



Featured Article

An individualized music listening program to reduce agitation in hospitalized patients with Alzheimer's disease and related dementias

Elizabeth J. Belenchia, DNP, RN, NE-BC*

Bridgeport Hospital – Milford Campus, Yale New Haven Health, 300 Seaside Avenue, Milford, CT 06460, United States



ARTICLE INFO

Article history:

Received 6 March 2023

Received in revised form 31 May 2023

Accepted 1 June 2023

Available online 22 June 2023

Keywords:

Dementia

Alzheimer's disease

Agitation

Non-pharmacological interventions

Individualized music listening

Music therapy

ABSTRACT

The sudden change in environment with hospitalization in patients with dementia can provoke feelings of agitation. Listening to music can be an effective intervention to decrease agitation because the part of the brain recognizing music is unaffected by dementia, and music can elicit feelings of happiness. This project aimed to reduce agitation in patients with Alzheimer's disease and related dementias (ADRD) by implementing an individualized music listening program. The sample included 21 patients diagnosed with ADRD admitted to a medical-surgical unit at a community hospital. The four-item Pittsburgh Agitation Scale (PAS) was completed by clinical staff to document the degree to which their patient exhibited four types of agitated behavior. A paired t-test yielded a statistically significant ($p < 0.001$) decrease in total scores from pre-test ($M = 4.83$, $SD = 2.10$) to post-test ($M = 1.38$, $SD = 1.40$). The findings demonstrate that implementing an individualized music listening program reduces agitation in patients with ADRD.

© 2023 Elsevier Inc. All rights reserved.

Introduction

Dementia is a progressive illness that affects the brain and causes many symptoms, such as memory loss, cognitive impairment, language problems, and the inability to carry out everyday tasks.¹ Admission to an acute care hospital can be a frightening and traumatic experience for this patient population because it takes them out of their familiar environment and thrusts them into an unknown place with unfamiliar faces, routines, noises, and procedures.^{2–4} The sudden change in environment and routine often provoke feelings of anxiety and agitation which contribute to poor patient outcomes, including increased length of stay, change in mental status, dehydration, falls, and staff frustration. Research has shown that non-pharmacological interventions using person-centered care techniques effectively reduce agitation in patients with Alzheimer's disease and related dementias (ADRD) in the acute care setting.^{4–7} The evidence demonstrates that individualized music listening is an effective person-centered care strategy to decrease agitation in patients with ADRD in the hospital setting.^{8–10}

Agitation among patients with dementia is a significant problem at all healthcare levels, from the national to the local level. Agitation can be described as restlessness, yelling, disruptive behaviors, resisting care, or aggressiveness.^{3,5,11} The prevalence of ADRD is rapidly growing within our nation. In 2021, 6.2 million Americans aged 65

and over were diagnosed with ADRD.¹ One out of every nine people aged 65 and over have ADRD, a prevalence of 11.3 % of the population.¹

Individuals with ADRD have special needs when admitted to an acute care hospital. Hospitalization can lead to many problems for this patient population, including increased agitation.⁶ Up to 90% of persons with ADRD experience behavioral and psychological symptoms of dementia, including agitation, aggression, and anxiety.^{5,12} These symptoms are exacerbated in the hospital because of the increased stress of unfamiliar surroundings, unmet needs, and attempts to control their situation.^{3,6} Research demonstrates that despite recommendations for non-pharmacological management of agitation in persons with ADRD, primary treatment is typically through pharmacological means with antipsychotics or benzodiazepines.^{7,12,13} However, pharmacological interventions can negatively impact the patient. Antipsychotic medications can cause adverse effects, including tardive dyskinesia, extrapyramidal side effects, and worsening confusion.^{10,14–16} Benzodiazepines can increase lethargy and the risk of falls and can worsen cognitive functions.¹³ Studies have shown that non-pharmacological interventions using person-centered care techniques, including individualized music listening, are more effective in reducing agitation in persons with ADRD in the acute care hospital setting.^{4–8,17} Person-centered care focuses on identifying the patient's individualized needs, including their values and choices, and addressing their unmet needs.⁷ Person-centered care interventions for hospitalized patients with ADRD are crucial to improving the quality and safety of care, as this patient

*Corresponding author.

E-mail address: Elizabeth.belenchia@bphthosp.org

population has specialized care needs. Individualized music listening is a person-centered intervention involving passive listening to a personalized music selection and has been shown to significantly reduce agitation in patients with ADRD.¹⁸ The music elicits feelings of happiness which in turn decreases agitation.^{19,20}

An extensive literature search supported an evidence-based, individualized music listening intervention to reduce agitation in patients with ADRD. The electronic databases searched include PubMed, CINAHL, ProQuest, Science Repository, Taylor and Francis Online, MEDLINE, and Directory of Open Access Journals. The key terms that were searched included "dementia," "Alzheimer's disease," "agitation," "nonpharmacological interventions," "individualized music listening," "music therapy," "personalized playlists," and "behavioral psychological symptoms of dementia." The Boolean operators AND and OR were used to provide focused results. Inclusion criteria included current studies from 2017 through 2022, published in the English language, peer-reviewed, and had the individualized music listening intervention and the patient population of patients living with dementia. In addition, the exclusion criteria included research articles greater than five years old, except seminal work, research published in a non-English language, non-peer-reviewed studies, opinion studies or literature reviews, research that did not include a form of individualized music listening, and research that did not have the patient population of patients living with dementia. Combining the key terms and search criteria produced 701 articles for review. Approximately 250 abstracts were reviewed, and although several articles supported the evidence-based intervention, 12 were selected to support the quality improvement project. These 12 articles were chosen because they most closely aligned with the inclusion criteria for the project.

The twelve quantitative research studies and systematic reviews all found that individualized music listening is an effective evidence-based intervention that reduces agitation in patients with dementia. The common theme among each study and systematic review are that individualized music listening is more successful than any other non-pharmacological intervention or other non-personalized music therapy.

Aim and objectives

This evidence-based practice improvement project aimed to reduce agitation by implementing an individualized music listening program for patients with ADRD in an acute care hospital. The focus of the project was to test the effectiveness of individualized music listening intervention at reducing levels of agitation in patients with ADRD. The objectives were to: (1) Measure patient agitation before and after they listened to their personalized music selection using direct observation with the Pittsburgh Agitation Scale (PAS)¹¹ and (2) Gather staff observations to document the effectiveness of the individualized music listening intervention.

Methods

Study design and participants

The project used a quasi-experimental, paired samples, pre-post design. The project site was an inpatient medical-surgical unit in a community hospital that is part of an extensive healthcare system. The medical-surgical unit has a 32-bed capacity and is typically full. The patient population on this unit consists of adults with a wide range of diagnoses, including respiratory and cardiac diseases, stroke, alcohol withdrawal and substance abuse disorders, gastrointestinal disorders, hospice care, end-stage renal disease requiring dialysis, and altered mental status. The length of stay on the unit is quite variable, ranging from two days to several months.

The population for the project included patients admitted to the hospital's inpatient medical-surgical unit. The patients were recruited for this project once they were admitted to the unit and identified as having a diagnosis of dementia. The inclusion criteria included patients of any age, sex, and race diagnosed with dementia and admitted to the medical-surgical unit for inpatient care. The exclusion criteria included family refusal, medically unstable patients, and patients with severe hearing impairment or complete hearing loss. Twenty-two patients were invited to participate in the project, and only one patient's family declined. This resulted in a sample size of $N=21$, with all participants completing the project.

Measures

The PAS¹¹ was used to measure patient agitation (Fig. 1). The PAS consists of four items, each assessing the intensity of a type of behavior associated with agitation: aberrant vocalization, motor agitation, aggressiveness, and resisting care. The tool uses a 5-point Likert scale ranging from 0 to 4. A rating of 0 indicates the behavior is not present. For ratings of 1 through 4, each item has its own wording related to the specific behavior. For example, the item "resisting care," has response choices of 0 = not present, 1 = procrastination or avoidance, 2 = verbal gesture of refusal, 3 = pushing away to avoid task, and 4 = striking out at caregiver. Written permission was obtained from the author. The PAS has been shown to be a valid and reliable tool.¹¹ Previous studies have reported Cronbach's alpha as 0.82 and 0.93.¹¹

Individualized music listening intervention

Prior to the start of the individualized music listening intervention, the project manager held educational sessions for the clinical staff on the medical-surgical unit conducting the intervention. The education consisted of a PowerPoint presentation developed by the project manager and an open forum for discussion. The presentation provided an overview of ADRD, person-centered care, the importance of non-pharmacological interventions to control behavioral symptoms, and the details of the individualized music listening intervention. In addition, step-by-step details of the individualized music listening protocol and instructions on completing the PAS pre- and post-intervention were provided. Staff who could not attend one of the five scheduled sessions were emailed a narrated PowerPoint presentation. A total of 40 RNs received the education. All staff received the same training to ensure the intervention was delivered in the same manner.

The individualized music listening intervention was developed using the evidence-based guideline: Individualized Music for Persons with Dementia.²⁰ The music therapy protocol, specifically tailored to the patient to emphasize their preserved abilities, successfully reduces agitation and can be used at any stage of dementia.^{18,20} The step-by-step protocol, written by the project manager, provides a simple reference to assist users in implementing the music therapy (Fig. 2).

Procedures

Following the individualized music listening protocol, the project manager and RNs identified patients admitted to the medical-surgical unit who met the inclusion criteria. The patients and their families, or caregivers, were interviewed using a standardized questionnaire to ascertain the patient's individualized music preferences.²⁰ The personalized songs were downloaded onto iPods using Spotify's premium subscription service. Before providing the patient with the iPod, the project manager or RN scored the patient's level of agitation using the PAS. The iPod was not left at the patient's bedside, instead was brought into the patient's room when the intervention was being

PITTSBURGH AGITATION SCALE

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

Reference: Rosen, J., Burzio, L., Killar, M., Cain, M., Allison, M., et al. (1994). The Pittsburgh Agitation Scale. *American Journal of Geriatric Psychiatry*, 2, 52–59.

Fig. 1. Pittsburgh agitation scale.

performed to reduce the effects of any potential confounding factors. Patients were then supplied with the iPod and optional headphones by the project manager or RN. The headphones were plugged into the iPod, and the volume was checked before placing the headphones on the patient. The goal was to give the patient the iPod at least 30 minutes before heightened agitation. However, each patient varied in terms of when this occurred. Some patients were given the iPod at a specific time of day. Others received the iPod before events that could potentially provoke agitation, such as medical procedures, mealtime, medication administration, and bathing. To meet the patient's individualized needs, while controlling for any variation in the intervention, the project manager or RN ensured the intervention protocol was consistently followed. When a patient was too agitated to wear the headphones, the music was played without the headphones through the iPod's built-in speaker. The delivery method of the music, whether it included headphones or the built-in speaker, was

not considered a confounding factor, because the intervention was specifically looking to see if the patient's agitation was decreased as a result of the music specifically.

Each music session lasted approximately 30 minutes. The project manager or RN would turn on the music and ensure the volume was at a level the patient could comfortably hear before applying the headphones. The patient was observed continuously throughout the intervention to ensure the patient's level of agitation did not increase. For consistency, the same observer remained with the patient for the duration of the intervention. Some patients listened to the music more than once per day.

Upon completion of the music session, the project manager or RN observer completed the PAS again to score the patient's agitation level, and the intervention response was documented in the end-of-shift nurse's note. If the patient's agitation level increased, the provider was notified to determine if additional interventions should be

Individualized Music Listening Protocol

1. Identify patients with Alzheimer's disease or related dementia at risk for agitation.
 - Ensure that any treatable cause of agitation is addressed, such as pain or illness.
2. Individualized music selection to include personal preferences.
 - Determine the significance of music before the onset of cognitive impairment.
 - Interview the patient using the "Assessment of Individualized Music Preferences 2nd Edition, (care recipient version)" form. Identify specific songs, artists, genres, and consider the patient's ethnic and religious background.
 - If the patient cannot provide this information because of advanced cognitive impairment, interview a family member using the "Assessment of Individualized Music Preferences 2nd Edition, (family or knowledgeable caregiver version)" form.
 - Download personalized music selections onto iPod
3. Provide personalized music to the patient
 - Optimal effectiveness is achieved when given 30 minutes before peak agitation (Each patient will vary, but times of agitation may include bathing, mealtime, a specific time of day, before a procedure, or before medication administration).
 - Provide the patient with the iPod and headphones
 - Music may be provided more than once per day depending on the individualized needs of the patient
 - If the patient is too agitated to wear the headphones, the music may be provided without the headphones, just using the built-in iPod speaker
 - Each music session should last approximately 30 minutes
 - The volume must be set at an appropriate level for the patient
4. Provide an ongoing assessment to determine the patient's response to the music.
 - Monitor the patient during the music intervention to ensure the music is not making the patient more agitated
 - If the agitation seems to be worse, stop the music and reassess the music preferences with the family.

Fig. 2. Step-by-step protocol for the Individualized Music Listening program.

initiated to help the patient. In addition, the project manager or RN would document their observations concerning the patient's response to further evaluate the music therapy's effects.

Data analysis

Statistical analyses were conducted using IBM SPSS Statistics version 27. Patient gender, age, and length of stay on the medical-surgical unit were analyzed with descriptive statistics. The PAS dataset was aggregated such that each patient's item ratings were averaged when their RN or project manager completed the PAS. This was done so that patients with a greater number of PAS completions would not have a larger impact on statistical results than those with relatively fewer completions. The aggregation was also necessary to maintain the sample size of $N=21$ rather than using the 83 total times the PAS was given to the entire sample. Following data aggregation, PAS total scores were computed by summing the numeric responses to the four PAS items. The possible range of PAS total scores was 0 to 16, with higher scores indicative of a greater intensity of agitation. Finally, descriptive statistics were calculated for the individual PAS items and total scores.

Assessment of normality of PAS total scores

Paired differences between pre-test and post-test PAS total scores were computed to evaluate the normality assumption of paired

samples t-tests. Differences were calculated by subtracting each patient's pre from the post-total score. Negative differences indicated that agitation decreased following the music therapy. The distribution of these paired differences was examined for normality using three methods: (1) skewness and kurtosis values; (2) Kolmogorov-Smirnov and Shapiro-Wilk normality tests; (3) visual inspection of a histogram. The values for skewness (-0.543) and kurtosis (0.164) were both within the criterion range of -1.00 to 1.00. The two normality tests were nonsignificant, indicating that the distribution did not deviate from a normal curve (Kolmogorov-Smirnov: $p=0.200$; Shapiro-Wilk: $p=0.517$). Finally, the histogram of paired differences appeared reasonably normal with no outliers. As all three methods demonstrated that the distribution was normal, a paired samples t-test was conducted to compare mean pre-test vs. post-test PAS total scores. The criterion for statistical significance was set at $p<0.05$.

Ethical considerations

This quality improvement project underwent a university and hospital Institutional Review Board (IRB) screening and received approval. Informed consent was unnecessary as the individualized music listening program was part of standardized patient care. Instead, consent was implied when the patient was admitted to the hospital for care. In addition, participants' privacy was protected using an encrypted flash drive that only the project manager could

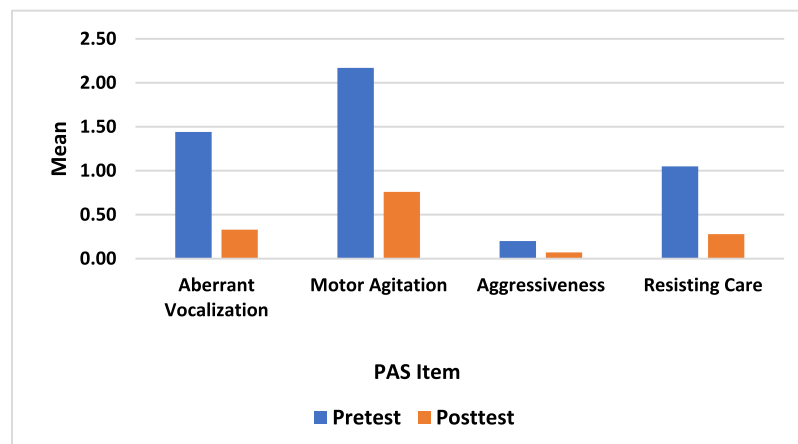


Fig. 3. Pre-test and post-test mean ratings of the four PAS items.

access. The only potential anticipated risk for the participants was the possibility of an increase in agitation related to listening to the music. Therefore, each participant was monitored by clinical staff during the music-listening period. If the patient appeared to be experiencing increased agitation due to the music, the music therapy session was stopped immediately.

Results

All patient demographics including age and sex were obtained from the electronic health record. The sample consisted of a greater percentage of females ($n=15$, 71.4%) than males ($n=6$, 28.6%). The mean age of patients was 84.19 years ($SD=8.78$), with a range of 70 to 95. On average, the length of stay was 4.05 days ($SD=4.04$) and ranged from 1 to 17 days.

Fig. 3 displays the mean ratings of the four individual PAS items in the pre-test and post-test. For all items, the average post-test rating was lower than the pre-test rating, demonstrating that agitation decreased in each of the four behavioral groups following the music-listening sessions. All post-test means were below 1.00 out of a possible range of 0.00 to 4.00. The largest decrease in scores was seen for Motor Agitation, with a difference of 1.41 between the pre-test and post-test (Pre: $M=2.17$, $SD=0.89$; Post: $M=0.76$, $SD=0.72$). Aberrant vocalization declined from an average rating of 1.44 ($SD=1.25$) to 0.33 ($SD=0.66$). The mean rating for Resisting Care decreased from 1.05 ($SD=0.94$) to 0.28 ($SD=0.53$). The smallest change occurred with aggressiveness, for which the means were both close to 0.00 in the pre-test ($M=0.20$, $SD=0.46$) and post-test ($M=0.07$, $SD=0.24$).

Descriptive statistics for the pre-test and post-test PAS total scores were computed (Table 1). The mean pre-test score was 4.83 ($SD=2.10$, $Mdn=5.00$) and ranged from 1.00 to 8.00. The average post-test score was markedly lower ($M=1.38$, $SD=1.40$) with a median of 1.00 and a range of 0.00 to 4.33. Overall, pre-test and post-test PAS total scores tended toward less severe agitation, given that the possible range of total scores was 0 to 16.

Table 1

Summary statistics for pre-test and post-test PAS total scores.

	Pre-test (N=21)	Posttest (N=21)
M (SD)	4.83 (2.10)	1.38 (1.40)
Median	5.00	1.00
Minimum	1.00	0.00
Maximum	8.00	4.33

Note: PAS total scores can range from 0 to 16. Higher means are indicative of greater agitation.

All except one participant received the intervention more than once, with each patient exposed to the intervention once per day. Table 2 displays the number of music interventions each patient received, in addition to the mean and range of pre- and post-PAS scores. Based on the patient's length of stay the number of interventions per patient ranged from one to sixteen, with a mean of 3.95 exposures.

The pre-intervention PAS scores ranged from 1 to 16 with a mean of 5.7 across all 83 interventions, or a mean of 4.83 as listed in Table 1 when looking at the total number of participants. The post-intervention PAS scores ranged from 0 to 10 with a mean of 1.7 across all 83 interventions, or a mean of 1.38 when looking at the total number of participants.

Table 3 presents the results from the paired samples t-test comparing mean PAS total scores in the pre-test and post-test. The mean of the paired differences was -3.45 ($SD=1.54$, 95% $CI=-4.15$ to -2.75). The t-test was statistically significant, demonstrating that the music therapy intervention significantly reduced agitation in patients ($t(20)=-10.269$, $p<0.001$).

Treatment fidelity

The design of the study was created so that the intervention was delivered consistently among all participants. The project manager was an RN, and all of the RNs involved in this study were employees of the hospital. The implementation of the project took place over ten weeks. For all participants, the intervention lasted approximately 30 minutes, was delivered only by the project manager or an RN, and followed the intervention protocol. All the RNs received the same training before delivering the intervention. The education was created by the project manager and was delivered in a consistent manner using a PowerPoint presentation and discussion. After each educational session, the RN was given a 10-question knowledge assessment test to ensure an understanding of the intervention. The knowledge assessment tests were done as a group at the conclusion of the session. A total of 40 knowledge assessment tests were administered, all of them receiving a score of 100 percent. To ensure delivery of treatment remained consistent, each RN was given written step-by-step guidelines to deliver the intervention. The guidelines provided a specific protocol for patient identification, personalizing the intervention, delivering the intervention, and providing an ongoing assessment. The patient's song choices were downloaded onto an iPod through Spotify's premium subscription service. The iPods were reset to original settings and secured to ensure safety. All functions of the iPod were deactivated except for the Spotify application. Each patient received the same intervention in the same conditions and

Table 2

Summary of # music interventions per patient with range and mean pre- and post-PAS scores.

Patient	# music interventions	Range of pre-PAS scores	Mean pre-PAS score	Range of post-PAS scores	Mean post-PAS score
1	16	2-16	7.2	0-10	2.1
2	3	5-10	6.7	0-2	0.7
3	5	2-8	4.4	0-3	1.2
4	2	3-7	5	0-2	1
5	3	2-3	2.3	0-0	0
6	2	2-3	2.5	0-0	0
7	2	6-10	8	3-3	3
8	2	3-3	3	0-0	0
9	3	6-7	6.3	0-7	4.3
10	2	2-6	4	0-1	0.5
11	3	6-11	7.7	0-2	0.7
12	2	1-1	1	0-0	0
13	2	3-3	3	0-0	0
14	5	4-4	4	0-0	0
15	2	1-4	2.5	0-1	0.5
16	1	N/A	6	N/A	3
17	2	5-5	5	2-2	2
18	6	5-5	5	1-1	1
19	2	3-3	3	2-2	2
20	14	8-8	8	3-3	3
21	4	6-7	6.8	4-4	4

the intervention was implemented as intended. The project manager or RN was always the one to give the patient the iPod. The majority of the interventions were delivered by the project manager due to time constraints from the RNs. During times of lower census and acuity, the RNs were able to deliver the intervention and stay with the patient for 30 minutes. The patients who used the headphones kept them on throughout the intervention period to ensure the music was delivered for the entire 30 minutes. Based on the data analysis of the PAS for all 21 patients, the results of the project were statistically significant ($p < 0.001$) demonstrating that the individualized music listening intervention reduces agitation in patients with ADRD.

Discussion

The results supported the aim of reducing agitation in hospitalized patients with ADRD by implementing an individualized music listening program. Each of the four items on the PAS was lower post-intervention, indicating that agitation symptoms decreased following the music therapy sessions. The most significant decrease in agitation was in the category of motor agitation, followed by aberrant vocalization, resisting care, and aggressiveness. PAS total scores also decreased from the pre-test to the post-test; the change was statistically significant.

There was a wide range of music choices that the patients preferred. Some of the most popular choices included music by Frank Sinatra, Bing Crosby, Tony Bennett, and Ella Fitzgerald. One common characteristic of most patients was choosing music popular in their teenage and early adulthood. Some of the more unique music selections included accordion music and parade songs. The patient who enjoyed the accordion music used to play the accordion for fun, and he would mimic playing the accordion as he listened to the songs. A female patient chose to listen to parade songs because she would always attend local parades with her family as a child.

The findings of this project support prior research, which showed that individualized music substantially impacts decreasing agitation in hospitalized patients with dementia. The project provides evidence that individualized music listening should be considered a first line of treatment instead of pharmacological interventions. The findings also contribute to the body of knowledge supporting music therapy as a beneficial type of person-centered care that can be individually tailored to the patient's unique needs.

Table 3

Paired t-test comparing pre-test vs. post-test PAS total scores.

<i>M</i>	<i>SD</i>	<i>SEM</i>	Paired Differences		<i>t</i> -test <i>t</i>	<i>df</i>	<i>p</i>
			95% <i>CI</i> Lower	Upper			
-3.45	1.54	0.34	-4.15	-2.75	-10.269	20	<0.001

Staff observations

The staff was continually amazed by how responsive the patients were to the personalization of their music and how immediate the effect was in reducing their agitation. One of the first participants in the program was a gentleman who quickly became agitated and resistive to any nursing care. Immediately after putting the headphones on this patient and playing the music, he started smiling, clapping, and moving his head to the music. Finally, he relaxed enough to allow the clinical team to care for him. Another patient kept wandering around the unit looking for his wife and was difficult to redirect. When given the headphones and music, he was easily redirected back to his room, put his feet on the bed, and began doing a puzzle. He would hum along and smile as he continued to listen to the music. A third patient was nearing the end of his life and would become agitated when receiving treatments. He did not like the headphones but enjoyed listening to Haitian gospel music through the built-in speaker to reduce his anxiety.

One patient, in particular, had mixed results. Her agitation presented in loud vocalizations. When music was first played for this patient, she immediately stopped yelling, closed her eyes, and smiled. However, after about five minutes of leaving the room, she started screaming, "I hate this." The staff went in and changed the song. She initially started screaming the name of the band, "Beatles," repeatedly until she quieted down. After a few more minutes, she began to scream, "I hate this" again. The staff stopped the music, and she later said that the music confused her. The team tried it several times throughout her stay with varying success.

One of the most profound examples was with a woman who had become increasingly agitated, and the nursing team was not having any success calming her down. After sitting with the patient for a few minutes and talking, it became apparent she was angry because she

thought her daughter had abandoned her. She kept yelling profanities when referring to her daughter. She said she wanted to die and would do so by holding her breath. She demonstrated holding her breath and then began yelling about her daughter again. She continued talking, and the staff asked her what she likes to do at home, and she said she watches television. When asked what shows she watches, she responded, "Sinatra." She began talking about music at this point and identified several bands that she enjoyed. Staff grabbed one of the iPods and quickly downloaded a playlist for this patient.

Meanwhile, the nurse obtained an order from the physician to administer Haldol, an antipsychotic, to calm the patient's agitation. The nurse returned to the room with the medication and was asked to please hold off by the project manager. The project manager spent about 30 minutes with this patient and listened to the patient's favorite songs with her. Toward the beginning, she would say she did not want to listen but would stay with the project manager to listen. The project manager told her that she would like to listen to another song, and each time she would respond to how much she loved the song and smiled. The nurse disposed of the Haldol, and the patient eventually fell asleep. This is an excellent example of how the current practice of administering antipsychotic medication is not always the most effective way of managing agitation.

Limitations and strengths of the project

One limitation of the project is a smaller sample size than anticipated. The goal was to have 25–30 patients participate, but the actual sample size was 21. The smaller sample size was multifactorial and included time limitations, periods of low hospital census, and fewer people meeting inclusion criteria than expected. One of the most significant factors contributing to the smaller sample size was that many patients had severe hearing impairment. While many of these patients wear hearing aids at home, they did not bring them into the hospital setting. A significant strength of this project highlights the need for individualized, person-centered interventions for patients with AD/DRD in the acute care hospital setting. The majority of previously done studies focus on long-term care settings.

Implications and recommendations for nursing practice

The implication for nursing and healthcare outcomes is that non-pharmacological interventions are the best practice for managing agitation symptoms.¹² However, research shows that most facilities use pharmacological means to control agitation in patients with dementia.¹³ Also, non-pharmacological interventions using person-centered care techniques such as individualized music listening are more effective in reducing agitation in patients with dementia in the acute care hospital setting than administering as-needed medication and restraints.¹² In addition, the individualized music listening program's success is a model for other units with similar patient populations.

Based on the program results, several recommendations can be considered for the nursing profession and nurse leaders. Specifically, there is an absence of person-centered care interventions to manage agitation in patients with dementia in the acute care hospital setting. However, the evidence in the literature and the project results revealed that individualized music listening, as a person-centered intervention, has a tremendous impact on decreasing agitation in patients with AD/DRD. Therefore, person-centered care interventions, specifically individualized music listening, should be incorporated into the patient's care plan upon admission to the hospital.

An additional recommendation would involve the patient's family as much as possible. The family often has the most meaning in the patient's life. Therefore, the family is crucial in identifying the patient's personalized music selections to ensure the maximum benefit is received from the music therapy. In addition, the family can

help determine when the patient is exhibiting the first signs of agitation and quickly implement the music intervention. Perhaps individualized music listening could be extended to use at home or elsewhere outside the hospital setting.

Identifying patients from the start of the hospital stay would be beneficial in optimizing the effectiveness of the intervention. The earlier the intervention is implemented, the more benefit the patient may experience. As illustrated by the results of the individualized music listening program, the patient can avoid unnecessary medication and restraints that can be detrimental to their stay.

Lastly, there is limited research on the effects of individualized music listening in the acute care hospital setting. Much of the research has been conducted in extended care facilities or assisted living settings where the patients are long-term. However, the short-term benefits of the individualized music listening program are invaluable to achieving quality outcomes for the patient.

Conclusions

Overall, this evidence-based practice change project illustrated that individualized music listening is an effective intervention that can be used successfully to reduce agitation in patients with dementia in the acute care hospital setting. Personalized music improves the patient's experience and makes the hospitalization a little less frightening while contributing to better patient outcomes. The project's success contributes to the body of scientific knowledge in providing safe, quality care to patients with dementia while in the hospital. Non-pharmacological, person-centered care interventions such as individualized music listening should be considered the first line of treatment in managing behavioral and psychological symptoms of dementia.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of Competing Interest

None.

Acknowledgments

The author would like to send their sincerest gratitude to all the people who participated in the project, including the patients, and the clinical team at the project site.

References

1. Alzheimer's Association. *Alzheimer's Disease facts and Fig.s*. 2021. Accessed November 23, 2021; <https://www.alz.org/media/documents/alzheimers-facts-and-Fig.s.pdf>.
2. Digby R, Lee S, Williams A. The experience of people with dementia and nurses in hospital: an integrative review. *J Clin Nurs*. 2017;26(9–10):1152–1171. <https://doi.org/10.1111/jocn.13429>.
3. Fogg C, Griffiths P, Meredith P, Bridges J. Hospital outcomes of older people with cognitive impairment: an integrative review. *Int J Geriatr Psychiatry*. 2018;33(9):1177–1197. <https://doi.org/10.1002/gps.4919>.
4. Surr C, Smith S, Crossland J, Robbins J. Impact of a person-centered dementia care training programme on hospital staff attitudes, role efficacy and perceptions of caring for people with dementia: a repeated measures study. *Int J Nurs Stud*. 2016;53:144–151. <https://doi.org/10.1016/j.ijnurstu.2015.09.009>.
5. Bessey L, Walaszek A. Management of behavioral and psychological symptoms of dementia. *Curr Psychiatry Rep*. 2019;21(8):1–11. <https://doi.org/10.1007/s11920-019-1049-5>.
6. Rosvik J, Rokstad A. What are the needs of people with dementia in acute care hospital settings, and what interventions are made to meet these needs? A systematic integrative review of the literature. *BMC Health Serv Res*. 2020;20(1):1–20. <https://doi.org/10.1186/s12913-020-05618-3>.

7. Tay F, Thompson C, Nieh CM, Nieh CC, Koh H, Tan J, Yap P. Person-centered care for older people with dementia in the acute hospital. *Alzheimer's Dementia*. 2018;4:19–27. <https://doi.org/10.1016/j.jamda.2017.12.009>.
8. Bakerjian D, Bettega K, Cachu A, Azzis L, Taylor S. The impact of Music and Memory on resident level outcomes in California nursing homes. *J Am Med Dir Assoc*. 2020;21(8):1045–1050. <https://doi.org/10.1016/j.jamda.2020.01.103>.
9. Gaviola M, Inder K, Dilworth S, Holliday E, Higgins I. Impact of individualised music listening intervention on persons with dementia: a systematic review of randomised controlled trials. *Australasian J Ageing*. 2018;39(1):10–20. <https://doi.org/10.1111/ajag.12642>.
10. Tsoi K, Chan J, Ng Y, Lee M, Kwok T, Wong S. Receptive music therapy is more effective than interactive music therapy to relieve behavioral and psychological symptoms of dementia: a systematic review and meta-analysis. *J Am Med Dir Assoc*. 2018;19(7):568–576. <https://doi.org/10.1016/j.jamda.2017.12.009>.
11. Rosen J, Burgio L, Kollar M, Cain M, Allison M, Fogleman M, Michael M, Zubenko G. The Pittsburgh agitation scale: a user-friendly instrument for rating agitation in dementia patients. *Am J Geriatr Psychiatry*. 1994;2(1):52–59. <https://doi.org/10.1097/00019442-199400210-00008>.
12. Ijaopo E. Dementia-related agitation: a review of non-pharmacological interventions and analysis of risks and benefits of pharmacotherapy. *Translat Psychiatry*. 2017;7(10):1–11. <https://doi.org/10.1038/tp.2017.199>.
13. Carrarini C, Russo M, Dono F, Barbone F, Rispoli M, Ferri L, Di Pietro M, Digiovanni A, Ajdinaj P, Speranza R, Granzotto A, Frazzini V, Thomas A, Pilotto A, Padovani A, Onofri M, Sensi S, Bonanni L. Agitation and dementia: prevention and treatment strategies in acute and chronic conditions. *Front Neurol*. 2021;12:1–18. <https://doi.org/10.3389/fneur.2021.644317>.
14. Garrido S, Dunne L, Chang E, Perz J, Stevens C, Haertsch M. The use of music playlists for people with dementia: a critical synthesis. *J Alzheimers Dis*. 2017;60(3):1129–1142. <https://doi.org/10.3233/JAD-170612>.
15. Gomez-Romero M, Jimenez-Palomares M, Rodriguez-Mansilla J, Flores-Nieto A, Garrido-Ardila E, Gonzalez-Lopez-Ariza M. Benefits of music therapy on behaviour disorders in subjects diagnosed with dementia: a systematic review. *Neurologia*. 2017;32(4):253–263. <https://doi.org/10.1016/j.nrl.2014.11.001>.
16. Kwak J, Anderson K, Valuch K. Findings from a prospective randomized controlled trial of an individualized music listening program for persons with dementia. *J Appl Gerontol*. 2020;39(6):567–575. <https://doi.org/10.1177/0733464818778991>.
17. Huber A, Oppikofer S, Meister L, Langensteiner F, Meier N, Seifert A. Music & memory: the impact of individualized music listening on depression, agitation, and positive emotions in persons with dementia. *Activities, Adapt Aging*. 2021;45(1):70–84. <https://doi.org/10.1080/01924788.2020.1722348>.
18. Shiltz D, Lineweaver T, Brimmer T, Cairns A, Halcomb D, Juett J, Beer L, Hay D, Plewes J. Music first": an alternative or adjunct to psychotropic medications for the behavioral and psychological symptoms of dementia. *GeroPsych*. 2018;31(1):17–30. <https://doi.org/10.1024/1662-9647/a000180>.
19. Alzheimer's Association. *Art and Music*. 2021. Accessed November 21; <https://www.alz.org/help-support/caregiving/daily-care/art-music>.
20. Gerdner L. *Evidence-Based Guideline: Individualized Music for Persons with Dementia*. 7th Ed. 2021.. Accessed July 2; <file:///C:/Users/nurse/Downloads/EBGIndividualizedMusic7thEd2021.pdf>.