art or Music?”

Study Design Overview

To get the best understanding, qualitative data will be collected and analyzed along with a content analysis based on the Quality of Life - Alzheimer’s Disease (QOL-AD) scale. The QOL-AD is typically filled out by caregivers and is an “assessment of physical health, mental health, social and financial domains and an overall [quality of life] rating”(Hoe, Katona, Roch, et.al, 2004). Observations from before and after activities will be analyzed and compared. Qualitative data will be graphed and analyzed from four different studies to compare the different levels of agitation based on the QOL-AD results. By comparing qualitative and quantitative data, it is possible to draw conclusions based on the similarities in data.

Limitations

The initial research methodology was built around the idea of collecting qualitative, along with quantitative data. Participants in the study would be observed, while also being rated on the Pittsburgh Agitation Scale (PAS) which can be described as, “an easy-to-use instrument, based on direct observations of the patient, that was developed to monitor the severity of agitation associated with dementia”(Rosen, Burgio, Kollar, et. all, 1994). The original idea was to directly observe the patients before and after they experienced music and art, but with the ongoing COVID-19 pandemic, that was not able to happen as often as the study required.

Ideally, the patients would be observed during art and music time every day for two weeks and rated on the PAS. This would act as the quantitative data, and the scale results would be graphed and compared over the two weeks. With a majority of the participants being at high risk for getting COVID-19, it was not practical to visit every day. Due to this, the PAS was scrapped from the methodology and the observational took a bigger role. To replace the quantitative data, a content analysis was put in its place.

Search Strategies and Criteria

To conduct an efficient context analysis, appropriate pieces of literature had to be collected. Starting with a wider search, online databases such as Frontiers, Cochrane Library, SciELO, Gale, and PubMed were searched. To find studies best fitted for comparison, a strategy of keywords was developed and searched. The independent content analysis underwent the review process detailed below.

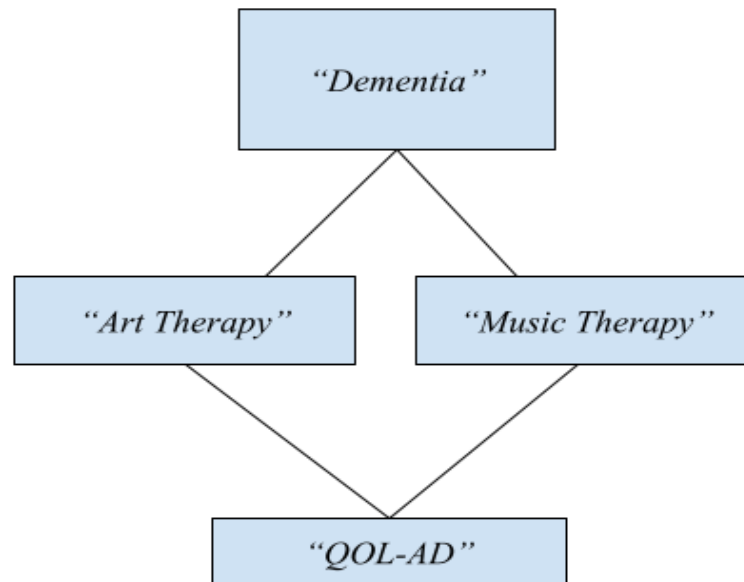


Figure 1. Review Process for Final Comparison Studies

The consistent keyword “dementia” was included in all searches across the databases. To narrow down specific studies to compare, to find art-related trials, the words “art therapy” were included in the search. To collect music-related trials, the words “music therapy” were added. For the data from the previous studies to be compared, the data has to be organized on the same scale. To ensure the data was comparable, the term “QOL-AD” was later added to the end of both music and art-related searches. All studies chosen incorporated different types of activities under the realm of art and music and had differing participants. Each had participants of different ages and stages of dementia along with both genders. Having diversity amongst the studies contributes to diverse data, which allows results to be varied and applied to a larger variety of situations.

Data Collection and Criteria

To provide the most authentic and accurate observations, qualitative information is collected from an adult daycare in Massachusetts Norfolk County. The adult social center specializes in older adults with cognitive impairment, especially dementia and Alzheimer's disease. Before reaching out to the adult daycare, the research method was looked over and approved by an IRB to ensure the research methods were ethical. This IRB was approved by the Health and Human Resource Department. The caretakers of the guests signed a consent form (Appendix A) allowing their loved ones to anonymously participate in the study. Six consent forms were returned and each participant showed notably observed behaviors. As the guests participated in either activity surrounding art or music, their actions and conversations were observed. The guests’ body language and tones before, during, and after the activities were particularly taken into consideration.

Along with qualitative data, quantitative was also analyzed from six previously conducted studies. Three of the studies were music-based while the others were arts-based. Each study included qualitative data collected based on ratings from the QOL-AD (Appendix B). This allowed for the data results to be placed on a chart to be easily compared. Once the data was charted, it was ready to be analyzed and conclusions were drawn. Based on that conclusion the research was summed with a general finding.

Results

Quantitative Results

The studies chosen centered around their main type of interventional therapies. The article, “The Effects of Music Therapy-Singing Group on Quality of Life and Affect of Persons With Dementia: A Randomized Controlled Trial” by Heeyoun Kim Cho from the Department of Music Therapy at Temple University in Philadelphia, Pennsylvania gave significant checkpoints in the therapy trial using the QOL-AD scale. The thesis ‘A Short-Term Art Therapy Group for Individuals with Dementia’ by Brittney Hinkle from the Herron School of Art and Design under Indiana University. Both of these studies completed the QOL-AD scale (Appendix B).

As seen in Figure 2, music therapy began with roughly around the same score on the QOL-AD scale. Music intervention had a baseline score of 38.3 and art intervention had a baseline score of 37.66. These similar baseline scores gave both interventions a fair starting place. Each study collected data for a two-week period. This eliminated any inconsistencies concerning the fairness of one trial versus the other. By the end of the intervention, both QOL-AD scores had increased with music intervention increasing significantly while art intervention fell behind.

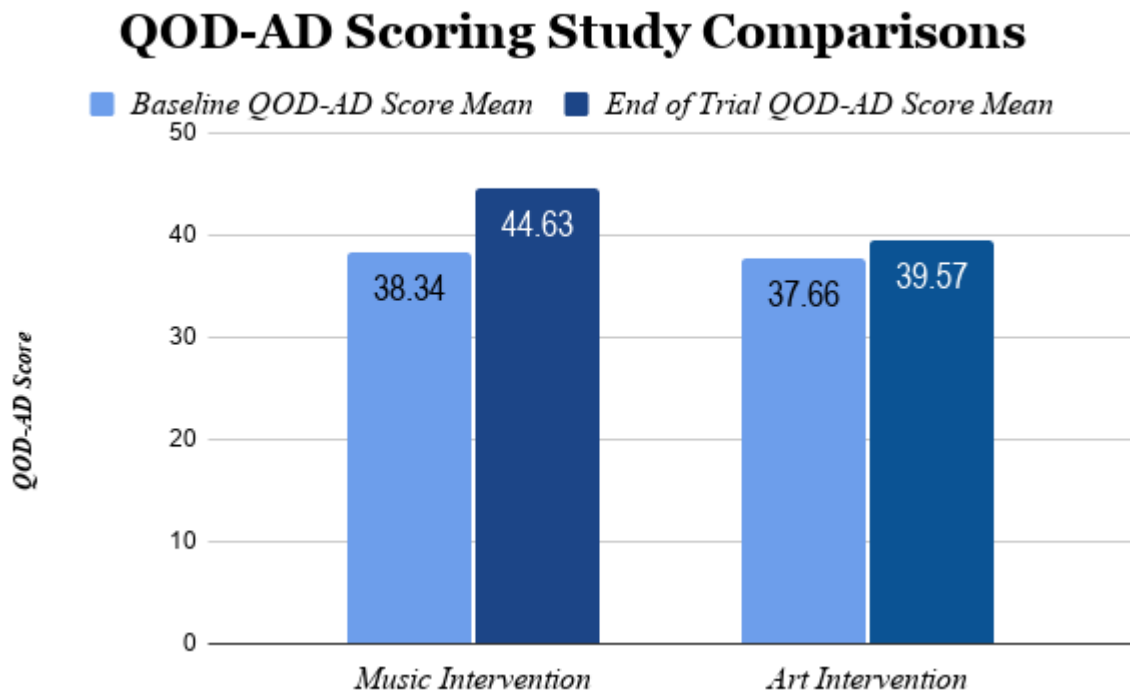


Figure 2: QOL-AD Scale Score Comparisons

At the end of both trials, each intervention increased by at least one point. As the bar graph above shows, the music-centered study concluded with a score of 44.63 on the QOL-AD scale while the art trial ended with a score of 39.57. To fully conclude one score had a higher jump than the other, the baseline score was subtracted from the end of the trial score to find the exact difference in the scores. As seen in Figure 3, music intervention had a much larger increase than art intervention did. The music-related activities caused a 6.29 point jump in its participants while art only saw around a 2 point increase. Therefore, music and art had a 4 point difference between their increasing scores.

	Music Intervention	Art Intervention
Difference in QOL-AD Scores	+ 6.29	+ 1.91

Figure 3: Differences in Before and After Scores

Qualitative Results

While the numbers point to an easy conclusion within the comparison of music and art-based interventions, it is crucial to see if there is a visible difference in the participants when they engage in the activities. Guests at an adult daycare showed observable differences between their reactions and attitudes towards each offered activity.

Music time was held in a big, old-fashioned room. Seating included recliners, couches, padded chairs, and loveseats. Each guest was encouraged to choose their seat and interact with those around them while waiting for the music to start. While they chose to make their seat selection, they disregarded those around them. Each day there was a different music theme within the period of music that the guests would recognize. In case a guest wanted to sing along or was unfamiliar with a song, binders were handed out with each song title and its lyrics. A majority of guests chose to take one of these binders with a few exceptions. Those who chose not to take a binder were not uninterested in the music, instead, they were familiar with the track of songs and already knew the lyrics.

Before the music started playing, the room remained quiet. Music time took place at the end of the guest's stay at around two in the afternoon. The silence was only broken when a participant noted that they felt as if the "music keeps [their] brain moving". This was the first piece of collected feedback that would be gathered in the study. Once the music began, the participants began to move in their seats and react to the music. Some guests showed their appreciation for the music while others sat and listened, staying completely still. Observable reactions varied from participant to participant. The most common, which all but few guests did, was tapping their foot to the beat of the music. Even if they were unable to keep up with the lyrics with the binder, they were able to keep the beat of the song.

There were a select few guests that showed more of a reaction than the others. These guests would sing along to every song with or without the binder. They engaged with those around them and commented on the songs they were listening to with their peers. Some songs were so familiar to the guests, they would roll up their binder and hit it on their knees to the beat as they sang to the song. This continued throughout the hour-long music session with guests getting more and more involved in the music as the time went on. There was an extremely noticeable dynamic change between the guests before and after the music time. Before the music had started, the guests isolated themselves from each other but after they engaged in conversation. The silence from before the tunes had turned into chatter and laughter. After music time had concluded for the day, a guest gushed about how music was their favorite part of the day and how it brightened their mood.

Music time was a great success between most of the participants, art-related activities did not have an extreme of an impact. Television time and game time was another option during both art and music time. Most

guests chose to sit in the room for music time while only four chose to sit down and do a craft. Similar to music time, art time started quiet. The guests were sat at a dining room table and allowed creative freedom when making their art.

A caregiver at the adult daycare ran and supervised art time while leading the participants in a guided craft. This is where a sense of frustration began. Unlike music time where the activity brought up a positive conversation, the guests started a conversation about how frustrated they were with the activity. Instead of bonding over their enjoyment, they started to bond over their hate for the craft. This was only the case for two of the participants. Another participant sat in silence and did not interact with the other guests as they had done during music time while the other enjoyed the craft.

Findings

After gathering both quantitative and qualitative data, it can be concluded that music-based therapies and interventions are more effective at decreasing agitation levels in dementia patients. This is shown through the different reactions and atmosphere created by those at the adult daycare and the differing scores on the QOL-AD scale from the content analysis.

As seen in Figure 3, the study utilizing music had a larger impact on the participant's QOL-AD scores. Music had a significantly higher score at the end of its trial compared to the art-based intervention although both had a relatively similar beginning score (Figure 2). This finding can help conclude the belief that although music and art can have a similar baseline effect on those with dementia, as a trial continues, the music builds and continues to impact the patient while art stops short. This is also seen within their four-point difference between their compared score. Music continued to improve the quality of life in dementia patients to the point where there was a four-point increase in its QOL-AD scores.

The difference of attitudes amongst the guests at the adult daycare also backs up the conclusion that music is more influential on agitation levels in a positive way, unlike art. Both activities do cause changes in agitation levels but music helps decrease them while art increases it. Also, the environment and conversations both activities created have many comparable differences; art has more negatives than positives. Music allowed the guests to bond over the memories each song brought and their familiarity. The music let them laugh with each other and sing together. Art did allow the guests to bond but not in a positive way. They created conversations based on complaints instead of the positivity that music brought. Art becomes an outlet for agitation at the adult daycare and music is where they would go to relieve it.

Fulfillment Concerning the Gap

In terms of dementia research, there are no strict non-pharmacological interventions that are known to reduce agitation levels. There are specific activities that could affect the symptoms but there have been no comparisons directly between these different interventions. First, the symptom that was targeted has not had significant research conducted around it. Agitation fell behind in the number of studies that had centered their research surrounding it compared to other symptoms such as depression. In the studies that did have agitation as its focal point, the studies were structured as literary and content analyses. There have been no studies that conducted a content analysis along with direct observations. Non-pharmacological interventions have also been studied but not directly compared. Music and art were both analyzed individually but were not mentioned within the same study in the library of dementia research.

Implications

The results from this study can be used to help caretakers and loved ones of those who are affected by dementia. Agitation is one of the most difficult behaviors to combat in regular people and especially in people who are slowly going through a cognitive decline. When concluding music interventions are more effective than art interventions, loved ones and caretakers have a general idea of which activity to introduce their dementia patient to. The conclusion of this research can help those who take care of dementia patients make a quick decision on what they should do with their loved ones during a time of agitation.

Suggestions for Future Research

For researchers looking to expand on the topic of non-pharmacological interventions and dementia, looking into other types of therapies. Many different interventions are used in reducing symptoms in dementia patients. A future researcher could also use the other types of interventions and replicate this study with a different dementia symptom. Incorporating the same participants measured for qualitative data as those that are observed is highly recommended. This allows for a direct connection between the numbers on the scale along with the observations. Future researchers have the potential to expand on their subject pool, involving different stages and types of dementia in their research. If future endeavors begin with this research, to eliminate bias, other researchers should consider gathering the opinions of the participants beforehand.

Acknowledgments

I would like to thank my advisor Jennifer Orlinski for her guidance.

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