



The Music Engagement Program for people with Alzheimer's disease and dementia: Pilot feasibility trial outcomes

Amelia Gulliver^{a,*}, Georgia Pike^a, Michelle Banfield^a, Alyssa R. Morse^a, Natasha Katruss^a, Harley Valerius^b, Melanie Pescud^c, Mitchell McMaster^d, Susan West^e

^a Centre for Mental Health Research, Research School of Population Health, The Australian National University, Building 63 Eggleston Road, Acton, Canberra, ACT, 2601, Australia

^b Noah's Ark Inc., 2/6 Farr Pl, Isaacs ACT 2607, Canberra, Australia

^c Menzies Centre for Health Governance, School of Regulation and Global Governance (RegNet), College of Asia and the Pacific, The Australian National University, Coombs Extension Building (no 8), Fellows Road, Acton, Canberra, ACT, 2601, Australia

^d Centre for Research on Ageing, Health, and Wellbeing, Research School of Population Health, The Australian National University, Florey Building 54, Mills Road, Acton, Canberra, ACT, 2601, Australia

^e School of Education / School of Theology, Charles Sturt University, 15 Blackall Street, Barton, Canberra, ACT, 2600, Australia

ARTICLE INFO

Keywords:

Alzheimer's disease
Dementia
Depression
Music
Feasibility
Intervention

ABSTRACT

Alzheimer's disease and dementia are common, highly disabling conditions frequently requiring residential care. This exploratory proof-of-concept study aimed to determine if the specialised Music Engagement Program (MEP) was sustainable, acceptable, and effective in improving quality of life, emotional wellbeing, and depression symptoms in this population. Sixteen residents, six staff members, and three family and community members took part in the evaluation of the MEP for people living with dementia in a residential aged-care nursing home in Canberra, Australia. Multiple methods were used. Quantitative evaluation assessed residents' depression symptoms (Cornell scale) at pre- and post-intervention, and emotional wellbeing pre- and post-session. Qualitative interviews with staff, and family and community members addressed the MEP's acceptability and potential sustainability. Results showed residents' mean depression scores were reduced from pre- to post-intervention ($p = .039$; $d_z = 0.72$). Interviews established multiple benefits for residents including improved mood, calmness, and reduced aggression. However, staff did not believe it was feasible to continue the MEP sessions beyond the trial period without an external facilitator, citing potential difficulties in adhering to internal activities due to time constraints. This pilot study provides encouraging preliminary evidence for the MEP's acceptability and potential effectiveness for improving depression and wellbeing in this group.

1. Introduction

Alzheimer's disease and dementia are common; 50 million people around the world currently live with these conditions (Alzheimer's Disease International, 2018). Global prevalence continues to increase rapidly (Prince et al., 2013) and by the year 2050, nearly 152 million people will be living with Alzheimer's disease and dementia (Alzheimer's Disease International, 2018). These conditions are highly disabling, and severely affect all aspects of an individual's life including social relationships, wellbeing, mental health, and physical functioning (Ridder & Gummessen, 2015). People with Alzheimer's disease and dementia experience progressive and degenerative cognitive deficits

impacting on brain function including on language and memory (McKhann et al., 2011). Their ability to communicate becomes greatly impacted, leading to isolation and loneliness (Ridder & Gummessen, 2015), and lowered quality of life and overall health (Politis et al., 2004).

Nearly half of people with Alzheimer's disease and dementia experience symptoms of depression (Modrego, 2010); those living in aged-care residential facilities are at even greater risk of poor mental health (McCabe et al., 2013). In addition, behavioural and psychological symptoms of dementia include physical or verbal aggression and agitation, psychosis, wandering, emotional distress, and apathy (Trivedi et al., 2018). The symptoms of dementia can also have an impact on

Abbreviations: MEP, Music Engagement Program; ANU, Australian National University; PAS, Psychogeriatric Assessment Scales.

* Corresponding author.

E-mail address: amelia.gulliver@anu.edu.au (A. Gulliver).

<https://doi.org/10.1016/j.evalprogplan.2021.101930>

Received 14 February 2020; Received in revised form 11 January 2021; Accepted 28 February 2021

Available online 3 March 2021

0149-7189/© 2021 The Authors.

Published by Elsevier Ltd.

This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

engagement in meaningful occupation including activities of daily living (e.g., eating, bathing), leading to high dependence on others. Managing the symptoms of dementia can be challenging for residential aged-care home staff; however, significant adverse outcomes can occur if residents are not well-supported. These include problems for the residents themselves such as increased rates of falls, use of physical or medical restraints, and social isolation, as well as consequences for the staff, including burnout (Davison, Hudgson, McCabe, George, & Buchanan, 2007; McCabe, Davison, & George, 2007) and compassion fatigue (Nolte, Downing, Temane, & Hastings-Tolsma, 2017).

Despite losing many cognitive abilities including those that govern communication, the ability to respond to music is often preserved even in later stages of dementia (Baird & Samson, 2015). Thus, the use of music as therapy in this group is highly appropriate. Therapy utilising music has demonstrated reduced symptoms of depression and anxiety (McDermott, Crellin, Ridder, & Orrell, 2013), agitation (Livingston et al., 2014) and apathy (Goris, Ansel, & Schutte, 2016) in people with dementia. However, as noted by van der Steen et al. (2017) previous studies on the effect of music therapy have not examined other potential positive outcomes, such as overall quality of life, social outcomes, and wellbeing.

Significant cost is involved in the delivery of music therapy, including paying professional music therapists. Thus, there remains a lack of cost-effective, evidence-based programs that have capacity to be broadly applied and sustained in the community. Interventions such as listening to music on headphones or speakers in part address cost issues (Garrido et al., 2017). However, active group music participation can also encourage social engagement (Leggieri et al., 2019) which is a basic human need (Koelsch, 2014). Research indicates that the effect of group music therapy is likely attributable in part to the social interaction during the session (Baird & Samson, 2015) and family members believe that social interaction is critical to the emotional wellbeing of people with dementia (McDermott, Orrell, & Ridder, 2014).

The fundamental principles behind the Music Engagement Program (MEP) are those of shared and social altruistic music-making (West, 2009b). The MEP requires no musical instruments or equipment, and staff can be trained in the specialised techniques at low cost. The program was developed by leading researchers at the Australian National University (ANU) School of Music (West, 2009b). The current study is the first research trial of the MEP conducted in a residential aged-care population. There remains an urgent need to develop cost-effective, acceptable, and safe treatments that have potential to improve quality of life, social outcomes, as well as decrease symptoms of mental health problems. This study sought to address this gap.

1.1. Aims

The project aimed to evaluate the effectiveness of the MEP, a specialised music program, in improving quality of life, emotional wellbeing, and depression in aged-care residents with Alzheimer's disease and dementia. The study also aimed to determine the acceptability, feasibility, and sustainability of the MEP in a residential aged-care setting.

2. Methods

This paper adheres to the CONSORT 2010 checklist of information to include when reporting a pilot or feasibility trial (Eldridge et al., 2016). Appendix A in Supplementary materials presents the CONSORT checklist.

2.1. Ethics approval

The ethical aspects of this research were approved by The Australian National University Human Research Ethics Committee (ANU HREC 2018/645).

2.2. Participants

Participants were 16 residents, six staff, and three family and community members. Table 1 displays the participant characteristics. Due to the small sample and local study location, few demographic data were collected to minimise the risk of individuals being identified. These data, obtained from the residential care home, included age and gender, and the Psychogeriatric Assessment Scale (PAS). To be eligible, residents were required to be living with advanced Alzheimer's disease or dementia and currently residing at the secure, privately owned residential aged-care nursing home in Canberra, Australia, which caters for a maximum of 20 residents. The staff participants were employed at the residential care home as nurses or managers; they did not have to be directly involved in facilitating the delivery of the MEP. Almost all residents had PAS scores of 16–21, indicating severe cognitive impairment and requiring full assistance with most or all activities of daily living.

2.3. Recruitment

2.3.1. Residents

Recruitment of the 16 residents who participated in the study was conducted by the residential care home staff in early 2019. The consent process involved seeking agreement to participate from both residents and family members. First, invitations were sent by the residential care home via email to the family members of residents, including information and consent forms for participation in the research. Consent forms were then collected by the residential care home staff. Some were provided by email, whilst others provided consent on paper in-person. Assent to participate from the residents themselves was also sought by the researchers. In the first session, a researcher (author AG) verbally explained the study to all residents who had consent provided by their family members. The researcher explained the key points of the study, required for deciding to participate in a research study (Resnick et al., 2007). Two researchers (AG and NK) then went around to each potential participant and asked individually if they agreed to participate. Each resident's assent/dissent to participate was recorded, and subsequently their first pre-session survey on their current perception of their own feelings of emotional wellbeing and social connection was conducted. Any residents whose families or themselves did not wish to participate in the research were still able to take part in the music program independently of the research component. Of the 19 people in the residential care home at the time, 16 (84 %) agreed to participate in the research study. At the beginning of each session, the researchers asked each participant if they wanted to participate in the current session, prior to recording pre-session data. To reduce the burden on participants, dementia severity data that was previously collected on intake by the residential care home staff was used to provide a summary of the group.

2.3.2. Staff and family and community members

After the conclusion of the 8-week intervention, the research team

Table 1
Participant characteristics.

Participant group	n	Male n (%)	Female n (%)	Missing n (%)	Age in years (M, SD, Range)
Staff	6	0 (0.0)	6 (100.0)	–	–
Family and community members	3	2 (66.7)	1 (33.3)	–	–
Residents	16	9 (56.3)	6 (37.5)	1 (6.3)	80.8 (9.57) 64 – 97 years
Total N	25	11 (44.0)	13 (52.0)	1 (4.0)	–

invited the residential care home staff to participate in a face-to-face interview with a researcher (NK). In addition, family members of residents who were participating were sent an invitation for an interview to discuss the program. A member of the broader residential aged care community not related to the residents attended the sessions voluntarily, and this person also offered to provide their feedback on the program in an interview. All interviewees provided written or verbal consent to the researcher on the day prior to discussing their experiences with the delivery of the program at a mutually convenient time during April to June 2019.

2.4. Intervention

2.4.1. The Music Engagement Program (MEP)

The MEP is a long-established program that aims to increase engagement and participation in the act of music-making for wellbeing (Pike, 2016; West, 2009a). The MEP's approach stemmed from the philosophies of an Australian medical doctor and philosopher, Dr John Diamond (Pike, 2016). The MEP fosters an approach to music where participants of all ages, abilities and skill levels become co-facilitators of others' music making. In the context of residential aged care, a typical MEP outreach-singing event involves participating in group singing sessions led by a facilitator, with or without simple accompaniment. A critical difference between the MEP and other music programs, is that its unique approach is highly interactive, focusing on shared, active music-making with the intent of altruistically reaching out to others (West, 2009b). For the current project, the MEP facilitator (GP) explicitly selected songs that would be familiar to residents, considering their age and cultural background. During sessions, the facilitator would verbally ask residents for any musical requests and would select these songs for the group to sing. Residents were also encouraged to lead songs in an increasing capacity over time. The goal of the program was to facilitate social interaction, singing and group participation between residents, staff, visiting family members, and the music facilitator. These social outcomes were the focus of the program; thus, techniques such as close personal physical and eye contact were used to help encourage individual engagement within a group singing situation. In addition, rather than a performer/audience dynamic, the facilitator and additional participants and volunteers moved about the space amongst the residents, encouraging one-on-one interaction. Residents were also encouraged to interact with each other.

2.4.1.1. Procedure. The intervention comprised eight weekly group singing MEP sessions delivered during February to March 2019 at a secure dementia unit in a residential aged-care nursing home in Canberra, Australia. Sessions were 45–60 min long and were led by a highly experienced music facilitator (author X3). Researchers AG and/or NK were present during sessions and to conduct resident pre- and post-session measures. Researchers (AG, NK, SW) also participated in the group singing during many of the sessions. It was intended that the staff employed at the residential care home would be encouraged to lead songs and sing in an increasing capacity over the 8 weeks, in order to encourage communal facilitation rather than reliance on an external musician (Gulliver et al., 2019). However, staff participation was generally minimal, and most staff instead tended to maintain their regular duties during this time. The researchers ensured during sessions there was at least one familiar residential care home staff member available to assist in mitigating any potential resident distress. For several residents, the music would induce strong emotions and memories. For one participant in particular, certain songs would elicit strong emotions and memories of past experiences, and the participant would cry. In this instance, the researchers sought the advice of the resident in question, staff members, and, where possible, a family member. Based on this advice from these sources, the emotion was deemed to be cathartic, and the resident expressing these emotions chose to remain in

the room when asked if they wished to stay.

2.4.1.2. Setting. The space available for the MEP delivery was a large rectangular lounge room. Comfortable chairs and lounges were set up along one side, with a thoroughfare available for access to the kitchen, residents' rooms (some of which opened out to the lounge space), and other areas of the residential care home.

2.4.1.3. Song selection. In the initial session, songs were selected from those most frequently requested in similar settings run by the MEP. The MEP facilitator had prior experience singing at this particular care facility, though singing had not taken place there for over 12 months. Spanning over 100 years of musical history, the songs regularly requested by residents at this home included 'The Road to Gundagai' (1922), 'Too Young' (1951), 'The Bonnie Banks o' Loch Lomond' (1841) and 'That's Amore' (1953). Appendix B in Supplementary materials provides a detailed song list.

2.5. Evaluation design

The evaluation was designed to be exploratory [see study protocol (Gulliver et al., 2019)], and examine the effectiveness of the program from various viewpoints using both qualitative and quantitative data collection from the residents, family and community members, and residential care home staff. Although it was not explicitly designed using a specific evaluation framework, the current evaluation most fits with theory-driven evaluation using a summative approach (Chen, 2012). This is because it was focused on collective evidence to determine not only whether the intervention worked, but also how and why it may work, with the inclusion of key stakeholders' perspectives. The evaluation involved pre- and post-session, and pre- and post-intervention (8 weeks) quantitative data collection from a single cohort of participants. Additionally, qualitative interviews with family and community members and the residential care home staff were conducted to examine their views on the impact of the program for the residents, as well as its potential sustainability in the setting. Fig. 1 demonstrates the trial flow for the quantitative evaluation of the residents' participation in the study. Almost all residents ($n = 14$) attended at least half of the sessions (Range = 2–8 sessions, $M = 5.88$, $SD = 1.96$). Reasons for not attending MEP sessions were not formally recorded; however, the researchers observed that these varied, including expressing desire not to attend, or participating in other activities at the time of the session (e.g., sleeping, eating, or engaging with visitors).

2.5.1. Pre- and post-session resident evaluation

A visual analogue survey based on the WONCA charts for "Feelings" and "Social Activities" (Lennon, Carey, Creed, Durcan, & Blake, 2011) was used to measure immediate pre- and post-session emotional wellbeing and social connectedness. Appendix C in Supplementary materials presents the modified WONCA chart. Research demonstrates adequate reliability and validity of the original WONCA charts in populations with vision or language impairments (Lennon et al., 2011), and in people with dementia and with residential care-home residents (Aspden, Bradshaw, Playford, & Riaz, 2014; Ettema et al., 2007). The chart can be used both visually and verbally, as each possible response on the chart is illustrated by a drawing that depicts a level of functioning or wellbeing along a 5-point ordinal scale. The timeframe was modified from the original "During the past 2 weeks..." to "At this moment", to lessen confusion in the residents due to likely temporal issues, and to capture any changes that may occur after each MEP session. The language was similarly simplified, residents were asked "At this moment... how emotionally well do you feel?" and "how social or connected with other people do you feel?" The scale ranges through *not at all* (1), *slightly* (2), *moderately* (3), *quite a bit* (4), to *extremely* (5). For the emotional wellbeing scale, each descriptive word is matched with a picture of a cartoon

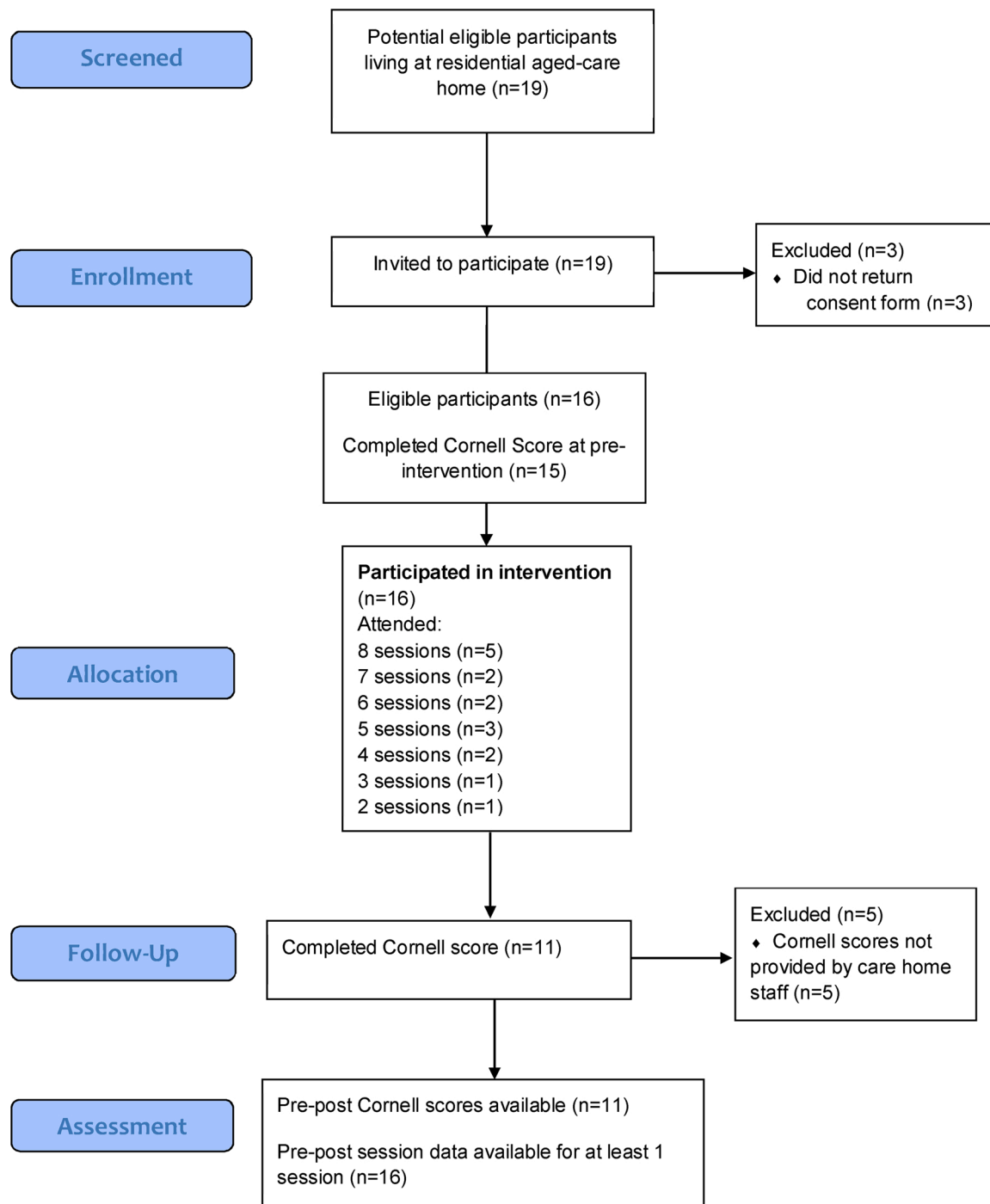


Fig. 1. Trial flow chart.

face frowning (1) to one of that smiling broadly (5); for the social connectedness scale, the pictures are of a person on their own, set apart from a group of stick-figure people (1) to one where the person is integrated within the group of people (5). At the ethics committee's request (ANU HREC 2018/645), the smile on the face of the individual stick figure in the social connectedness scale was also removed due to the committee's concerns that the correlation between social connectedness and happiness may not resonate with some people.

The researchers asked the question out loud, and then pointed to the pictures to assist residents to either verbalise or point to the picture they identified with at that time. The emotional wellbeing concept was relatively well understood, with many participants even expressing that

they 'felt better' after the session indicating they understood what was being asked. However, the concept of social connectedness using the modified WONCA chart was difficult to convey; thus to avoid participant distress or the collection of invalid data, the social connectedness measure was discontinued after the second session. The modified chart with the lack of a smiling face contributed to this difficulty in communicating; although, it is also possible that the concept of social connectedness may have been too abstract.

2.5.2. Pre- and post-intervention observational resident evaluation

Pre- and post-intervention observational surveys of residents' symptoms of depression was conducted by two residential care home

staff members. The proxy survey comprised the Cornell Scale for Depression in Dementia (Alexopoulos, Abrams, Young, & Shamoian, 1988); a scale that has been validated in multiple dementia populations including residential care homes (Jeon et al., 2015; Korner et al., 2006; Portugal et al., 2012; Wongpakaran & Wongpakaran, 2013). The staff were familiar with the scale, completing it for a separate purpose at the residential care home prior to the current study. The Cornell Scale measures multiple indicators of depression and provides an indication of quality of life through measuring factors of *mood-related signs* (including anxiety, irritability), *behavioural disturbances* (agitation, retardation), *physical signs* (loss of appetite, tiredness), *cyclic functions* (difficulty falling asleep, symptoms worse in morning), and *ideational disturbances* (suicidal tendencies, pessimism). The Cornell Scale measures 19 items evaluating the individual's symptoms of depression and related general wellbeing items (e.g., anxiety, appetite, agitation) on a 3-point scale where the symptoms are *absent* (0), *mild or intermittent* (1), *severe* (2), or *unable to evaluate* (a) as assessed during the past week. Items are summed to obtain subscale and total summary scores. A score above 10 signifies probable major depression. Completed Cornell Scale measures were obtained from staff for 15 of the 16 consenting residents (93.8 %) at pre-intervention, and for 11 of 16 (68.8 %) at post-intervention. The researchers telephoned the residential aged-care home and sent emails to remind staff to provide the completed Cornell measures; however, a completed scale for one resident at pre-intervention was not received prior to the intervention, and for five residents at post-intervention. After one-month post-intervention it was decided to abandon the collection of Cornell scores for the remaining five residents as they would no longer be valid.

Observational data (note-taking) were also collected at each session by the trial manager (NK) on the interaction between participants and which residents attended each session. Observations were also made by the researchers who attended and/or led the sessions (AG, NK, GP). Notes were not taken on residents who were not participating in the research.

2.5.3. Staff, family and community member interviews

Appendix D in Supplementary materials presents the interview questions for staff, and family and community members, which followed a semi-structured protocol (Low, 2013). Staff interviews were conducted in a private room on site, and family and community member interviews were conducted on-site, or via telephone. With written (face-to-face) or verbal (telephone) consent, interviews were recorded for accuracy. They were later transcribed by an external transcription company and subsequently de-identified. Interviews were conducted after the 8-week intervention period. Staff were invited to discuss the benefits and challenges of the MEP, their experiences with the program, and any barriers or enablers to staff continuing the program without the music facilitator present. Family and community member interviews focused on observable benefits and potential negative consequences of the program.

Table 2 shows the assessments and time points for the study.

Table 2
Assessment time points.

Construct	Measure	Residential care home data (prior to study)	Pre-intervention (before week 1)	Pre-session (weeks 1–8)	Post-session (weeks 1–8)	Post-intervention (after week 8)
Depression symptoms	Cornell Scale		✓			✓
Emotional wellbeing (current 'mood')	Visual analogue (WONCA chart)			✓	✓	
Social connectedness	Visual analogue (WONCA chart)			✓	✓	
Demographic data	N/A	✓				
Dementia severity	Psychogeriatric Assessment Scales (PAS)	✓				
Experience of program (staff)	Interview					✓
Experience of program (family and community members)	Interview					✓

2.6. Analysis strategy

Quantitative data analyses were conducted using SPSS (Statistical Package for the Social Sciences, IBM Corp, 2016). Data on resident participant outcomes were analysed using a paired samples *t*-test to test for differences before and after completing the program for depression symptoms. A paired sample *t*-test was also conducted for before and after each session for emotional wellbeing. A correction for multiple testing was not applied ($p < .05$) as this was an exploratory study (Twisk, 2003). The quantity of missing data precluded a multi-level modelling analysis of the changes over time in emotional wellbeing. Cohen's d_z effect sizes were used to evaluate the strength of the effects for depression symptoms given the small sample size and taking into account within-participant correlations over time (Lakens, 2013).

Thematic analysis (Braun & Clarke, 2006) was used by the first author (AG) to group key concepts from interviews and notes into themes. For the qualitative analysis, due to the very specific areas of interest for the evaluation, a primarily deductive approach was taken using the structured interview questions to examine themes of interest. However, both inductive and deductive manual coding was utilised to identify key topics and themes arising from the evaluation. Inductive coding was primarily used for the for family and community member interviews (example theme - "Lucidity") and deductive was primarily used for the staff interviews as there were specific questions regarding the barriers to program implementation and sustainability (example theme - "Benefits of the program"). The coding structure was confirmed via verbal discussion with the research team members who were involved in the qualitative part of the study, either by providing analysis expertise (MB, ARM), or conducting the interviews (NK).

2.7. Incentives

Small gifts were provided in appreciation for participants' time and effort. Staff, and family and community members were provided with an AUD\$50 gift card for their participation in the interviews. The researchers originally planned to provide all residents, including those who did not participate in the research, a compact disc of the music from the MEP; however, copyright issues prevented this from occurring. Instead, given that staff asked if any further sessions were possible, the lead music facilitator (GP) and several of the researchers involved in the project (AG, NK, SW) elected to continue to provide MEP sessions on a voluntary semi-regular basis throughout the remainder of 2019 to thank residents and staff for their participation in the study.

3. Results

3.1. Participant codes

Participant codes are as follows: S1=Staff participant 1; F1=Family and community member participant 1. Given that there were only two family members and one community member, these data were pooled to

protect participants' identities.

3.2. Resident evaluation

3.2.1. Depression

There was a reduction in participants' depression (Cornell scale) scores from pre- ($M = 9.53$, $SD = 3.60$) to post-intervention ($M = 5.27$, $SD = 3.61$), indicating an improvement in overall depression symptoms, $t(10) = 2.38$, $p = .039$. The overall Cohen's d_z effect size was 0.72.

Further t-tests were also calculated for subscales, indicating the change was only significant for the cyclic function subscale: *cyclic functions* $t(10) = 2.61$, $p = .026$, $d_z = 0.79$, *mood-related signs* $t(10) = 2.11$, $p = .061$; $d_z = 0.63$ and *behavioural disturbances* $t(10) = 0.38$, $p = .714$; $d_z = 0.11$. Calculations were not conducted for ideational disturbances and physical signs as residential care home staff members selected "unable to rate" for most subscale items at pre-intervention.

3.2.2. Emotional wellbeing

Fig. 2 shows the participants' self-assessed improvement in emotional wellbeing for session 1, $t(8) = -2.49$, $p = .038$, session 6, $t(8) = -3.02$, $p = .016$, and session 8, $t(5) = -2.74$, $p = .041$. Other session emotional wellbeing means remained stable from pre to post-session.

3.3. Interviews

The qualitative comments about the program from the interviews were coded into themes and are presented below as a summary for each group: family and community members, followed by the residential care home staff evaluation.

3.3.1. Family and community members evaluation

Overall, the family and community members ($n=3$) were all highly complimentary of the program, reporting that they were satisfied with their own and their family member's participation. The family and community members were unable to identify any negative consequences of the program. All family and community members attended at least one session, with two attending nearly all ($n=7$) sessions and provided their observations from this experience.

3.3.1.1. Social nature of the program. The family and community members all believed the program was beneficial to the residential care home. They particularly noted their family members liked the social aspects of the program – "just being acknowledged and the interaction with someone, with others...participating in something happy" (F1). One

remarked that their family member normally did not participate in singing programs as "he finds some of it a bit boring" (F2), but that this program was different. They believed that the social aspect of the program, particularly the personal interaction by the music facilitator, was what kept their family member interested – "he was drawn into it with so much ease because the singer was more involved with the people than normally someone just sitting at the front there" (F2). The communal, shared nature of the MEP singing was also noted "you don't have that pressure to be the entertainer...that pressure dissipates, it's like a shared burden" (F1).

3.3.1.2. Lucidity. Family and community members also remarked that the sessions appeared to improve the 'lucidity' of the residents – "just hearing her being able to sing right through a song. I haven't heard her sing a song right through for a long time." (F1). One thought that during some sessions the residents would be very engaged and present in the moment, describing how they observed the interaction between one of the other residents and their family member: "Usually she would be, what I would call 'in her own world'. Whereas...while the music was going on, she was truly with her daughter...Singing along, not so much in her own world." (F3). This resident's family member also described this profound effect for the resident (their mother) after sessions, saying that they felt:

She was a lot more coherent and able to have...a much more meaningful conversation...I was able to talk to her about things as though she was just a normal mother, like she didn't have dementia. You've got your mother back, you know? I mean, it might only be for five minutes or something, but you've got her back for that amount of time. (F1)

3.3.1.3. Music-making. The family and community members described how residents seemed to specifically enjoy the musical and singing aspects of the MEP. One remarked about their family member in the care home that they believed it reminded them of what they did when they were younger – "there was a lot more social activity when they were young, like in terms of more getting together for singalongs" (F1). Another participant remarked "Back in the 60s...dad was always singing at parties...around a piano" (F2). Although, one of the family and community members remarked that even though "the kind of songs that we're singing are not...my music" (F3) they were surprised that they genuinely enjoyed continuing to attend the sessions regardless.

3.3.1.4. Benefits to themselves. Family and community members described the benefits they felt themselves, either indirectly, through the benefits to their family member in care, or directly through improving their own mood – "it lifted my mood, because it's really hard to go and visit,

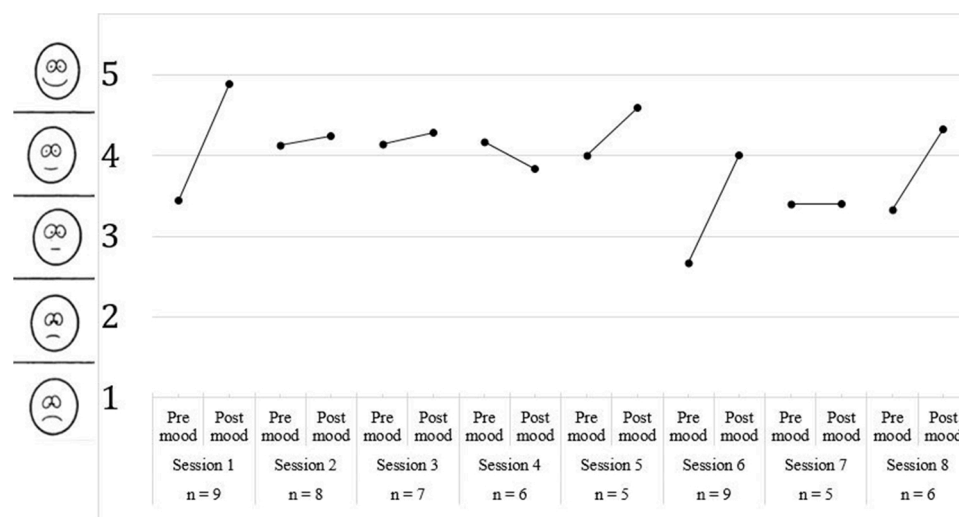


Fig. 2. Pre- and post-session emotional wellbeing (WONCA chart).

sometimes worse than others...and it just...lightened the load.” (F1). Another participant said they enjoyed joining in with the sessions themselves and noticed after one session they had “started whistling... it’s a sign of what I generally feel after each session...a certain uplift in spirit... because I am participating.” (F3).

3.3.1.5. Ongoing effects. Family and community members noted that the effects of the program occurred both prior to the sessions, and after the sessions – “She was just really happy when she was doing it, before and after” (F1). One of the participants commented that some of the lasting effects were the encouragement of people to continue to sing – “A week after, I went back and (a resident)...came out of his room...I said, ‘oh, you’re missing the singing today’. I said, ‘how about you get into a bit of a song’, and so he did.” (F1). Another believed the effects of the MEP did not influence their family member’s subsequent mood or behaviour – “he was just him’as he always is.” (F2). However, one of the other participants stated that they felt the positive effects of the MEP lasted, saying that “the next day yeah, I noticed quite a difference. And just a general sense of happiness, I thought her happiness levels just seemed to be lifted a lot more” (F1). This same participant also mentioned that this change in behaviour was noticed by another family member who was not aware this resident was attending MEP sessions – “My son with his fiancé, they dropped in to see Mum after...one of the music sessions...he said, Nana was in great form today...he’d got his grandmother back for a while” (F1).

3.3.2. Residential care home staff evaluation

Overwhelmingly, the staff ($n = 6$) all enjoyed the delivery of the MEP at the residential care home. All staff were present during the delivery of at least one MEP session, either assisting to bring residents in, or viewing the program while carrying out other duties.

3.3.2.1. Benefits of the program. The residential care home staff outlined several benefits of the program, primarily for the residents. These benefits were experienced before, during, and after the sessions.

Prior to the sessions, one staff member noted that it was useful for staff to tell the residents on the days when there were MEP sessions scheduled, as many residents would then be positively anticipating the session “we tell them that the group is coming at a certain time, some of the residents...they wait for that time to come” (S1). Another staff member observed that immediately prior to sessions the residents’ faces brightened “when you guys walked in, because they were in the space...they knew what was going to happen.” (S2).

During the sessions, staff mentioned that residents appeared to be enjoying themselves, noting physical cues to indicate this, such as singing “loudly, and laughing” (S3). One staff member noticed the change in one resident in particular; the resident “who does not often smile or... she was clapping her hands, holding her hands together, smiling” (S4). One staff member believed the benefits of the program were from multiple aspects of the program, citing the “inclusiveness, it’s the uplifting feel from music, it’s engagement, it’s being part of something.” (S2). This identification of the social and involving nature of the program was also noted by other staff members who said that when residents “see a lot of people around them...they feel very happy” (S1). Another staff member observed how residents’ behaviour changed dramatically during sessions:

Often when you walk into a space where those who are living with dementia are living, they’re oftentimes a little bit vacant...and distracted by other things. But when the music program was taking place...you could see how engaged they were and how much they were focusing on you all in the room...that really dynamic change...that level of engagement, was quite phenomenal to see. (S4)

This same staff member observed that the MEP seemed different to other music programs they had experienced in the past “I mean there’s been music therapy, but certainly not a program like that.” (S4). Some staff believed that the specifically curated music selection was useful –

“singing the old times songs really helps” (S2) as it “brings back memories” (S3).

The staff believed the improvements in residents’ behaviour lasted “on the day and continuously” (S5) with agitation and restlessness being replaced by a sense of calmness – “whether or not they were just tired, tucked out, perhaps; but certainly a sense of calmness” (S4) and “the verbal aggression disappeared for a while.” (S2). Additionally, there were no changes in negative observable behaviours following the sessions, one staff member stating that there was no “increased incontinence, or increased or decreased appetite, or anything like that”(S4). The staff also identified benefits of the MEP program for themselves saying they were excited about the program and “happy that the residents are having a good time” (S6). Another staff member said the program was “good” for everyone “when you are here, I mean the staff, the resident, the families” (S3).

3.3.2.2. Negative consequences of the program. Staff could not identify any negative consequences of the program for the residents or staff – “there was nothing negative. Because I did ask around to everybody, I asked homemakers, I asked care staff, I spoke to some of the GPs and said if they’d been told anything from family or anything. Nothing.”(S4). Of particular importance, this same staff member explained they expected to see a rise in behavioural altering (PRN or pro re nata “as needed”) medication to address any hyperstimulation they expected to occur, yet: “that didn’t happen at all and we didn’t have to use any PRN medication after that...I was really watching for that, just thinking, I would have thought that there would have been something that triggered some behaviours, but not at all.” (S4).

Several staff noted that there were some difficulties in terms of implementing the program. These included that sometimes it was hard to assemble the residents- “trying to get them there with about ten minutes to go, they all wander off again, and then you’ve got to go and get them” (S2). Additionally, the space that the MEP sessions were held in was a thoroughfare, but this was reported to be the only room that was available “the area is not good there anyway. It’s busy [but] they don’t have the area to take them away to a separate room,” (S2).

3.3.2.3. Issues in continuing the program. There were mixed views about whether staff could continue the program in the absence of an MEP facilitator. One staff member believed that since they already conducted musical sessions, they would not find it difficult – “one of the family member’s daughter, she plays the piano. And then we had another family member, the son plays the ukulele...they come in and we do the singing” (S5). Other staff were adamant that this would not be possible, suggesting staff may be “a little bit frightened of letting their voice out and... because it is a daunting thing” (S2), and that they felt you had to have “a good voice” (S3). Several staff members believed insufficient time was a significant barrier to conducting these types of activities – “No...they’re focused on getting their care work done...to do something like that you need someone that’s going to sit there with them” (S2). In addition to this, the fact that the program was scheduled by an external group meant it was less likely to be cancelled in favour of other higher priority duties:

What happens, unfortunately, like every workplace, you’ll have people off sick or someone takes holidays or something like that; why I find external help so wonderful is that I know that it’s set for that week, and it’s not going to change. (S4)

This was disappointing for this staff member because they believed that the MEP was so beneficial for both staff and residents.

3.3.3. Observations from facilitator and participant-researchers

The observations of the MEP facilitator and participating researchers aligned with the remarks made by family members and volunteers who participated in the sessions. The MEP facilitator noted that the speed at which the residents ‘warmed up’ and engaged in the singing each week increased, taking residents less time to participate within each session.

There was also some carry-over benefit noted by the researchers in the regularity of the sessions. Despite a week break between each session the residents remembered some aspects of the singing, were anticipating the sessions, and knew to engage and interact with the facilitators. Residents were observed helping each other, encouraging each other to sing, interact, and appeared to particularly enjoy hearing other residents sing and lead songs. As the sessions continued, a sense of comfort and camaraderie was created among the group. Developing knowledge of the residents' likes, dislikes and personality traits, allowed the researchers to tailor their experience. For example, one resident would often start sessions feeling anxious and unsure. As the researchers became more familiar with this resident, they would seat them next to one of their close friends, which resulted in the resident becoming comfortable, engaged, and jovial.

One particular resident who no longer spoke English, seemed to often be 'lost' inside her own head; while she had been present at the sessions, she had not actively participated. She 'awoke' during one of the later sessions with the song 'Que Sera Sera', smiled, started to sing along, took the facilitator's hands, and began to move and 'dance' to the song in her chair. During the next song she rose from her chair, approached one of the researchers (AG) who was observing the session, took her by the hands, raised her out of her own chair and began to dance. Another resident responded strongly to 'Now is the Hour', singing a harmony part loudly as everyone else sang the tune. For another resident, the song 'That's Amore' was particularly enjoyable; he would stand up to lead the song for the whole group.

Finally, the improvement in residents' mood on the days corresponding with the pre- and post-session mood data was often clearly observed by the researchers. For example, on one day (session 6) it was particularly dark and cloudy outside, and the mood of residents improved dramatically with the intervention of the singing session. This observed change in mood was also noted by one of the family and community members who attended that particular day in their interview.

3.3.3.1. Impact on participant-researchers' wellbeing. The researchers experienced some unexpected consequences of their own participation in the sessions. One of these was the change in the researchers' attitude towards their own participation in singing. For example, one researcher (AG) expressed a personal discomfort with singing in public, and consequently expected not to participate in the singing during sessions. However, they found themselves interacting and singing with residents; commenting later that the intent of the approach was not about the technical quality of the *singing*, but instead the quality of the *interactions*, catalysed by the act of singing together. Additionally, researchers self-reported an improvement in their own mood after the sessions and feeling a sense of emotional warmth towards the residents.

4. Discussion

Overall, the study findings indicate that the MEP was acceptable in this single setting evaluation study and showed some evidence of effectiveness at reducing symptoms of depression and improving current emotional wellbeing after the sessions within care home residents with Alzheimer's and dementia. However, although viewed as being highly beneficial to both residents and staff, the program was not seen as being sustainable without external support by all staff at the residential care home. It is important to note that this study was primarily conducted as a feasibility study; thus, given the study sample size was small and the study highly local, the results may not be generalisable to other populations or settings.

The current study has provided preliminary evidence that the MEP may be effective for reducing symptoms of depression and improving emotional wellbeing in people with Alzheimer's disease and dementia; a finding consistent with previous research on other music programs

(Goris et al., 2016; van der Steen et al., 2017). The main effects on the residents' overall depression scores appeared to be primarily on cyclic function (e.g., sleep patterns), and mood (e.g., anxiety, depression). A possible mechanism for this is while improving mood, as noted by the staff and the family and community members, the calmness induced by the program may have influenced other important physiological occupations such as sleep. In addition, the report by one staff member responsible for overseeing resident care that the use of PRN medication did not increase during the study is consistent with physician views on increasing recreational activities for people with dementia to reduce this type of medication (Commonwealth of Australia, 2019). A previous systematic review on non-pharmacological interventions for improving agitation noted that music therapy was immediately effective for reducing agitation but had no long-term effects (Livingston et al., 2014).

It is proposed that music and social singing be incorporated into daily life (Hammar, Emami, Gotell, & Engstrom, 2011), and form part of the training and care management protocols for residential care homes. This has been described previously as "music therapeutic caregiving" (Hammar et al., 2011), with research finding a significant reduction in aggressive behaviours compared with usual care while carers assist the person with activities of daily living such as dressing or bathing. It is also critical to note that part of the effect found for the MEP may be attributed to the songs being recognisable to residents. The songs selected at each session were deliberately selected, yet flexible and evolved over the course of the program depending on resident preferences (see Appendix B in Supplementary materials). Thus, choosing songs that are likely to be familiar for music therapeutic caregiving may also be important.

The emotional wellbeing of the residents recorded prior to each session was generally average to high, which was described by staff as not being typical for residents. As identified by staff, it is likely that the residents' mood may have improved being in the presence of the MEP facilitator and the researchers, and in anticipation of the program. In addition, the researchers noted that the sessions where significant improvement did occur tended to happen on days where general mood was lower prior to the session, such as the session with poor weather. Low light is known to have an impact on mood (Blume, Garbaza, & Spitschan, 2019); thus, this suggests that the program could be used as a preventative measure where external influences are contributing to low mood, such as weather.

The social and interactive nature of the program was noted as being important by family and community members and residential care home staff. Residents' lucidity and increased ability to socialise, which was particularly identified by the family and community members, has potential to improve relationships for residents with their relatives and friends. Possible mechanisms for the increased cognitive capacity have been proposed to occur due to the music itself, or increased arousal experienced by the residents (Simmons-Stern, Budson, & Ally, 2010). While pre-recorded music can improve symptoms of dementia (Garrido et al., 2017), the social interaction as the central tenet of programs such as the MEP may have additional benefits for staff, their family members, and residents, and should not be overlooked.

Despite not requiring any special equipment or skills, the current study found that the staff felt they were unable to continue providing the MEP in this format without the support of an MEP facilitator. They felt that a lack of time and scheduling issues preventing commitment to regular activities were the largest barriers to implementing the program with existing staff. Lacking time to complete duties is likely caused by known problems such as staff shortages in aged residential care (Montague, Burgess, & Connell, 2015). The Royal Commission into Aged Care in Australia has also documented the perspectives of people living in aged care, who have reported that there are insufficient activities or leisure occupations for people living in residential care homes (Commonwealth of Australia, 2019). This could reflect staff shortages, or a lack of emphasis on providing these activities. Given anticipated increases in the number of people requiring residential care into the future, improving the quality and quantity of staff in this workforce is

crucial. In addition, perhaps challenging some of the attitudes towards delivering these types of programs (e.g., feeling like singing voice is inadequate, activity is not a priority compared to other tasks), and training that emphasises the potential positive outcomes on staff morale and subsequent resident mood and behaviour may also assist. The MEP has a long-established training approach for generalist primary school teachers (Pike, 2016), who, like care facility staff, are time-poor, lack confidence in singing, and are subject to work-related stress (Garrett, 2019). The MEP teacher training model encourages the use of music within the daily functioning of the classroom to support a range of learning, social and wellbeing outcomes for themselves and their students (West, 2009a). This approach is also applicable to care facilities, where embedding musical engagement as a part of daily care has been shown to be beneficial for both residents and staff (Hammar, Emami, Engstrom, & Gotell, 2010).

4.1. Limitations

The current study describes pre-post pilot methodology in a small sample, which limits its generalisability. However, this approach was appropriate for determining feasibility, which was the main aim of the current study. A specific limitation is that the general emotional wellbeing of the residents recorded prior to each session was typically higher than normal, meaning there was little room for improvement after the sessions. Additionally, the staff, and family and community members may not have felt comfortable to provide honest and open responses about the MEP, they may also have felt compelled to give overly positive feedback, particularly as many of them noted they wished for the program to continue. To attempt to mitigate this potential bias, the researcher conducting the interviews (NK) specifically emphasised that any negative feedback was important and would be very helpful for the improvement of the program. Finally, while the Cornell scores demonstrated a reduction at post-intervention, it is possible that differences could be due to the different raters. Notably, the items scored as “unable to rate” were reduced at post-intervention potentially reflecting a difference between raters. Given the demands placed on the staff, the researchers did not ask the staff to conduct further testing to establish an inter-rater reliability score. In addition, the raters were not blinded to the program, and this may have influenced their view of residents’ behaviour. Both these issues raise important issues about the validity of the depression data collected; thus, these results should be viewed with caution. However, a strength of the study is the multiple data collection methods and evaluation of the feasibility and sustainability in a real-world setting.

4.2. Lessons learned

It is becoming important in the field of evaluation design that in addition to outcomes for health interventions, other processes related to program implementation, and contextual factors that may increase or decrease the effectiveness of the intervention are also examined (Douglas, Gray, & van Teijlingen, 2010). This focus on assessing other factors including context also aligns with the theory-driven evaluation approach. Whilst it is acknowledged that the results of the current study may not be generalisable to other settings, it is also essential to consider what factors in this context may have contributed to the outcomes. For example, because they knew how much residents enjoyed the program, staff were generally very enthusiastic and helpful in assisting residents to attend sessions, which may have improved uptake of the program. Another factor which may have impacted on the results in this study was that the MEP facilitators were mostly young people, which staff remarked was a factor to which residents usually respond positively. Finally, the space that the MEP sessions were held in was a thoroughfare and not in a closed off room. This may have increased uptake by residents as they could hear the music from their rooms and may have been encouraged by this to participate; equally, this may have contributed to

some residents having difficulty engaging in the program as there was other noise and activity in this area, including staff walking through to other areas of the care home.

There are multiple difficulties in conducting evaluations in real life settings; there were some issues in data collection from staff that should be considered for similar future research. For example, the Cornell assessments must be carried out by someone who closely observes the individual; thus, this cannot be an external researcher. While the residential care home staff in the current study were extremely generous in their donation of time to conduct assessments, it is important to consider that this is a significant request of an already over-burdened workforce. The researchers also recommend for future research that someone not associated with the program should, if possible, administer any pre-session measure prior to the research staff arriving. As identified by staff, the residents’ mood was uplifted prior to the singing program commencing and likely caused the inflation of pre-session measures of emotional wellbeing.

4.3. Conclusion

This pilot study provides encouraging preliminary evidence for the MEP in improving mental health and wellbeing in people with Alzheimer’s disease and dementia. The program was acceptable, although not considered sustainable without assistance from outside the residential care home. Despite limitations around the reduction in depression symptoms caused by different staff rating residents on the Cornell scale, the observations of staff and family members demonstrate significant mutual benefits gained from the program. Further studies are clearly needed to demonstrate the effects of the MEP on the long-term wellbeing and mental health of care home residents with Alzheimer’s and dementia.

Funding

This project is partly supported by a 2017 Excellence in Population Health Research Award, Research School of Population Health, The Australian National University (ANU), and partly supported by funding provided by ACT Health for ACACIA: The ACT Consumer and Carer Mental Health Research Unit. The project is also supported by in-kind resources from the Centre for Mental Health Research, Research School of Population Health, ANU. The lead author (AG) can disseminate the results of this trial without the express permission of the funding bodies. MB is supported by MRFF Fellowship 1150698.

CRedit authorship contribution statement

X1: Conceptualisation, Methodology, Formal analysis, Investigation, Writing – Original Draft, Visualisation, Supervision, Funding acquisition. **X3:** Conceptualisation, Investigation, Resources, Project administration. **X5:** Methodology, Supervision. **X6:** Methodology, Formal analysis. **X2:** Methodology, Investigation, Data curation, Project administration. **X7:** Conceptualisation. **X8:** Funding Acquisition. **X9:** Methodology. **X4:** Conceptualisation, Resources. **Note:** All authors were involved in Writing – Review and Editing and approved of the final manuscript.

Declaration of Competing Interest

Author GP delivered the MEP at the residential care home, and GP and SW were prior conveners of the MEP at ANU. However, to preserve the impartiality of the study evaluation, neither author was involved in data collection, or analysis.

Acknowledgements

We would like to thank the residential aged-care home and its

broadier community, all residents, family and community members, and staff who participated in the evaluation.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.evalprogplan.2021.101930>.

References

- Alexopoulos, G. S., Abrams, R. C., Young, R. C., & Shamoian, C. A. (1988). Cornell Scale for Depression in Dementia. *Biological Psychiatry*, 23, 271–284.
- Alzheimer's Disease International. (2018). *World Alzheimer Report 2018 - The state of the art of dementia research* (pp. 1–48). London: New frontiers, Publishing.
- Aspden, T., Bradshaw, S. A., Playford, E. D., & Riaz, A. (2014). Quality-of-life measures for use within care homes: A systematic review of their measurement properties. *Age and Ageing*, 43, 596–603.
- Baird, A., & Samson, S. (2015). Music and dementia. *Progress in Brain Research*, 217, 207–235.
- Blume, C., Garbaza, C., & Spitschan, M. (2019). Effects of light on human circadian rhythms, sleep and mood. *Somnologie: Schlaforschung und Schlafmedizin = Somnology: Sleep Research and Sleep Medicine*, 23, 147–156.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3.
- Chen, H. T. (2012). Theory-driven evaluation: Conceptual framework, application and advancement. In R. Strobl, O. Lobermeier, & W. Heitmeyer (Eds.), *Evaluation von Programmen und Projekten für eine demokratische Kultur* (pp. 17–40). Publishing, Wiesbaden.
- Commonwealth of Australia. (2019). In Australia, C. o (Ed.), *Royal commission into aged care quality and safety. Interim report: Neglect. Vol. 2. Hearing overviews and case studies*. Publishing, Canberra, Australia.
- Davison, T. E., Hudson, C., McCabe, M. P., George, K., & Buchanan, G. (2007). An individualized psychosocial approach for “treatment resistant” behavioral symptoms of dementia among aged care residents. *International Psychogeriatrics*, 19, 859–873.
- Douglas, F. C. G., Gray, D. A., & van Teijlingen, E. R. (2010). Using a realist approach to evaluate smoking cessation interventions targeting pregnant women and young people. *BMC Health Services Research*, 10, 49–49.
- Eldridge, S. M., Chan, C. L., Campbell, M. J., Bond, C. M., Hopewell, S., Thabane, L., et al. (2016). CONSORT 2010 statement: Extension to randomised pilot and feasibility trials. *BMJ*, 355, i5239.
- Ettema, T. P., Hensen, E., De Lange, J., Droes, R. M., Mellenbergh, G. J., & Ribbe, M. W. (2007). Self report on quality of life in dementia with modified COOP/WONCA charts. *Ageing & Mental Health*, 11, 734–742.
- Garrett, B. (2019). Confronting the challenge: The impact of whole-school primary music on generalist teachers' motivation and engagement. *Research Studies in Music Education*, 41, 219–235.
- Garrido, S., Dunne, L., Chang, E., Perz, J., Stevens, C. J., & Haertsch, M. (2017). The use of music playlists for people with dementia: A critical synthesis. *Journal of Alzheimers Disease*, 60, 1129–1142.
- Goris, E., Ansel, K., & Schutte, D. (2016). Quantitative systematic review of the effects of non-pharmacological interventions on reducing apathy in persons with dementia. *Journal of Advanced Nursing*, 72(11), 2612–262.
- Gulliver, A., Pike, G., Banfield, M., Morse, A. R., Katruss, N., Pescud, M., et al. (2019). Evaluation of the Music Engagement Program for people with Alzheimer's disease and dementia: Study protocol for a pilot trial. *Contemporary Clinical Trials Communications*, 15, Article 100419.
- Hammar, L. M., Emami, A., Engstrom, G., & Gotell, E. (2010). Reactions of persons with dementia to caregivers singing in morning care situations. *The Open Nursing Journal*, 4, 35–41.
- Hammar, L. M., Emami, A., Gotell, E., & Engstrom, G. (2011). The impact of caregivers' singing on expressions of emotion and resistance during morning care situations in persons with dementia: An intervention in dementia care. *Journal of Clinical Nursing*, 20, 969–978.
- Jeon, Y. H., Li, Z. C., Low, L. F., Chenoweth, L., O'Connor, D., Beattie, E., et al. (2015). The clinical utility of the Cornell Scale for Depression in Dementia as a routine assessment in nursing homes. *The American Journal of Geriatric Psychiatry: Official Journal of the American Association for Geriatric Psychiatry*, 23, 784–793.
- Koelsch, S. (2014). Brain correlates of music-evoked emotions. *Nature Reviews Neuroscience*, 15, 170–180.
- Korner, A., Lauritzen, L., Abelskov, K., Gulmann, N., Brodersen, A. M., Wedervang, T., et al. (2006). The geriatric depression scale and the Cornell Scale for Depression in Dementia. A validity study. *Nordic Journal of Psychiatry*, 60.
- Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: A practical primer for t-tests and ANOVAs. *Frontiers in Psychology*, 4.
- Leggieri, M., Thaut, M. H., Fornazzari, L., Schweizer, T. A., Barfett, J., Munoz, D. G., et al. (2019). Music intervention approaches for alzheimer's disease: A review of the literature. *Frontiers in Neuroscience*, 13.
- Lennon, O. C., Carey, A., Creed, A., Durcan, S., & Blake, C. (2011). Reliability and validity of COOP/WONCA functional health status charts for stroke patients in primary care. *Journal of Stroke and Cerebrovascular Diseases*, 20, 465–473.
- Livingston, G., Kelly, L., Lewis-Holmes, E., Baio, G., Morris, S., Patel, N., et al. (2014). Non-pharmacological interventions for agitation in dementia: Systematic review of randomised controlled trials. *The British Journal of Psychiatry: the Journal of Mental Science*, 205, 436–442.
- Low, J. (2013). Unstructured and semi-structured interviews in health research. In M. Saks, & J. Allsop (Eds.), *Researching health: Qualitative, quantitative and mixed methods* (pp. 87–105). Publishing, London, UK.
- McCabe, M. P., Davison, T. E., & George, K. (2007). Effectiveness of staff training programs for behavioral problems among older people with dementia. *Ageing & Mental Health*, 11, 505–519.
- McCabe, M. P., Mellor, D., Davison, T. E., Karantzas, G., von Treuer, K., & O'Connor, D. W. (2013). A study protocol to investigate the management of depression and challenging behaviors associated with dementia in aged care settings. *BMC Geriatrics*, 13, 95.
- McDermott, O., Crellin, N., Ridder, H. M., & Orrell, M. (2013). Music therapy in dementia: A narrative synthesis systematic review. *International Journal of Geriatric Psychiatry*, 28, 781–794.
- McDermott, O., Orrell, M., & Ridder, H. M. (2014). The importance of music for people with dementia: The perspectives of people with dementia, family carers, staff and music therapists. *Ageing & Mental Health*, 18, 706–716.
- McKhann, G. M., Knopman, D. S., Chertkow, H., Hyman, B. T., Jack, C. R., Jr., Kawas, C. H., et al. (2011). The diagnosis of dementia due to Alzheimer's disease: Recommendations from the National Institute on Aging-Alzheimer's Association workgroups on diagnostic guidelines for Alzheimer's disease. *Alzheimer's & Dementia: the Journal of the Alzheimer's Association*, 7, 263–269.
- Modrego, P. J. (2010). Depression in Alzheimer's disease. Pathophysiology, diagnosis, and treatment. *Journal of Alzheimers Disease*, 21.
- Montague, A., Burgess, J., & Connell, J. (2015). Attracting and retaining Australia's aged care workers: Developing policy and organisational responses. *Labour & Industry A Journal of the Social and Economic Relations of Work*, 25, 293–305.
- Nolte, A. G., Downing, C., Temane, A., & Hastings-Tolsma, M. (2017). Compassion fatigue in nurses: A metasynthesis. *Journal of Clinical Nursing*, 26, 4364–4378.
- Pike, G. (2016). *The past, present and future of music in education: A transdisciplinary framework designed to promote re-engagement and reform in music education for teachers, students and the community* (Order No. 10758311). Publishing.
- Politis, A. M., Vozzella, S., Mayer, L. S., Onyike, C. U., Baker, A. S., & Lyketsos, C. G. (2004). A randomized, controlled, clinical trial of activity therapy for apathy in patients with dementia residing in long-term care. *International Journal of Geriatric Psychiatry*, 19, 1087–1094.
- Portugal, M. G., Coutinho, E. S., Almeida, C., Barca, M. L., Knapskog, A. B., Engedal, K., et al. (2012). Validation of Montgomery-Asberg rating scale and Cornell Scale for Depression in Dementia in Brazilian elderly patients. *International Psychogeriatrics*, 24, 1291–1298.
- Prince, M., Bryce, R., Albanese, E., Wimo, A., Ribeiro, W., & Ferri, C. P. (2013). The global prevalence of dementia: A systematic review and metaanalysis. *Alzheimer's & Dementia*, 9(63-75), e62.
- Resnick, B., Gruber-Baldini, A. L., Pretzer-Aboff, I., Galik, E., Buie, V. C., Russ, K., et al. (2007). Reliability and validity of the evaluation to sign consent measure. *The Gerontologist*, 47, 69–77.
- Ridder, H., & Gummessen, E. (2015). The use of extemporizing in music therapy to facilitate communication in a person with dementia: An explorative case study. *The Australian Journal of Music Therapy*, 26, 3–25.
- Simmons-Stern, N. R., Budson, A. E., & Ally, B. A. (2010). Music as a memory enhancer in patients with Alzheimer's disease. *Neuropsychologia*, 48, 3164–3167.
- Trivedi, D. P., Braun, A., Dickinson, A., Gage, H., Hamilton, L., Goodman, C., et al. (2018). Managing behavioural and psychological symptoms in community dwelling older people with dementia: 1. A systematic review of the effectiveness of interventions. *Dementia*, 18, 2925–2949.
- Twisk, J. W. R. (2003). *Applied longitudinal data analysis for epidemiology: A practical guide*. New York: Cambridge University Press.
- van der Steen, J. T., van Soest-Poortvliet, M. C., van der Wouden, J. C., Bruinsma, M. S., Scholten, R. J., & Vink, A. C. (2017). Music-based therapeutic interventions for people with dementia. *The Cochrane Database of Systematic Reviews*, 5, Article CD003477.
- West, S. (2009a). The Australian National University Music Education Programme: Developing a new approach to ongoing engagement in music making for all ages. *International Journal of Community Music*, 2, 241–254.
- West, S. (2009b). Passing it on: Disseminating and evaluating the theory and practice of the music education program. *The Second International Conference on Music Communication Science*. Publishing.
- Wongpakaran, N., & Wongpakaran, T. (2013). Cornell Scale for Depression in Dementia: Study of residents in a northern Thai long-term care home. *Psychiatry Investigation*, 10, 359–364.

Dr Amelia Gulliver is Research Fellow with the ACACIA team at the Centre for Mental Health Research at the Australian National University. She works on various projects relevant to, and working towards the benefit of people with lived experience of mental health issues. She has expertise in the areas of help-seeking for mental health problems, e-mental health program development and evaluation, and elite athlete and university student mental health.

Dr Georgia Pike is a visiting fellow at the Centre for Mental Health Research at the Australian National University. Her research focusses on the interdisciplinary space of music, community and wellbeing. With a background in the Arts, Education and the Humanities, she regularly collaborates with researchers and practitioners in mental health, ageing, occupational therapy, education and medicine.

Dr Michelle Banfield is an Associate Professor and head of Lived Experience Research at the Centre for Mental Health Research at the Australian National University. Her research interests include the incorporation of experiential knowledge in health services and system reform, particularly focused on the active involvement of people with lived experience.

Alyssa R. Morse is a Postdoctoral Fellow at the Centre for Mental Health Research at The Australian National University. Her research interests include lived experience involvement in research, health services and health policy; empathy, social support, social strain, their biological basis and their impacts on health and wellbeing; and mental health service/intervention design and evaluation.

Natasha Katruss is a Research Assistant at the Centre for Mental Health Research at the Australian National University. Her research experience includes e-mental health program development and evaluation, suicide and dementia prevention, and consumer and carer research of people living with Alzheimer's disease and Dementia.

Harley Valerius is an Occupational Therapist currently working in early intervention at Noah's Ark Inc. in Canberra, Australia. He has experience working with a wide range of clients, from children to older adults, in engagement in meaningful occupation. Harley has worked collaboratively with the Music Engagement Program during his time at university, examining at the MEP through an occupational lens.

Dr Melanie Pescud is a Fellow at the School of Regulation and Global Governance (RegNet) at the Australian National University. She is currently co-leading an Australian Prevention Partnership Centre funded project into the use and impact of systems approaches to chronic disease prevention. Melanie's primary research areas are systems thinking for healthy public policy, arts and health, workplace health, Indigenous wellbeing, and food and nutrition policy.

Mitchell McMaster is currently completing his PhD at the Centre for Research on Ageing, Health, and Wellbeing. He has previously worked as an RCT Manager at the NHMRC Centre for Research Excellence in Cognitive Health and as a Project Manager at the Dementia Collaborative Research Centre. Mitchell's primary research areas are: dementia prevention/risk reduction and maximising quality of life for people with moderate to severe dementia.

Susan West is an Adjunct Professor at Charles Sturt University, and has over forty years' experience as a performer, educator, composer and arranger. Her work in developing pre-tertiary music programs and post-graduate teacher-training is at the cutting edge of music education with wide-ranging influences from traditional music philosophies, both ancient and modern, to holistic and therapeutic uses of music.