The use of music in aged care facilities: A mixed-methods study

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Abstract

Music is frequently used in aged care, being easily accessible and cost-effective. Research indicates that certain types of musical engagement hold greater benefits than others. However, it is not clear how effectively music is utilized in aged care facilities and what the barriers are to its further use. This study used a mixed-methods paradigm, surveying 46 aged care workers and conducting in-depth interviews with 5, to explore how music is used in aged care facilities in Australia, staff perceptions of the impact of music on residents, and the barriers to more effective implementation of music in aged care settings.

Music is increasingly common in aged care settings, having being popularized through programs such as the documentary "Alive Inside" (Rossato-Bennett, 2014). Both anecdotal and empirical evidence suggest that musical engagement leads to improved quality of life for older adults (Hays and Minichiello, 2005). In residential aged care settings (nursing homes), music interventions typically include the following activities: (1) playing prerecorded music in group settings, (2) playing personalized playlists of prerecorded music to individuals, (3) live music performed in group settings, (4) active musical engagement such as use of musical instruments and sing-alongs, and (5) formal therapy sessions facilitated by a trained music therapist.

Of these, formal music therapy appears to have the greatest volume of evidence in support of its benefits (O'Connor et al., 2009). Music therapy, as opposed to more incidental exposure to music in healthcare settings as well as

planned musical activities that are not therapist-led, involves a therapist–patient relationship and a program of musical engagement tailored to both the tastes of the individual and the intended therapeutic outcomes (Bonde, 2015). It can take the form of active engagement with music, such as singing and playing musical instruments, or receptive forms, including listening to live or prerecorded music. Some studies have reported that music therapy can significantly reduce agitation, depression, and problem behaviors in people with dementia (Raglio et al., 2015). However, some recent reviews and meta-analyses have revealed a lack

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of methodologically robust studies about music therapy in aged care facilities (Baird and Samson, 2015; Li et al., 2015), with some studies even suggesting that music therapy may in fact be no more beneficial than other enjoyable activities (Narme et al., 2014). Other reviews suggest that active music therapy in group settings tends to have the most positive benefits (Garrido et al., 2017; Zhang et al., 2017).

On the other hand, playing prerecorded music in group settings tends to have the least benefits for residents of aged care facilities. This may be because group interventions fail to account for the musical tastes of individuals (Nair et al., 2013). The use of personalized playlists rather than group music listening generally appears to be a more helpful way to use prerecorded music, with reduced agitation being among the most frequently observed benefits in institutionalized adults (Garrido et al., 2017). However, emerging research indicates that these interventions can also have negative outcomes since music selections may not have considered the individual's clinical presentation. For example, people with high levels of agitation may require more calming music than people who are dysphoric and withdrawn. Research has also demonstrated that particular care may need to be taken with music selections for people with a history or current symptoms of depression (Garrido et al., under review). Nevertheless, the use of personalized playlists holds some promise as a useful alternative to music therapy or live musical performances, given the relative cheapness and accessibility of prerecorded music (Garrido et al., 2017).

Despite the evidence regarding the comparative effectiveness of different types of musical engagement, the extent to which aged care facilities are able to implement music successfully is unclear. Given its ease of administration, it may be that playing prerecorded music in group settings is the most frequent form of musical engagement in many aged care facilities. Although prior studies have examined the typical patterns of use and the benefits of music for healthy older adults living at home (Hays and Minichiello, 2005), to the best of the

authors' knowledge, no prior study has investigated this across multiple aged care facilities. If music interventions are to be successfully implemented in healthcare contexts, it is essential that the perspective of healthcare workers is considered in the design of such interventions.

Colquhoun et al. (2017) identified four steps in knowledge translation and intervention design that requires changing behavior in healthcare workers: (1) identifying barriers, (2) linking barriers to intervention component selection, (3) using theory, and (4) engaging end-users to provide feedback on feasibility of potential interventions. This study aimed to perform this first step by ascertaining the following:

1. Perceptions of staff in aged care facilities about how music is being used in aged care facilities in Australia;
2. What insights aged care workers have about situations in which music can impact the mood and behavior of people in aged care facilities;
3. Perceptions of workers in aged care facilities about the barriers that exist for further implementation of music interventions in residential aged care facilities.

The study aimed to extend beyond understanding the benefits of music, instead exploring staff perceptions about the feasibility and practicality of implementation of music interventions within an aged care setting. Similarly, this study aimed to highlight the barriers to music use identified by individuals working in the field, with the hope of generating solutions. On a broader scale, it is anticipated that this increased understanding will facilitate the development of evidence-based protocols for the use of music in aged care.

Study design

This research was conducted under a realism paradigm (Sobh and Perry, 2006), which takes a middle ground between constructivism and

positivism (Hall, 2013). Realism values multiple methods of data collection and varied analytical methods to compare "perceptions" of reality (Sobh and Perry, 2006). Therefore, a mixed-methods approach was followed (Johnson et al., 2007), using both a concurrent nested and a sequential explanatory design (Creswell et al., 2003). Phase 1 of the study (the concurrent nested design) consisted of an online survey in which quantitative and qualitative data were collected. The quantitative data were the predominant data collection method within the survey; however, both qualitative and quantitative data were integrated in analysis. The results informed a subsequent phase (Phase 2: the sequential exploratory design) in which more detailed qualitative data were collected through interviews to assist in explaining and interpreting the findings of the first phase (Figure 1).

Phase 1: online questionnaire

Methods

Participants. The sample consisted of 46 aged care workers recruited from aged care facilities across Sydney, Australia. A list of all aged care facilities in the area was compiled and randomized using a random number generator. Facilities were then contacted by phone and interested parties were emailed further information and a link to an online survey. Participants were primarily females (93%) aged 23–68 years ($M=47.60$, standard deviation (SD)$=13.19$). The majority were recreational officers (40.8%) or directors of nursing (16.3%), with the remainder having titles such as diversional therapist, care manager, or lifestyle coordinator, with an average of 11.68 years of experience in their role (range 1–34, $SD=9.57$). Most had no experience playing a musical instrument or singing (65.1%).

Procedures. After obtaining ethics approval, the online survey was administered via Qualtrics software and was completed in the participants' own time, taking approximately 15–20 minutes. An opening screen gave information about the
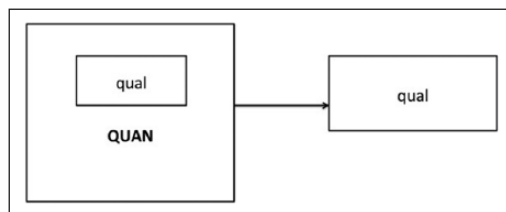
Figure 1. Concurrent nested and sequential exploratory design.

study, and participants were informed that by continuing they were indicating their consent to participate in the study.

Measures. The survey consisted of 17 items designed by the researchers in three sections. In addition to demographic information including the location of the facility where the participant works, the first section collected information about the participant's musical experience and ways in which music is used in their facility. In section 2, respondents were asked to rate the extent to which music had a positive effect on their residents' mood, social engagement, alertness, agitation, and problem behaviors on a scale of 1 (*Not at all*) to 5 (*A great deal*). In section 3, a number of open-ended questions allowed participants to detail situations in which they had observed adverse reactions to music and to comment further on barriers to implementing music more extensively. In addition, participants were asked to provide an email address if they were willing to be interviewed further about their responses (see Supplementary Materials for the online questionnaire).

Data analysis. Statistical analyses were performed using SPSS 22.0. Qualitative data from open-ended questions were inductively coded and subjected to thematic analysis (Braun and Clarke, 2006).

Results

The majority of survey respondents (82.5%) were from facilities in the South or Western suburbs of Sydney in areas of predominantly

Table 1. Pearson's correlation coefficients for frequency of music use and effects.

	Mood	Social engagement	Alertness	Agitation	Problem behaviors
Frequency of music use	$r = .21$ $p = .17$	$r = .32$ $p = .04$	$r = .21$ $p = .19$	$r = .11$ $p = .49$	$r = .13$ $p = .41$

low socioeconomic demographics, with only 17.5 percent being from areas of high socioeconomic advantage in the Northern or Eastern suburbs of Sydney.

Use of music. The majority of respondents (53.5%) reported that music was used daily in their facilities, while 37.2 percent reported using it several times per week. Only 9.4 percent used it once a week or less. A Mann–Whitney U-test revealed no significant differences between facility location and the frequency with which music was used ($U = 84$, $p = .25$.)

A range of musical activities were reported. The most frequent forms of musical engagement were listening to live music performed by a visiting musician (82.6% of respondents) and communal sing-along sessions (80.4%). Other forms included listening to individual music through headphones (61.0%), communal music listening through loudspeakers (52.2%), listening to individual music through loudspeakers (50.0%), attendance of music performances off-site (50.5%), and live music performed by a staff member (45.7%). Music therapy was the least frequently reported method of musical engagement, with group music therapy sessions being reported by 21.7 percent of respondents and individual music therapy sessions reported by 15.2 percent. The majority of facilities (73.9%) had musical instruments available for use by individual residents.

Effects of music. The strongest reported effect that musical engagement was perceived to have was on the mood of participants ($M = 4.65$, $SD = 0.84$), although generally positive effects were reported for each of the dimensions of social engagement ($M = 4.53$, $SD = 0.94$), alertness ($M = 4.33$, $SD = 0.85$), problem behaviors

($M = 4.07$, $SD = 0.93$), and agitation ($M = 4.01$, $SD = 1.01$). Respondents were also asked to rate which residents they believed benefited most from the forms of musical engagement available at their facility. People with mild dementia were generally believed to benefit the most from musical engagement (63.2%), followed by individuals who were depressed (61.4%), people with moderate dementia (59.1%), individuals who were anxious or agitated (56.1%), individuals with difficult behaviors (52.6%), individuals with severe dementia (49.1%), and people with physical disabilities (45.6%).

Pearson correlations were calculated to explore the degree to which the frequency of music use in a facility was associated with the perceived benefits (Table 1). Only social engagement was significantly correlated with the frequency of music use.

In open ended responses, positive responses to music were reported, including increased interaction between residents and participation in group activities after sing-alongs and reductions in agitation and repetitive or troublesome behaviors. For example, residents who repeatedly call out or ask to go home are less agitated and less likely to attempt to leave the facility after listening to music. One participant described a resident with younger onset dementia "who usually just walks continually unable to sit for any period of time" but "can actually sit for long periods (an hour) listening and watching visiting musicians" (Director of Nursing, Western Sydney).

However, 61 percent reported observing situations in which music had been ineffective or had an adverse effect. Descriptions revealed that music could sometimes increase agitation or aggressive behaviors in residents or could be overstimulating. For example, one Diversional

Table 2. Interview participant demographics.

Participant number	Gender	Region of Sydney	Job title
1	Female	Eastern suburbs	Diversional therapist
2	Male	Eastern suburbs	Diversional therapist
3	Female	Inner West	Diversional therapist
4	Female	South Sydney	Head recreational officer
5	Female	South Sydney	Care manager

Therapist from a regional area reported that harp music played at their facility could be "soothing for some agitated individuals but can actually make some behaviours worse with others." Situations in which negative responses were most frequently reported were where the music was too loud or repetitive or where the music triggered sad memories. For example, another reported that a resident had become "extremely upset over a song we eventually discovered through talking with family that it was her wedding song" (Recreational Officer, Southwest Sydney).

Resident reactions often appeared related to their prior mood. For example, if the resident was already feeling agitated or anxious, "boisterous music playing can make them want to flee or become aggressive" (Recreational Officer, Western Sydney). Other unmet needs such as distress over pain or the departure of relatives could also reduce the capacity for residents to respond positively to music. However, it was noted that one-on-one music programs were more effective for people with problematic behaviors or agitation, and that while music might invoke an adverse response one day, it could be received positively on another occasion.

Barriers to music use. Almost all survey respondents (90%) endorsed the benefits of individual residents having access to their own personally selected playlists as often as needed. However, a number of barriers to implementing individual music were identified, including time commitments for staff (35%), cost of equipment (22.5%), and education of staff (15%). A chi-square test of independence revealed that there was no statistically significant difference in the likelihood of cost being a barrier for respondents working in the South/Western suburbs compared to the North/Eastern suburbs, $\chi^2(1, N=37)=.09$, $p=.77$. Response to open-ended questions revealed that participants would like to see individuals having access to their own personal music, including music from their country of origin, having a regular music therapist available, and more regular visits from performers.

Phase 2: interviews

Method

Participants. Phase 2 consisted of a sample of five aged care workers from different facilities. They had been recruited as a follow-up from Phase 1 when respondents were invited to provide their email address if they were willing to be interviewed (see Table 2). Five participants had provided their email addresses, and all five participated in the interviews after providing written consent. Interviews were conducted within 2 months of completing the survey.

Procedure. Informed consent was obtained prior to the interviews. Interviews were conducted over the phone and recorded using a Zoom H5 Handy Recorder with participant consent, typically lasting between 15 and 30 minutes. At the end of the interview, participants were debriefed about the purpose and broader aims of the study.

Interviews were conducted using a semistructured guide. The questions aimed to gain deeper insight into the ways in which music is used within aged care facilities, the perceived

benefits of music, experiences surrounding adverse reactions to music, and potential barriers for further implementation of music. Responses to these questions generated follow-up questions that expanded further upon these areas and related subjects that arose in the interviewee's responses (see Supplementary Materials for a copy of the interview guide).

Data analysis. Interviews were transcribed verbatim and thematic analysis performed to identify the broader explicit and implicit themes within the data (Braun and Clarke, 2006). An inductive analysis style was used, with coding derived from the data rather than preexisting theory. Two researchers independently familiarized themselves with the data set and made preliminary notes regarding possible codes. Subsequently, a series of initial codes was derived from the data that reflected common patterns and themes. Codes were refined during subsequent runs through the data. In this stage, 270 segments of data were assigned to 24 codes. In iterative processes involving discussion among the researchers and constant comparison to assess and re-assess the patterns against the developing themes, the codes were clustered into three broad, higher order, latent themes, with 10 sub-themes, some of which contained lower level sub-themes as well (Table 3). Higher order themes and sub-themes (Level 1) tended to include multiple related concepts that had been expressed by several participants in varying way, while lower order sub-themes could consist of a concept that was expressed by at least one participant. Finally, the researchers collaboratively drew meaning from the themes and determined the ways in which they were interconnected and contributed to the existing research.

Results

Types of musical activity. As revealed in Phase 1, there was substantially less reference to individual music engagement in comparison with group activities among participants. However, those who did reference individual music most commonly referred to the use of personal iPods

and headphones:

> We offer individualized iPods and playlists for each person in the facility. (Participant 3)

In some instances, these devices were provided by families and in others through formalized programs.

Group activities sometimes involved formal programs and activities such as visits from entertainers/musicians, music therapy sessions, musical outings, and school choir visits:

> We have monthly entertainers; usually they will be singers—highly popular. Concerts are the biggest drawcards, particularly musicians, singers, or singers who can interact with the residents as well as just singing a song. (Participant 4)

Other group music activities were impromptu, informal, and staff-led, including staff playing the piano, sing-alongs, culturally themed music listening, dancing, radios in common areas, drum circles, and music DVDs.

Impact of musical engagement

Benefits: affective state. Changes in affective states were noted, including improvements in general mood. One participant reported that this occurred even where participants did not appear to understand the music:

> We do lots of music DVDs for the dementia unit downstairs, just because even if they don't understand it, it just seems to make them happy. (Participant 1)

In addition, music was identified as a tool that can be used to moderate levels of agitation in residents, in some cases as an alternative to medications:

> Sometimes if someone is agitated you might pop their iPod on and see how they respond to that first, prior to giving them medication. (Participant 3)

> I can tell with a couple of my residents when they are starting to get really agitated, so I'll say "do you want your music?" and I'll put the music on

Table 3. Major themes and sub-themes from the final stage of coding.

Major theme	Sub-theme Level 1	Sub-theme Level 2	Sub-theme Level 3
Types of musical activities	Individual music listening		
	Group music activities	Formal programs/facility organized	
		Impromptu/staff organized	
Impact of musical engagement	Benefits	Changes in affective states	Decreased anxiety
			Decreased agitation
		Reductions in problem behaviors	Increased compliance with care
			Decreased intrusive behaviors
		Social interactions/ connectedness	Increased connection between residents
			Connecting to the past
		Physical & cognitive changes	Increased physical stability
			Increased verbal responsiveness
	Negative responses	Disinterest & dislike	
		Increased distress and other negative emotions	
		Overstimulation	
	Factors contributing to response	Level of interactiveness	
		Timing	
		Instruments used	
		Stigma associated with music therapy	
		Type of dementia and level of decline	
		Relevance of music to cultural background	
Barriers for music use	High cost and lack of funding		
	Lack of variety in available performers		
	Time commitments for staff		
	Staff interest and knowledge		
	Difficulty obtaining information about individual tastes		

and straight away near enough it completely calms them down. (Participant 3)

Similarly, the way in which music can be used to reduce symptoms of anxiety was noted:

I have seen on numerous occasions where there has been a resident who is crying or depressed or anxious and after I've done a session with them they are smiling, calm and happy, it can really turn things around. (Participant 2)

One interviewee noted that while people without dementia may have many activities that they could relate to and that could provide mental stimulation and emotional regulation, for people with more advanced dementia "music is the only thing that seems to calm them down and stop them getting stressed" (Participant 3).

Benefits: problem behavior. In addition to improvements in affective state, reductions in problem behaviors were mentioned frequently. One said,

> We also have a lady who wanders, intrusive. Head down, no eye-contact … she's been difficult to toilet and undress … I started singing to her a simple nursery rhyme. The response was her head came up, she made eye contact, she smiled, I said "Do you remember that?" she said "yes." I was able to take her to the bathroom, I sang little songs to her … she was compliant, I was able to get her on the toilet. (Participant 4)

> We have a guy who … is very disruptive, clapping hands, attention seeking … But we had an Andre Rieu DVD on … he was watching it and when the audience clapped, he clapped. When the audience didn't clap, he didn't. It was able to redirect his disruptive behaviour into a positive behaviour at the appropriate time and place. (Participant 4)

In some instances, these changes were limited to the duration of the music listening time. However, in other instances, changes were more prolonged.

Benefits: social interactions/connectedness. The ability of music to bring about a sense of interconnectedness between residents was also recognized:

> We have a group of ladies, I call them my dancing ladies, they like to get up and dance together. We are quite high care here so we have to be careful about falls and that, like I have to be there to make sure no one falls over. But they will get up and dance and talking to each other in all their different languages and singing, not understanding each other but having a great time. (Participant 1)

In addition, it was noted that music was able to facilitate reminiscing, creating experiences of connection with events and people from the past. In some instances, this could be an individual pursuit, while in others it was identified as an experience that could be shared with others:

> We have one gentleman who does his own sing-along to the music because it's reminiscent of his time with his wife. (Participant 5)

> And with the (loud)speaker system, maybe two residents in a social setting might want to listen to each other's iPod's and reminisce on their kind of history together. (Participant 3)

Benefits: physical and cognitive changes. One interviewee noted that when residents dance to music, they seemed much more physically stable than they usually were. Another participant observed increased verbal communication in otherwise unresponsive residents:

> There was a resident who had just had a stroke and was basically non-responsive, so I started singing her her favourite song "As Time Goes By" and she actually started to turn her head and started singing along. She regained some speech after that. (Participant 2)

Negative responses. Despite the heavy emphasis given to the benefits of music, interviewees identified a range of instances in which residents responded negatively to music. In some instances, these negative reactions reflected *disinterest or an active dislike* of the music. For example,

> Depends on the person really and maybe how much music meant to them in their lives. I've got one person who I'll say "do you want to listen to music" and they'll say "no no I don't like music." (Participant 3)

> There are those who if they really don't like that typical style they will get up and walk out. (Participant 4)

In other instances, negative reactions were more pronounced and reflected *distress and other negative emotions*:

Yeah, sometimes [music listening] can cause more agitation and sometimes it can cause strong emotional responses, like crying. (Participant 3)

It definitely reminds me of the other Arabic lady, I don't play her as much music. Like I've tried playing her some French music as well but it just seems to upset her. (Participant 4)

One participant noted that particularly in group settings, music can sometimes be a bit "overloading" or *overstimulating*. However, participants did not always believe that a negative reaction meant that music use should be discontinued:

So I don't stop completely. I'll stop it on the day if I can see they are distressed and I'll try again and they'll be fine the next time. (Participant 1)

Yeah, I think that it's a good thing [to cry]. (Participant 1)

One participant commented that it can be

hard to know if they are crying because it's reminding them of a good thing or of a bad thing, so if they cry quite a bit I will stop but then I can play them the music the same song another time and get a different reaction. (Participant 3)

Nevertheless, one participant in particular was adamant that music was always effective and that "everyone likes music" (Participant 5).

Factors contributing to responses. Participants largely agreed that live music and interactive engagement with music in group settings provided the most benefit to residents. Participants noted that when observing live performances people were "more likely to be tapping their feet" and that in interactive group situations such as sing-alongs, "it becomes more of a social thing" with even residents who are usually withdrawn becoming increasingly interactive with staff and other residents. One participant reported having phased out performers who "just sit and play the piano," since residents seem to

respond better to performers who talk and laugh with residents, getting them involved. Nevertheless, participants agreed that individual music listening and even group listening to prerecorded music still held some benefits.

Timing of music use was also important. One participant noted that playing music at dinnertime was particularly useful because residents can tend to become agitated at that time. In addition, while some residents might not mind listening to the same music over and over, other people may complain about hearing the same music too frequently. Other factors were the use of acoustic instruments rather than electronic instruments, with one participant noting that music therapy sessions seemed to sometimes increase agitation when the therapist used an electronic keyboard. One participant also reported that some residents were reluctant to be involved in music therapy since they associated its use with people with severe cognitive impairment and felt insulted when invited to participate.

One participant noted that people with different kinds of dementia may be prone to different response to music as well, saying that people with Alzheimer's may be fairly stable in their responses to music over time, while people with vascular dementia might have "a sudden shift," tending to "respond to [songs] differently" on different occasions. In addition, it was noted by some that as dementia became more advanced music could begin to lose its soothing effect.

It was also commonly noted that people from different cultural backgrounds need to have music from their home country, and even a specific region within their home country, since "there's no point playing music that they're not going to get any meaning out of" (Participant 3).

Barriers to music use. The primary barrier to music use identified by participants in this study was the high cost of hiring music therapists or music performers and a lack of funding to do so. Participants reported that their facilities could only afford to hire performers once or twice a month and that they often had only one or two iPods for use in an entire facility:

We pay for our entertainers but there is only so much money for that … there is a company who in the past have supplied headphones and iPods to two of our residents who had behavioural issues but for the other residents who just enjoy music a lot, they don't come under that. It would be good if we could do it for everyone … but it's still so costly you know. (Participant 3)

A lack of variety among available performers and even in the techniques used by music therapists were also a problem according to some participants:

I'd like to have more variety of entertainers. (Participant 3)

With the music therapists, it's kind of like the same thing over and over. Same with the musicians that work here. It's been the same thing for like 20 years. (Participant 5)

Another barrier to the implementation of music use was the fact that many residents are "unable to self-initiate anything" and therefore need staff to encourage them to attend events or put their music on. However, often other staff were "not on board" and did not appear to perceive the value of musical activities, thus failing to provide support for individual engagement. Participants expressed the need for further training by staff or to have teams of volunteers available to facilitate more extensive musical engagement. However, as noted by one participant, volunteers with musical training are difficult to source:

Sometimes it's really difficult to get staff to actually participate in bringing residents to things … if I had a team of volunteers or something that would make life a lot easier. Because then they could be my hands and feet, but I don't … (Participant 3)

Personalized music listening was also problematic because of the difficulty of obtaining specific information about an individual's likes and dislikes. Often residents themselves are unable to recall particular songs or artists that

they like, and family members may also be unable to give comprehensive information:

Even family members, it's hard to get detailed information as to what precisely and exactly they like. It's very general … trying to pinpoint something, it's very general and broad. (Participant 5)

One participant reported overcoming this by having a book of 100 songs that was used to spark memories in residents, while other participants said that sometimes it was just trial and error.

Discussion

This mixed-methods study explored how music is used in aged care facilities in Sydney, Australia; factors contributing to its effectiveness or ineffectiveness; and barriers toward further use of music interventions in aged care settings. Both the qualitative and quantitative data confirmed that group activities are common in aged care facilities in Australia. Live performances from visiting musicians were the most consistently reported form of musical engagement across facilities. However, interviewees reported that budgetary constraints made it impossible to do this as often as desired, that many performers did not interact with the residents, and that not enough variety of performance was available.

Sing-alongs facilitated by staff were also frequently used. These forms of group activities appeared to have significant benefits to residents, increasing both social engagement and alertness. Given their low cost, sing-alongs provide a useful alternative to visits from professional musicians, which appear to be highly enjoyable to residents. Participants reported that sing-alongs were particularly beneficial where someone with musical training was on staff or if musically trained volunteers were available to lead sessions, although such volunteers can be difficult to obtain.

Although live performances and sing-alongs were the types of musical engagement most frequently observed in our sample of aged care facilities, empirical research has not always supported claims as to their benefits. One study, for example, compared the use of a 40-minute live group music program involving both listening and singing with a reading control group (Cooke et al., 2010a). No significant effect on agitation or anxiety was found in either group, with verbal aggression actually increasing over time in both groups. A second study by the same authors found decreased depressive symptoms in both a group exposed to live music sessions and a reading group (Cooke et al., 2010b). It appears that while residents may demonstrate increased engagement during such live music activities, any effects on psychological and behavioral symptoms are short-lived and not necessarily better than engaging in other pleasurable activities (Holmes et al., 2006).

Despite the evidence that communal consumption of prerecorded music is one of the least effective forms of musical engagement for residents of aged care facilities (Garrido et al., 2017), participants still reported a high frequency of use. Some benefits were reported by participants in our study, including reductions in problem behavior and improved mood. However, benefits tended to be less consistent than for other types of musical engagement, and increases in agitation among some residents were also reported as has been noted in previous studies (Nair et al., 2011; Park and Specht, 2009). Some facilities also reported individualized uses of music, but this was not possible in all facilities or for all residents given the lack of access to individual music players and budget for obtaining such items.

Music therapy was the least utilized form of music intervention. Interview participants reported mixed levels of enthusiasm for music therapy, with some participants stating that funding making it more widely available would be ideal. Others reported that music therapists tended to use instruments that residents did not like, to use the same music or same techniques without variation, or that there was a certain stigma attached to music therapy by residents.

Some facilities also reported having musical instruments such as pianos available for use by residents. Given the evidence suggesting that learning an instrument can both increase cognitive performance and improve mood in older adults (Seinfeld et al., 2013), this may be an avenue for musical engagement that could be further utilized in aged care facilities.

Participants were able to provide a number of insights into situations that can increase or decrease the effectiveness of music interventions. All participants identified times when music had been ineffective or resulted in adverse reactions. However, they gave less weighting to these experiences than to positive reactions, and some participants reported beliefs that music was "always effective" or that "everyone likes music." This is an interesting finding because it may indicate a tendency to focus on positive experiences while discounting instances where music has increased agitation or caused distress. Studies into music use in other populations have found similar effects, with both consumers and researchers often being biased by a belief in the universally positive nature of music despite considerable evidence of its potential for negative impact in some situations (McFerran et al., 2016). In the case of healthcare workers, this bias could be exacerbated by exaggerated media reports of music's effect on people with dementia, which creates a distorted lens through which musical experiences are viewed. Such unbalanced viewpoints of the benefits of music could result in the misdirection of valuable resources toward activities for which there is little evidence of benefit, as well as aged care staff being unprepared for potentially adverse reactions.

Among the most frequently noted problems were music that was too loud, too repetitive, or that triggered distressing memories. However, participants observed that it was not always necessary to give up on music use when a resident became distressed. Rather, it could be beneficial to try again at another time, or if the negative response was not too severe, to allow residents the opportunity to experience catharsis and emotional arousal. As noted by one participant

in particular, people with some forms of dementia such as vascular dementia may be more prone to variable responses to the music. While these differences have not been empirically tested at this stage, given the behavioral differences between the various types of dementia (Cerejeira et al., 2012), it is not unexpected that responses to music may differ between patients with different dementia sub-types. It was also noted that when people were already agitated, music was often not enough to soothe them, suggesting the need to use music prior to the onset of symptoms as has been previously recommended in the literature (Gerdner, 2012).

The primary barriers reported by participants to more extensive use of music in aged care facilities were a lack of resources and the costs associated. However, it appears that staff members try to mediate this by creating new opportunities to include music via low-cost options. Participants described using a number of staff-initiated musical activities as well as volunteers to work around limited resources and funding. Studies in the use of other arts programs have also suggested that implementation of such programs can be improved by modifying activities so that people with dementia can engage in them autonomously and independently (Mihailidis et al., 2010). It may be that implementing technology such as iPods for playing personalized playlists may help contribute to the cost-effective use of music where staff time and funding for live performances or music therapists are in short supply.

Difficulty sourcing information about music preferences was an additional barrier noted by participants who were aware of the benefits of personalizing music programs. However, other participants suggested strategies for overcoming this impediment, such as creating a book of popular songs from relevant eras from which to allow participants to select. This further suggests the need for increased education and training, as well as standardized protocols for music use in aged care facilities. A lack of knowledge about the value of music as well as specialized knowledge about how to use it was evident from the current study. Participants noted the need for increased training among staff about the benefits

of music-based interventions to gain the support of staff in implementing musical interventions. However, this study also revealed that the ways staff are using music in aged care facilities are not necessarily based on evidence of best practice. This further highlights the need to enlist the support of end-users in the development and implementation of music interventions, and to integrate knowledge about the use of music with education and training.

This study is limited by the fact that there may have been some response-bias. In particular, participants appeared to be mostly enthusiastic about the use of music in aged care, and this may not be reflective of general viewpoints among aged care workers. However, overall, the study demonstrates that there is considerable eagerness to use music among some carers in aged care facilities. Limited resources, knowledge, and training means that music is not always used as effectively as it could be. Future interventions will need to consider cost-effectiveness as well as ensure that plans for knowledge dissemination and training are built into the intervention design. Furthermore, the study indicates that the development of standardized protocols for the use of music could increase the effectiveness of musical engagement in aged care settings by providing workers in the field with greater knowledge and guidelines for evidence-based practices.

Supplemental Material

Declaration of Conflicting Interests

Funding

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